

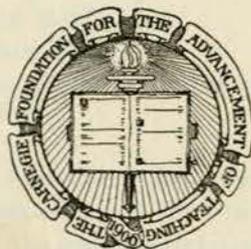
DENTAL EDUCATION
IN THE UNITED STATES AND CANADA

A REPORT TO THE CARNEGIE FOUNDATION
FOR THE ADVANCEMENT OF TEACHING

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WITH A PREFACE BY HENRY S. PRITCHETT
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PREFACE

THE present report on Dental Education in the United States and Canada is an outgrowth of the study on Medical Education published by the Carnegie Foundation in 1910. Since that time the progress and the development of medical education have been dealt with in various annual reports of the Foundation. The cause of medical education likewise has had continuous study and generous support from the General Education Board and the Rockefeller Foundation. The medical profession itself through its organizations, and particularly through the Council on Medical Education of the American Medical Association, has maintained a constant scrutiny of medical schools and of standards of medical education. The outcome of all these efforts has been a notable advance in the quality of medical schools, in the facilities for medical education, and in the preliminary training of men for the medical profession. In 1910 there were 155 medical schools in English-speaking North America, for no line separates the medical interests of the United States and the Dominion. In 1925 there were 88 medical schools in the two countries, 79 in the United States and 9 in Canada. Those in the United States have been graded by the Council of the American Medical Association upon certain adopted criteria into three groups, A, B, and C, there being 70 schools of Class A, 3 of Class B, and 6 of Class C.¹ The artificial character of this classification was pointed out in the Ninth Report of the Foundation. It is illustrated by the widely divergent and somewhat incongruous group of schools that compose Class A. That this attempt at standardization has served to eliminate the more unworthy schools, as well as to enlarge greatly the facilities and to strengthen the sincerity of those that remain is clear. The weakness of the classification lies in the fact that it does little to advance the quality of medical teaching and the adaptation of the medical curriculum to the end it is intended to serve. Like the engineering school, the medical school undertakes to develop out of certain fundamental sciences the theory and practice of a highly differentiated profession. The process by which these underlying sciences are to be related

¹ The Medical Department of the University of Rochester is not included. It began its first session September 17, 1925.

to their applications is not entirely simple. In the medical school anatomy, bacteriology, chemistry, pharmacology, physiology, pathology, tend to become separate and distinct studies just as in the engineering school mathematics, physics, chemistry, and mechanics tend to become unrelated studies instead of the common soil out of which the theory and practice of engineering rise by a natural growth.

The matter is still further complicated both in the medical school and in the engineering school by the effort to train men for numerous specialties of practice that have arisen out of the advances of the last fifty years. To offer in the period of four years a course in medicine that shall teach the fundamental sciences, and upon this foundation give the student a sound training in the general practice of medicine and surgery, and at the same time prepare a certain proportion of the student body for the practice of various specialties in medicine and surgery, is fast becoming an impossible educational task. The first and fundamental step is an integration of the medical course of study in such fashion that the so-called fundamental studies shall become part of a course in medical theory and practice. A large amount of time is now consumed in teaching to medical students redundant details of anatomy, of physiology, of chemistry, which they quickly forget and which the teachers do not long remember. These details ought to come to medical students as matters of illustration and experience in the course of their medical study. This is a problem of education, not of medicine. It is the most important problem which confronts the modern medical school.

In the complex task of seeking to teach to a group of young men, in four years, split into many units of time, these fundamental sciences, the theory and practice of general medicine, and the medical specialties, it was inevitable that certain specialties should be underrated in the medical school and others lost to view. The most notable of the omissions has been the absence of a specialty in medicine relating to diseases of the mouth. This has been due mainly to two causes.

In the first place, only in recent years has it been fully recognized that dental disorders are directly related to the general health. This is reflected in the medical school curriculum. Of the 79 medical schools in the United States, only 9 in 1924-25 included required courses in oral hygiene, oral surgery, or clinical dentistry in the undergraduate instruc-

tion, and these were not comparable to the courses offered with respect to other special fields, for example, diseases of the throat, nose, eye, and ear.

In the second place, the unusual mechanical requirements made upon the practitioner who undertakes to deal with the abnormalities and defects of the teeth, and the fact that the functional parts of the teeth may be replaced, established the almost universal opinion, even among physicians, that dentistry was a mechanical art of restoration and not a branch of medicine.

Out of this situation has arisen the profession of dentistry as practised to-day by a large body of professional men who are not included in the medical profession, notwithstanding the fact that the teeth and mouth constitute one of the most important fields of medicine.

This anomaly was fully recognized when the Carnegie Foundation issued its report on medical education, in 1910. At that time it did not seem possible to deal with the question of dental education without larger knowledge than was then available. In particular it was not then clear whether dentistry ought to become a specialty of the conventional medical practice, or whether it should remain a field of practice for a separate body of practitioners. This question is entirely independent of the obligation of the medical school to give to all medical students fundamental instruction in oral hygiene and clinical dentistry. Of this there can be no doubt in the mind of one familiar with the subject.

The present report is therefore an effort to do for dental education, as it now exists, the same service that the Foundation undertook to perform for medical education—to survey the field, to state the essential facts as they exist to-day, and to seek to draw such conclusions as may be helpful to those who are concerned with medical and dental education in the United States and the Dominion. It is to be borne in mind always that this is an educational report, not a technical study of either medicine or dentistry.

The study has been carried out by Dr. Gies with an open mind and with the single desire to be of service to the cause of professional education. It has taken five years to complete the work. This has been due not only to the need to obtain exact facts, but also to the long and patient effort that Dr. Gies has made to understand the situation and to advise

with the dental profession. No study of this character has ever been made in which there has been so complete coöperation on the part of the profession itself. The national associations of examiners, of practitioners, and of teachers, the national councils on dental education and the dental schools, both in the United States and in Canada, have all lent themselves to this study in a sincere and patient effort to bring out a helpful and wise conclusion. The report is no less suggestive and interesting to practitioners and teachers of medicine than to those of dentistry. To understand the long process of study and conference through which Dr. Gies has gone, the report itself and the complete statistical information given in Part VI and the Appendix must be studied. I call attention to a few conclusions that are significant both for medicine and for dentistry.

1. Dentistry is an important branch of health service and cannot longer be ignored in the training of general practitioners of medicine.
2. The practice of dentistry cannot now be made a specialty of the conventional practice of medicine, but should remain a health service of equal recognition with other specialties of medicine. Antagonism between medicine and dentistry is unworthy of both and has no justifiable basis from the standpoint either of scientific progress or of the public interest. Both medicine and dentistry, considered as professions, are agencies for health service and can render that service only by coöperation.
3. The profession of dentistry, in order to discharge its obligations in the matter of oral health-service, must require for entrance to the profession such equipment in preliminary education as will prepare the candidate for professional study, and must also offer in the dental curriculum training in the medical sciences, in dental technology, in clinical dentistry, and in oral medicine, such as will afford a sound basis for the general practice of dentistry. The courses of study must recognize the fact that the general practice of dentistry includes training both in oral medicine and in dental technology.
4. The practice of health service as applied to the teeth and the adjacent tissues cannot be divided between stomatologists as prescribers, on the one hand, and dental technicians as mechanical ex-

perts, on the other, in a manner analogous to this distribution of duties between the oculist and the optician; for the reason that the actual practice of dentistry must be in the mouth itself and requires a union of medical knowledge, tactual skill, and mechanical precision not called for in other specialties of medicine.

5. The report recommends that in order to meet this situation the candidate for the dental profession should have at least two pre-professional years of college study.
6. To take full advantage of this requirement, the report recommends a complete reorganization of the undergraduate curriculum of the dental school. It proposes three¹ years for the undergraduate curriculum instead of four, in which to cover intensive training in oral medicine, clinical dentistry, and dental technology.
7. Optional full-year graduate curricula, based on the three-year undergraduate curriculum, for the systematic training of various types of oral specialization including teaching and research.
8. The establishment of combined dental and medical courses, in cooperation with suitable dispensaries and hospitals, for medical and dental training of specialists in oral surgery, public health service, dental research, and in other subjects in the field common to both medical and dental practice.

The report contains specific suggestions relative to library and research facilities, graduate work, and the relation of the dental school to the university. These recommendations contemplate a complete revision of dental teaching.

It should be clearly understood that the proposal to reduce the course for general practitioners in dentistry to three years instead of four is not a step backward. It is an honest and sincere effort, first to secure educated men for the profession and secondly to integrate the professional course for general dentistry into a feasible and effective process of professional training. Under this arrangement a better educated man will devote more hours in three years to direct preparation for his profession than are now given in four years by men generally less highly educated.

¹It may be desirable to lengthen the school year to ten months instead of eight, each year to be lengthened only where it may be necessary for special local reasons or to meet rigid statutory requirements in hours—a minimum of 4000 in New York, for example.

The plan seeks to integrate the scientific and technical studies of the dental school. It proposes, in addition, to offer the dental specialties in one or more graduate years.

This effort ought to be of the greatest possible interest to members of the medical profession and teachers in medical schools. The reorganization of the dental school curriculum as here proposed rests on two assumptions: first that the completion of two years in the typical American college affords the best preparation available at present for a scientific profession; secondly that upon such foundation the dental curriculum can be so constructed as to furnish in three years an adequate training for the general practice of the profession of dentistry.

The professional school cannot do otherwise than accept the work of the secondary school and the college as its foundation. It remains for those who direct these schools of cultural education to maintain their effectiveness as intellectual agencies.

The process of integration of the dental curriculum must obviously be one of experimentation. It is comparatively simple to offer a course in anatomy or chemistry. It is quite another matter to make these studies a fruitful part of a dental or medical curriculum. The student is not so much concerned in chemistry *qua* chemistry, as in the fitting of his chemical knowledge and training into his preparation for either profession. To this end he must have certain elementary chemical concepts in his grasp, but the application of them is possible only when his chemistry goes *pari passu* with his clinical training. To have in one compartment anatomy, in another physics, in still a third chemistry, means little in the study of any scientific profession.

The report lays emphasis on the relations between medicine and dentistry and their intimate mutual interest as servants of the public health. The essential need of both is intelligent study of the existing process of education and the adaptation of the professional schools—whether of medicine or of dentistry—to the training of qualified practitioners. For this purpose these schools exist. The cause of scientific research in these fields will be best served if this primary obligation is kept always in view. The immediate and direct obligation upon both the medical school and the dental school is to reëxamine the courses of study and to convert them into effective agencies for the training of those who are

to make their professions in the service of the public health. Such a training for the modern practitioner of dentistry can be had only in a school that relates itself intelligently to the cultural education offered in high school and college, to the medical school, and to adequate understanding of the part played by scientific nursing.

It is generally understood and recognized that the day of the commercial dental school, like that of the commercial medical school, has passed. This report has not sought to dwell on the commercial character of existing dental education. As was the case in medicine fifteen years ago, some of the most indefensible of these commercial courses in dentistry have been given under the authority of institutions of higher learning. It may be safely assumed that no university will to-day attempt the conduct of a dental school on a commercial basis. The report has sought to focus the attention of those concerned with the subject upon constructive measures rather than upon past failings.

In conclusion I cannot too strongly urge the importance of adequate financial support for dental schools. They stand, in this respect, in much the same situation as the medical schools stood a few years ago. The recommendations made in this report do not contemplate the education of a group of dental practitioners at such a level, whether of training or of the cost of education, as will make the dentist inaccessible to the man of small means. On the contrary, the report aims to secure such a quality of general education and of professional training as is absolutely essential to the safeguarding of public health. It aims at a sincere and adequate ideal of professional life, not at an ideal so costly as to place modern dental service out of the reach of those of modest income. The problems of our social order and the aspirations of members of the present-day democracies alike demand the best service that science can give in medicine, in dentistry, in nursing, and in the whole range of public health service. In order that this may be accomplished, the fruits of modern scientific health service must be within the reach of that great majority of mankind that live upon modest incomes. To train up a generation of physicians, of dentists, of nurses, whose service is so costly as to be out of reach of the self-respecting man of modest means who desires to pay his way would be a dismal mistake in civilization. Yet to train men for public health service and at the same time to keep that service within the reach of the

great body of self-respecting men and women constitutes no simple problem. For its best solution, it will require, no doubt, some form of social coöperation such as diagnostic, surgical, and dental clinics, which shall take into their conferences both the patients and their doctors, and which should make important economies possible through the better organization of the time of the practitioners, and through the common use of expensive equipment and technical personnel. The Carnegie Corporation gave, three years ago, a grant to the Johns Hopkins Medical School to inaugurate such an effort in a building now being constructed to serve the varying needs of patients and their medical advisers. It is a large problem. How to make the gains of modern medicine available to all the members of a modern democracy, how to preserve a high order of professional training and yet furnish such service as only good training can offer to all the members of a community, are problems which present a new challenge to civilization that must be met, as undoubtedly it will be met, by securing the facts, by careful study of the situation, and by sensible and unselfish coöperation among all those who are concerned.

But whatever may be the methods by which the gains of scientific research in health are brought within the reach of the general body of citizens, we do know that the first step in the process is to train a qualified body of public health servants. The dental school is one of the most important of these agencies. Like the medical school it has long been left to make its way on a commercial basis. To-day under the leadership of the best men in the profession it has set its face resolutely toward high service and honorable standards. The facilities for the education it seeks to offer cannot be furnished on a commercial basis. It must have generous financial help, such as has been accorded in the last ten years to many of our medical schools, if it is to carry out its duty to the public health service. There is to-day no more direct method by which the public health can be served than to enable the universities to place their dental schools in a position to give the kind of education for which the world stands in need. Aid, wisely given to even a few of the more promising schools, will furnish inspiration and incentive sorely needed at this juncture in the cause of dental education.

This study has been conducted under conditions that favored active

participation by a large number of representatives of the dental profession, and its promotion has had the aid and encouragement of all of the dental schools and, in general, of those whose interests have been most directly affected. The advice of numerous teachers of the medical sciences and of clinical medicine, and the collaboration of many students of education in its broadest aspects, have been important influences also in the furtherance of the enquiry. The character and extent of the advantages accruing to the study, as a consequence of these exceptional conditions of coöperation and endorsement, have been indicated at the end of the concluding chapter, where appropriate allusions to the outstanding helpfulness of the Dental Educational Council of America and to the assistance of its Secretary, Dr. Albert L. Midgley, are conspicuous among the acknowledgments of the Foundation's indebtedness and appreciation.

HENRY S. PRITCHETT

January 13, 1926

INTRODUCTION

DENTAL EDUCATION IN THE UNITED STATES AND CANADA

Dentistry began to emerge as a profession in 1810 and 1820, when dentists in the United States established the first journal of dentistry, the first national society of dentists, and the first dental school. The growth of the dental profession, the establishment of dentistry as a recognized medical specialty, and the development of dentistry as a branch of medicine, which was recognized as a specialty in 1917, are some of the milestones in the history of dentistry in the United States. In 1920, the first dental

INTRODUCTION

A. DENTISTRY A HIGHLY MECHANICAL DIVISION OF THE HEALING ART

FROM the earliest periods of human history, the teeth have been subject to irregularity in arrangement, to decay and disintegration, to loosening from their attachments in the jaws, and to partial or complete removal by accident or intent. Among the ancients, desire to preserve teeth, to retain loose teeth, and to disguise dental disfigurement, gave birth to the art of dentistry, which has been traditionally an agency to perfect the mechanism of mastication, induce oral comfort, correct maxillary or palatal deformities, maintain normal vocal enunciation, and enhance facial comeliness. After centuries of cumulative refinement of its methods, dentistry has become, in the main, the art of realigning, repairing, rebuilding, and removing teeth; remedying diseased conditions within teeth and in tissues immediately adjacent to them; and replacing, functionally and esthetically with artificial substitutes, the teeth or parts of teeth that have been lost or removed. The last of these phases long seemed to be the most important utility of the practice of dentistry, which, by reason of its outstanding reconstructive character and its minor evidences of curative quality, appeared to be a specialty of applied mechanics with only an incidental relation to the art of healing. In recent years, dentistry has also been aiming to repel dental and oral diseases, chiefly by improved applications of the mechanical resources of oral hygiene, and by encouraging reliance upon diets that favor normal growth and maintenance of the whole body.

B. DENTISTRY AN INDEPENDENT AND CLOSELY ORGANIZED PROFESSION

Dentistry began to attain importance in 1839 and 1840, when dentists in the United States established the first journal of dentistry, the first national society of dentists, and the first dental school. For nearly three decades thereafter the organization of dentistry in America remained superficial, and there were practically no legal restrictions of its practice, which was regarded generally as a mechanical trade that any one might undertake who was disposed to do so. In 1868, the ten existing

dental schools graduated only about ninety dentists, most of those who then began the practice of dentistry having preferred to learn the art as apprentices in the offices of established dentists. In 1868, in response to cumulative demands for greater responsibility and efficiency in dental service, the legislatures of three states enacted laws that defined dentistry and specified educational requirements for a license to engage in its practice. During the period from 1872 to 1899, this example was followed by the other states individually, and since 1900 such a law has been in force in every state in the Union.

In all of the states of this country and in the provinces of Canada, dentistry and medicine are by law regulated as independent though related professions. Admission to their practice is based on diverse educational requirements, which are exacted for each profession by state or provincial boards of examiners, or equivalent officers representing the people. The courts have interpreted these laws to mean that dentistry and medicine are separate and distinct in fact and in law, and that a dentist is not a physician and a physician is not a dentist.

Dentistry is now a highly organized profession, with about 65,000 practitioners in the United States and 3800 in Canada. In each country there is a national association of dentists; and practically every state or province contains a state or provincial society and many district and local organizations of dental practitioners. The state boards of dental examiners in this country have maintained a national association since 1883. There are forty-four dental schools in the United States and five in Canada, all but eight of which are parts of universities. Representatives of the dental schools in the United States and Canada have supported various general associations of the schools since 1884, and of the teachers since 1893, but in 1923 united these bodies in the American Association of Dental Schools. The Dental Educational Council of America, representing the national organizations of state examiners, of schools and teachers, and of practitioners, performs for dentistry, in the United States, educational functions that are similar to those of the Council on Medical Education and Hospitals of the American Medical Association. The American College of Dentists is analogous to the American College of Surgeons. Dental practitioners of all nations are united in the *Fédération Dentaire Internationale*, and the Seventh International Dental

Congress will be held under its auspices in Philadelphia in August, 1926. The International Association for Dental Research consists of a federation of five research societies in this country and one in Canada. Many of the dental organizations issue periodicals, and a relatively large number of commercial dental journals are published monthly. The dental associations have been conducted in complete independence of the medical bodies. The Section on Stomatology of the American Medical Association, established in 1881 to make the relationship between medicine and dentistry more intimate, was disbanded in May, 1925, chiefly because of lack of medical interest in dentistry. The American Stomatological Association, founded in October, 1924, aims to convert dentistry into a specialty of the practice of conventional medicine, but does not appear to be receiving any marked encouragement from either dentistry or medicine. Owing to failure of both physicians and dentists to recognize the fact that the primary objectives of dentistry and of medicine are identical—to keep people well—there has been very little practical coöperation between bodies representing the two professions.

C. DENTISTRY NOT AN ACCREDITED SPECIALTY OF THE PRACTICE OF MEDICINE

The abnormalities and diseases of such parts of the body as the ear, eye, nose, and throat are everywhere included in the practice of conventional medicine, and are the primary concern of certain of its important specialties. But in Canada and in the United States, as in other countries, the disorders of the teeth have been allotted to dentistry, which has been organized and is now legally defined and regulated as a division of the healing art that is intrinsically different from that of a specialty of medicine. The teeth and their closely adjacent tissues are the only parts of the body that have been thus singled out as a special domain of remedial treatment that may not be formally practised by a physician without a special license.

This exceptional position of dentistry, compared with any of the accredited specialties of the practice of medicine, arose from early recognition of the unusually high degree of digital skill that was required in nearly every act in the realignment or replacement of teeth, and for

their reparative, remedial, or reconstructive treatment. The attainment of this unusual status has been due in large measure, also, to the abiding influence of ancient and mistaken opinions among physicians that, as a rule, dental maladies were wholly local, relatively unimportant in their influence on the general health, and in need of medical attention only when adjacent parts had been involved or deranged so grossly as to make medical or surgical treatment imperative. These erroneous beliefs, which were promoted originally by physicians and which persist among them even now, have been fostered, also, by general misunderstanding of the significance of early medical observations that teeth were almost wholly devoid of the capacity for self-repair; that, usually, dental disorders were not curable with drugs but could be remedied by mechanical means alone; that all of the teeth, whether healthy or diseased, could be broken off or extracted without apparent harmful influence on the jaws or on the welfare of the body as a whole; and that substitutes for the crowns of any number of teeth could be adjusted in the mouth for effectual maintenance of the dental functions. The concurrence of these conditions of incapacity for self-repair, incurability by medicinal treatment, ready recovery from the effects of total loss, and completeness of the functional restoration attainable by artificial replacement, which do not apply collectively to any other part of the body that is supplied with blood and nerves, long seemed an encouragement of medical indifference to the teeth and to dentistry.

As a result of these unfounded assumptions and of such misapprehensions of the import of dental disorders, by physicians for centuries, medicine gave little attention to the health of the teeth. Although the advance of civilization has been accompanied by accentuation of dental abnormalities, medicine persistently ignored the great desirability of careful observation in this field; and, sharing the popular belief that decay of teeth was unpreventable and loss of teeth unavoidable, physicians helped to bring about universal resignation to the supposedly inevitable incidence of dental imperfection and distress. Until recently, medicine viewed this situation with about as much concern as that excited by loss of hair from the scalp, and did little more to understand or to control the influences responsible for the one than for the other. Under these conditions of unconcern and neglect in the practice of

medicine, which reflected the crudity, ignorance, and superstition of its development, the work of repairing or removing teeth, or of preparing and fitting useful substitutes for lost teeth, was considered to be as unimportant medically as that of a barber. A tooth was pulled out or broken off for the relief of toothache, and strength was the only operative requirement. Any one whose special mechanical proclivities induced him to undertake the task might make "false" teeth and fit them in his own way, under any mutually satisfactory conditions, into the mouths of all to whom such substitutes could be sold. As a rule, physicians refrained from attempting to render reparative service of this kind. In the United States, goldsmiths, jewelers, ivory turners, umbrella makers, blacksmiths, mechanics, wig makers, tinkers, engravers, barbers, and itinerant jacks-of-all-trades became the most numerous practitioners of dentistry, which for many years remained a simple trade and a mechanical subsidiary to medicine. It was not until the last century that leading practitioners, men of high ethical standards and enlightened endeavor, raised it to the status of a profession.

After ignorance, commercialism, and charlatany had lowered dentistry so far in public esteem that earnest practitioners in America were finally impelled to act, a few doctors of medicine, who had been concentrating their attention on dental disorders and who had a deeper appreciation than their medical confreres of the relation of the condition of the teeth and mouth to human welfare, coöperated with a number of progressive dentists in efforts to improve the quality of dentistry and to elevate it in public respect by associating it intimately with medicine. They endeavored unsuccessfully to establish instruction in dentistry in schools of medicine, the most important of their proposals to this end having been rejected, by the medical faculty to which it was presented, with the decisive comment that dentistry was not important enough to be taught in a medical school. This historic rebuff, administered in 1839 to earnest physicians and dentists who sought, in effect, to make dentistry a specialty of medicine, did not dishearten them, but diverted their purpose and threw them upon their own resources. With a vision of greater serviceability and higher respectability for dental practice, they determined that, if dentistry could not be taught in medical schools, it should be given a suitable educational foundation in independent colleges.

Accordingly, in 1840 in Baltimore, they established the original dental school, which began promptly to give instruction leading to the degree of Doctor of Dental Surgery (D.D.S.), and graduated two students in 1841. Since 1840 formal instruction in dentistry has been conducted in this country independently of medical education without objection from medicine and with little complaint from dentistry.

The desirability of teaching the medical sciences to students of dentistry was appreciated by the pioneers in dental education, and such instruction has been given in all dental schools; but dentistry's realization of its need for the medical sciences has never been keen enough to give to that instruction the quality it bears in medical education, or to impart to dentistry the character of a specialty of the practice of medicine. Growing need for laboratory facilities to improve the instruction of dental students in the medical sciences has induced administrative officers, in most of the universities containing both medical and dental schools, to bring about affiliations between these schools in order to prevent avoidable waste from unnecessary duplication of teaching resources. Yet such affiliations, which commonly take the form of instruction of dental students in laboratories in the medical buildings, have not been expressive of any desire or tendency anywhere to make dentistry a specialty of the practice of medicine. On the contrary, as a result of traditional antagonism, these adjustments having been effected in most instances in the face of spirited resistance from the medical or the dental faculties concerned, continue to be more or less unwelcome to one or both groups of teachers. As an outcome of this lack of understanding and accord, medical faculties are often frankly indifferent to the conditions or the quality of the instruction given in their laboratories to dental students. In turn, dental faculties, which usually have little more than a perfunctory interest in instruction in the medical sciences, commonly make the best of such awkward situations as guests of medical faculties, by submitting to what they cannot avoid. The burden of the public disservice that arises from this state of affairs clearly rests upon the shoulders of the medical faculties.

Another indication of the uncompromising independence of dentistry and medicine is the fact that, although the medical schools in this country and in Canada require prospective general practitioners to take formal

courses in the common features of such specialties of medical practice as oto-laryngology, rhinology, ophthalmology, and dermatology, with few exceptions they ignore oral hygiene and clinical dentistry, as though all phases of stomatology were unimportant in the careful practice of medicine. Most of the medical schools, inattentive to the relation of dental disorders to the inauguration and progress of various diseases in other parts of the body, fail to emphasize even the general association between dental maladies and those of the closely related medical specialties; make no provision for effective instruction in surgery on the borderline between dentistry and medicine; exclude clinical dentistry from their dispensaries and hospitals; and do not recognize dental service in its true relation to human welfare. Even research in dental fields is regarded, in important schools of medicine, as something intrinsically inferior. These deplorable conditions occur in universities where dental and medical schools are closely associated. And yet, despite the prevailing medical lack of information regarding clinical dentistry, many physicians, often against the protests of the dentists of the patients concerned, peremptorily order extraction of particular teeth, or sometimes of all remaining teeth, on the assumption apparently that a dentist's judgment cannot be right when it conflicts with a physician's guess. It is also true that the biological ignorance of many dentists, owing to deficient education in the medical sciences and in the requirements of oral medicine, often accounts for the disrespect of physicians for the views of dentists, and frequently makes dental contributions to consultations on the health of patients clearly unreliable.

D. DENTISTRY PROPERLY A FORM OF HEALTH SERVICE TO BE MADE EQUIVALENT TO AN ORAL SPECIALTY OF THE PRACTICE OF MEDICINE

Recent advances of science on the borderline between medicine and dentistry, particularly during the past fifteen years and especially from the contributions of bacteriology, pathology, and roentgenology, have shown that certain common and simple disorders of the teeth may involve prompt or insidious development of serious and possibly fatal ailments in other parts of the body. It has also been demonstrated that dental service, even when superficially perfect from purely mechanical

and esthetic points of view, may hide or evolve local pathological conditions favorable to the onset of infectious disease elsewhere in the system, if such practice disregards certain physiological requirements that neither dentistry nor medicine appreciated before the advent of recent discoveries. A discriminating attitude by individual physicians and dentists toward dental disorders, in the light of the most significant of these disclosures, has greatly extended the knowledge of specific relationships between oral and systemic pathological conditions, and has aroused belief in the existence of others awaiting detection. The reality of such significant correlations has emphasized the desirability of searching enquiry into their nature and into the extent of their occurrence, for the promotion of more accurate diagnosis and of more nearly perfect control, by both dentists and physicians, of numerous conditions of local or general disease.

The import for both dentistry and medicine of these significant findings, and of the further discoveries they presage, is obvious. They force the conclusion that dentistry is an important mode of health service, and that in general it is quite as significant for the maintenance of health as some of the accredited specialties of medical practice. Dentistry should no longer be ignored in medical schools, and its main health-service features should be given suitable attention in the training of general practitioners of medicine. Antagonism between medicine and dentistry cannot be explained on any basis of public interest or advantage and has no justification in any sentiments that are worthy of respect, for both professions are agencies for health service and cannot render it faithfully on any other conditions than those of earnest and effective coöperation. The practice of dentistry should be made either an accredited specialty of the practice of conventional medicine, or fully equal to such a specialty in grade of health service.

There are two sides to the question raised by the alternatives in the last preceding statement. Against the desirability of a conversion of the practice of dentistry into an accredited specialty of the practice of conventional medicine are a number of important prevailing conditions. Since the dental and the medical statutes in every state in this country, and in every province of Canada, oppose serious obstacles, the dental laws would have to be repealed. Neither organized medicine nor organized

dentistry desires such a conversion or would be content with it. If the dental schools were discontinued and dentistry taught only to medical students, the growing general demand for dental practitioners could not be met by the best medical schools unless they doubled the size of their student bodies and completely reorganized their work. Owing to the need for exceptional digital facility in the manifold intra-oral procedures of dental practice, and for esthetic felicity in their execution, the extensive technical training and the clinical instruction and practice peculiar to dentistry cannot be superimposed upon a conventional medical curriculum, leading to the degree of M.D., without making the period of dental training prohibitive in length for most prospective general practitioners. Besides, the medical curriculum is altogether too rigid, and the views of medical state boards and of medical teachers too unyielding, to permit substitution of training in the essential mechanical and esthetic aspects of dentistry for anything now contained in the required parts of the undergraduate medical curriculum, although the inclusion of oral subjects among the prospective elective courses to be open to candidates for the M.D. degree would facilitate special instruction in dentistry under the auspices of medicine. Unlike the practice of some specialties of medicine, such as that relating to disorders of the eye by diagnostic and directive medical specialists in ophthalmology (oculists), supplemented by modern optometrists as specialists in refraction and by opticians, the direct practice of health service applied to the teeth could not be divided properly among analogous stomatologists (dentists) and dental technicians. Such a distribution is unattainable because dentistry, in all of its terminal manifestations, must be practised in the mouth of the patient. The independent dental practitioner must comprehend the import of the variable biological conditions involved and also must possess the skill to perform the requisite intra-oral hand-work.

In support of these deductions it may be said that the details in an ophthalmologist's or an optometrist's prescription for a pair of glasses can be obtained and transmitted with exceptional precision. On such a prescription, glasses can be made by machinery, by an optician, with relatively perfect accuracy, under standard and stable conditions, and the glasses can be fitted by an optometrist (or optician) by very simple superficial adjustments that may have considerable range of mechanical

and biological variations without detriment to the patient's eyes. In dentistry, however, the equivalent of an ophthalmologist's (or an optometrist's) prescription cannot often be "obtained and transmitted with exceptional precision," nor filled accurately by machinery. The dental analogue of an optician's glasses must be fitted as a rule with microscopic exactness to prevent accession of microorganisms into the substance of the tooth or teeth affected, or to avoid unnatural or undesirable contacts with or stresses upon the teeth and tissues involved or against which the appliance impinges. Anything placed in or on the teeth, however well prepared it may be mechanically, rarely fits perfectly when first tested. It must be directly and often patiently adapted because of the individual peculiarities and the inherent difficulties of the attending variable oral and operative conditions. For this reason an appliance made by a dental technician from a dentist's models or specifications cannot be fitted by the technician or any one else as superficially as an optometrist (or optician) effectually adjusts a pair of glasses. On the contrary, it must usually be modified and tested in place in the mouth, until its adaptation is perfect, in accordance with all of the complex anatomical, physiological, and esthetic requirements and the extreme degree of mechanical accuracy involved. Finally, it must be skilfully put into place, and adjudged mechanically and biologically sound, and artistically satisfactory, by the "diagnostic and directive" practitioner of dentistry himself. A dental technician can prepare an appliance from a dentist's models or specifications and, under a dentist's supervision, can adaptively modify it. By attending to various extra-oral procedures, a cooperating technician can very effectually and desirably increase the amount of time available to a dentist for direct personal intra-oral service for his patients. But without the education in the medical sciences that the practice of dentistry requires, the most competent dental technician, who with such additional training would be a dentist and not a technician, could not be safely entrusted with the responsibility of fitting dental appliances. At present he could not do so without violating the statutes that regulate the practice of dentistry in this country and in Canada.

On the other side of the question raised above, it is plainly essential, from the point of view of public welfare, that, if dentistry cannot become an accredited specialty of the practice of conventional medicine,

it should be made the health-service equivalent of an oral specialty of medical practice in continued independence of medicine, so far as organization is concerned. For the laity, the quality of health service rather than the recognition of traditions or partisanship pertaining to such service is the primary desideratum, and medicine or dentistry by any other name would be a service just as grateful. If dentistry, having been developed and established as an independent form of organized public service, can rise promptly to its opportunity to become the full health-service equivalent of an oral specialty of the practice of medicine, and will do so in good order and without economic waste, as it appears to be inclined to do, then few would welcome the needless embarrassments and demoralizations that would follow an attempt to destroy progressive dentistry by forcibly including it in conventional medicine. If, however, dentistry as now organized should not wish to become or could not develop into the full health-service equivalent of an oral specialty of medicine, public interest would ultimately require the creation of an accredited specialty of medicine to render oral health-service in conformity with all of the evident necessities of such practice.

It should be clearly recognized that actualities rather than labels or symbols are the important factors in a consideration of this situation. It is helpful to recall that the term "medicine" is commonly used to signify not only the healing art in a general broad academic sense, but also to indicate particularly the practice of that part of the whole of the healing art that is usually taught to persons who receive the M.D. degree. "Healing art," as a term, does not logically include the application of means to prevent the occurrence of disease or to maintain health and normality, but medicine and dentistry are employing such agencies with increasing effectiveness in the most desirable extensions of their usefulness. "Practice of medicine" does not conventionally include such factors in health conservation as dentistry, public-health administration, nursing, and pharmacy. By regarding the practice of these and also of some minor types of activity for the maintenance of health or for the prevention or cure of disease, together with the practice of conventional medicine, as divisions or branches of *health service*, in the broadest and most comprehensive sense of the term, instead of divisions or branches of "medicine," one not only follows a logical and convenient course of

reasoning, but also ignores the insignia of useless professional partisanship, and obtains a clear suggestion of the proper position and due recognition of the practice of dentistry as it is, and also as it may be extended.

The outstanding deficiency of the science of dentistry has been its inability, hitherto, to discover methods for the general prevention of decay of teeth and of diseases of the closely adjacent tissues. Scientific establishment of adequate means to these fundamental ends would revolutionize the practice of dentistry by eliminating the chief present occasion for it. Although these disorders are among the most common of all bodily ailments, they have received little attention from medicine. Dentistry, deeply absorbed in oral mechanics, and not versed in oral medicine, has been baffled by them and, until recently, has been content to follow with repairs, reconstructions, and replacements. The primary causes of dental decay and of periodontal disease appear to be hidden in the biological secrets of the conditions or processes of dentition, nutrition, coördination, or oral variability. It seems probable that the causative influences, whether related to defective dental development, impaired nutrition, discoördinations, or particular conditions of dental environment, or to all of them, will not be discovered until the medical sciences are used effectively to this end. When dentistry becomes equivalent to an oral specialty of medicine, its vision and effort, combined with biological understanding and aided with methods of enquiry of corresponding adequacy, may be expected to bring these dental maladies into the realm of the completely preventable disorders, if that should not prove to be inherently unattainable. Comprehensive and penetrating research in these relationships is a basic need for the universal promotion of human welfare.

E. PRIMARY EDUCATIONAL NEEDS OF DENTISTRY AS AN EQUIVALENT OF AN ORAL SPECIALTY OF THE PRACTICE OF MEDICINE

Development of the art of dentistry into the equivalent of an oral specialty of the practice of medicine would require a new and more comprehensive definition of dentistry, a corresponding extension of the scope of dental health service, and commensurate improvement of den-

tal education. Expanded as it should be in biological scope and strengthened in all its health-service aspects, dentistry, then a learned profession, would be devoted, in broad terms,

- (a) to establishment of the principles, and
- (b) to application, in all forms and degrees, of scientific health-service relating directly to the teeth and to the closely adjacent oral tissues, and indirectly to the welfare of other parts of the body and of the whole system;
- (c) to discovery of the correlations between dental and oral conditions and systemic diseases, with special reference to observed effects of distant disorders on the teeth and closely adjacent oral tissues, and of dental and oral abnormalities on the health of the body as a whole;
- (d) to detection, and provisional diagnosis, of dental and oral symptoms that indicate the prevalence or imply the probable existence of ill-health elsewhere in the body; and
- (e) to suitable, supplemental, advisory health service, including consultation with the patient's physician, based on such observations (c) or diagnoses (d).

In this view of an enlarged dentistry, its practitioners would be trained to give the service not only of dental surgeons and dental engineers as at present, but of oral sanitarians and oral physicians as well. Instead of examining only the teeth and mouth of a patient, as is now usually the case in a restricted view of their responsibility, they would also suitably enquire into and keep careful records of the state of the patient's health, particularly as it affects or is modified by conditions of the teeth and mouth. Dentists would plan their procedures to meet not only the local indications but also the possible requirements of extra-oral relationships; would also recognize and note the significance of outstanding symptoms of systemic disease, and warn or advise the patient accordingly, or explain his need for a physician's attention; and could effectively discuss, with a physician, the oral conditions in their relation to a patient's general welfare. Prevention of disease at all ages would become an inherent and predominant motive. The frequency with which

dentists are, and will continue to be, consulted for oral health-service gives them special opportunity and occasion to note not only the occurrence of oral and systemic diseases, but also the existence of correlations between them, and to help or guide patients accordingly.

The type of training afforded by most of the dental schools does not promise to make the practice of dentistry the health-service equivalent of an oral specialty of the practice of medicine, and important general improvements of dental education are required for the attainment of that objective. Appreciation by dental teachers of the necessity for thorough instruction in the mechanical aspects of the practice of dentistry has seldom been accompanied by due comprehension of the need for intimate understanding of the pathological involvements and of the health-service relationships of such practice. Consequently, in most dental schools, instruction of dental students in the medical sciences has been unwisely directed, indifferently given, and poorly assimilated; and the practice of dentistry has failed, from lack of knowledge, ability, and vision, to measure up to its opportunity in health service. The general practice of dentistry is based on an amount of pre-professional education—graduation from a high school or its equivalent—that is too slight to sustain the mental load of effective study of the medical sciences. If the pre-dental educational requirement were raised to equality with that of the pre-medical—at least two years of appropriate work in an academic college—the necessary medical sciences and their applications could be taught to dental students as effectually as to students of medicine, and there would be not only less current general disparagement of dentistry as intellectually inferior to medicine, but also less embarrassment of dental progress.

To make the dental practitioner an expert in reparative and reconstructive procedures—a good dental mechanic, in short—has been the paramount purpose of dental education, which has been primarily manual training. In the attainment of this important aim, a broad preliminary education has been mistakenly regarded by dental leadership, with notable exceptions, as a subordinate qualification, which, while perhaps theoretically desirable, was practically unnecessary and apt, from the length of time required for its acquisition, to delay the beginning of dental study until a period in the age of the student when his capacity for ac-

tive development in manual dexterity had become impaired or lost. Immaturity and ignorance, with hypothetically superior neuromuscular adaptability to digital training, have been preferred to relative maturity and wisdom, with greater degrees of understanding and capacity.

Owing to the prevalence of such mistaken views, a heritage from the days when dentistry was a mechanical trade, only twenty-two of the forty-three dental schools in this country in September, 1924, required work in an academic college for admission. At least one year of such study was first exacted effectually by fifteen schools in 1921, under the leadership of the Dental Faculties Association of American Universities. Very few practising dentists in the United States have been students in an academic college. Practically all of the graduates of dental schools in this country, including those of 1924, have been trained in institutions where the professional curricula were based on academic requirements ranging from nominal "possession of a good English education" to graduation from a high school; but in 1925 all of the graduates for that year from seventeen dental schools in this country had at least one year of instruction in an academic college, and by 1928 the graduates of a majority of the schools will have received that extent of preliminary education. An admission requirement of at least one year of approved work in an accredited academic college is now among the Dental Educational Council's minimum requirements for its Class A or Class B rating, beginning in September, 1926. Therefore, practically all graduates in dentistry in 1930 and thereafter will have had at least one year of instruction in an academic college. Medical education in this country has been based almost universally, since 1918, on an entrance requirement of at least two years of work in an academic college, including some prescribed subjects of study, following graduation from a four-year high school. From present indications, it may safely be assumed that this pre-medical requirement will never be reduced in length. Since that extent of preliminary education is concededly desirable for such medical specialties as oto-laryngology, rhinology, ophthalmology, and dermatology, it should be equally valuable for dentistry as an analogous mode of health service.

The foregoing views may be summarized in the general statement that dentistry is a highly mechanical division of the healing art, which

has been closely organized independently of medicine, and, although not an accredited specialty of the latter, is a very important division of health service that should be extended in scope and improved sufficiently to make it equivalent to an oral specialty of the practice of medicine, either as an accredited part of medicine or independently of it. Among the chief improvements that such expansion and betterment would involve are deeper appreciation, among dentists and physicians, of dentistry as a division of *health service*; more effectual teaching of the medical sciences and of their applications both to prevention and to treatment; and an amount of preliminary education that would not be less than the minimum required for medicine.

Full attainment of the service equivalence of an oral specialty of medicine, by dentistry continued in its independent organization, appears to depend, also, upon general reorganization of the system of dental education on the basis of such adjustments and additions as these—modifications which already several of the best schools closely approximate in important respects:

(a) Requirement of at least two years of suitable pre-professional work in an academic college, including several extra courses in such subjects as oral hygiene, fine art, and mechanics, that would either stimulate interest and develop ability in the prospective practice of dentistry, or reveal ineptitude.

(b) Reorganization of the undergraduate curriculum in dentistry into three academic years instead of four, each suitably lengthened if necessary; and the curriculum made particularly effective for intensive and integrated training in medical science, dental technology, clinical dentistry, and oral medicine, in preparation for the safe initiation, by the graduate, of competent general practice of dentistry. In this curriculum, the courses should be equal in quality to those in the corresponding subjects in the undergraduate curriculum in medicine, and as far as possible interchangeable with them; the degree of B.S. to be awarded at the end of the second or third dental year, or B.A. to students who complete three years of work in an academic college before admission, in accordance with the customs of the colleges and universities concerned; and the professional degree, on graduation, to be that required for admission to the license examinations, which at present is D.D.S. or D.M.D.

(c) Addition of optional, full-year, graduate curricula, based on the three-year undergraduate curriculum and conducted on a high plane of scholastic quality, for systematic and intensive training in all types of oral specialization, including teaching and research, commensurate degrees, among them M.S. or M.A., to be awarded after at least one year of successful advanced work; and Ph.D. after at least two more years of such study and adequate attainment in research.

(d) Development of combined dental and medical curricula, with adequate dispensary and hospital facilities, for united medical and dental training of specialists in maxillo-facial surgery, public-health administration, medico-dental research, and, in general, of practitioners of the types of oral health-service that embrace most intimately the joint responsibilities of medicine and dentistry; academic and professional degrees to be awarded in accord with the nature of the study concluded and the achievement therein.

(e) Establishment of dental service including dental internships in hospitals, and of dental infirmaries in the out-patient departments; and the proper use of these clinical resources and opportunities not only for the instruction of undergraduates, but also for the promotion of graduate work.

(f) Provision of advanced courses for dental practitioners, and curricula for the proper training of hygienists, technicians, and assistants.

(g) Creation of adequate library facilities, now conspicuously absent from most dental schools.

(h) Active promotion of research, now almost non-existent in the schools of dentistry.

(i) Discontinuance of all independent dental schools, unless they can be sufficiently endowed, suitably affiliated, and properly equipped to promote satisfactorily the teaching of modern dentistry, which cannot now be claimed for them.

(j) Organization of additional dental schools, where there is need for them, in close affiliation with schools of medicine in universities.

These advanced conditions could not be established without increased financial support of dental education; but, with adequate additional resources, the most important dental schools in this country and in Canada would promptly effect the proposed improvements. A dental

school cannot develop the highest degree of educational quality, or the greatest measure of humanitarian service, from a financial soil consisting solely of the fees paid by the students and patients, on which most of the schools are now obliged to subsist. Although dentistry is a mode of universal health service, the public has done little to advance it. Endowments for the effective maintenance of the best schools of dentistry, and for cumulative improvement of their work, are urgently needed in the public interest. In this important respect dental education is identical with medical education; but, hitherto, in an era notable for the generous financial support deservedly accorded to medicine, the similar needs of oral health-service have been almost wholly ignored.

GENERAL HISTORY OF THE SCIENCE OF DENTISTRY
IN A SERIES OF VOLUMES

PART I
GENERAL HISTORY OF DENTISTRY

CHAPTER I

GENERAL HISTORY OF THE PRACTICE OF DENTISTRY

A. OUTLINE OF ITS EVOLUTION

DENTISTRY, evolving very slowly for centuries as an unorganized part of the healing art, or as a subsidiary service, attained its first significant stages of growth in France during the eighteenth and early part of the nineteenth centuries. Its greatest advancement has occurred in the United States cumulatively since 1840. Before the eighteenth century, the procedures that collectively constituted the practice of dentistry had never been organized into a systematic art nor designated by a common name. "Dentator" was used during the Middle Ages to indicate a dental specialist of surgery. The modern term "dentist" originated in France during the seventeenth century, but in England and in the American Colonies did not begin to supplant "tooth-drawer" until the eighteenth century.

Dentistry in a primitive form was practised in ancient Egypt as a part of the healing art and was slowly developed as such for many centuries among the peoples of the Mediterranean regions. After the fall of Rome and the Mohammedan conquest of Egypt, the practice of dentistry with that of surgery everywhere fell into disrespect. In Europe throughout the Middle Ages, diseased teeth were usually neglected or extracted but occasionally were replaced artificially. Because dental disorders and the extraction and the restoration of teeth were generally assumed to have no important relation to health, the procedures of removal and renewal were ignored by physicians and surgeons, or given casual attention by them, and were conducted chiefly by barbers. In modern Europe, particularly in France, the esthetic features of dental reconstructions were strongly developed during the eighteenth and earlier decades of the nineteenth centuries. Throughout Western Europe, during the nineteenth century, recognition of the pathological and surgical relationships of dentistry raised it to the status of an inferior specialty of the healing art under the jurisdiction of organized medicine, although this appreciation of the biological significance of dentistry has been attended in Europe by lack of effectual development of its mechanical and esthetic refinements. In the United States, since 1840, dentistry has been organized and developed upon an autonomous professional basis, with only nominal regard for its correlation with clinical medicine. By exceptional inventiveness, American dentistry has attained world leadership in all of the reparative phases of the art.

At the beginning dentistry, chiefly a means for the retention of loose teeth and for the artificial restoration of lost teeth, was practised to disguise disfigurement or disability. In its evolution, dental defects have been repaired and lost teeth replaced with increasing regard for the esthetic and functional aspects of dental reconstructions. Many centuries

passed before correction of irregularities in the position of teeth, and until means of limiting the extension of decay for the conservation of defective teeth, became common objectives in dental practice. Even then, health service continued to be a subordinate purpose and was achieved negatively, in the main, by extraction of diseased teeth. In recent decades there have been notable advances in the technical repair, remedial treatment, and artificial replacement of defective teeth. There has also been marked development of means for the preservation of dental function and of methods for the elimination of dental infection; and oral hygiene, as a prerequisite to the control or prevention of dental disorders, has received increasing attention.

The advent of roentgenography in dental practice twenty-five years ago as an important aid in the detection and diagnosis of hidden ailments of the teeth and supporting tissues, the general recognition during the past decade that infectious maladies of the teeth and surrounding tissues may occasion serious diseases in other parts of the body, and recent findings in chemical biology, which lay new emphasis on the importance of physiological diets and of balanced glandular functions for normal nutrition and dentition, have made the development and application of means for the prevention of dental disorders and of their systemic sequelae the paramount duty of the dental profession.

B. EMERGENCE FROM PREHISTORIC CUSTOMS

The healing art probably arose from fortunate efforts to alleviate prehistoric experiences of physical distress, and surgery was doubtless developed from the need to stop the loss of blood, to extract arrows from wounds, to support broken limbs, and to meet emergencies of similar import resulting from accident, violence, personal combat, or warfare. Presumably at a very early period in human affairs, damage to the teeth by accident or from violence revealed the consequences of gross alterations of the adult dentition, and indicated the degree of damage to which teeth might be subjected without unbearable consequences. It was customary among primitive peoples, as it is among some existing savage races, to subject healthy teeth to many types of mechanical alteration, usually for religious or ornamental purposes, but often with damaging effects on the dental structures and functions, the degree of destructiveness ranging from slight modifications of the shape of a tooth by filing, or of its structure by insertion of mineral or metallic particles into artificial cavities, to the complete removal of its visible parts by direct percussion. The deteriorations in the quality of normal teeth that resulted from such mutilations, and the ensuing unpleasant dental experiences, doubtless facilitated early invention of appliances for the restoration of dental function or of facial comeliness, or for purposes of particular ornamentation. The initial steps in the evolution of dentistry may be traced to such prehistoric reconstructions.

Diseases and imperfections of the teeth and adjacent oral parts have been noted in the

recorded experiences of all peoples. The ancient history of every important civilization mentions methods and prescriptions for the treatment of dental and oral disorders, including painful dentition, and refers to appliances for the retention of loose teeth or for the installation of substitutes. Extraction of diseased teeth has been practised everywhere from time immemorial.

C. MAIN DEVELOPMENTS BEFORE THE RISE OF DENTISTRY IN AMERICA

a. Growth among ancient peoples

Among the ancient Hindus, physicians were held in high esteem, but tooth-drawers were classed with hair-cutters, ear-borers, nail-trimmers, and bloodletters, in an inferior order outside of the Brahmanical caste. In very early times, the Chinese physicians recognized varieties of toothache and diseases of the gums, and punctured the gums and different parts of the body systematically with metallic needles (acupuncture) for the relief of pain and of abscesses. Several thousand years before the beginning of the Christian era, dental treatment attained a useful status in Egypt, where the healing art was then developed by the physician-priests, some of whom gave attention exclusively to dental disorders. These dental physicians, who were members in good and equal standing of the priestly fraternity of medicine, treated toothache and diseases of the gums, extracted teeth, used wire attachments for the retention of loose teeth, and probably devised and adjusted crude substitutes for natural teeth.

Egyptian physicians were among the attendants of kings and conquerors for centuries, and knowledge of dentistry was disseminated wherever Egyptian culture extended. The Etruscans and Phœnicians, who were highly proficient in mechanical arts and probably copied and improved the Egyptian dental appliances, used gold crowns and gold bridges. Dentistry was extensively practised by the Grecians and the Romans, and a number of important developments were made by them. Hippocrates (460-377 B.C.) wrote of dental diseases and their treatment, devised a number of simple dental instruments, practised extraction of loose teeth and cauterization of aching teeth, and described operations for fractures of the jaws. Galen (131-201? A.D.) was the first to note the presence of nerves (pulp) in teeth. Believing that those in the upper canines were branches of the nerves to the corresponding eyes, he called these canines "eye" teeth. Early in the Christian era, Roman dentists "stuffed" badly decayed teeth with lead or lint to prevent their fragmentation under pressure during extraction with a forceps, a procedure that foreshadowed use of metallic filling materials to arrest the progress of dental decay. After extracting temporary teeth in the path of irregularly placed successors, they applied force daily with a finger to push the new teeth into their proper places, thus initiating procedures that have culminated in modern orthodontia.

b. Status during the Middle Ages

Throughout the medieval period, the healing art not only failed everywhere to advance with the momentum it had acquired, but also suffered a serious decline in quality and in general esteem. Physicians continued to regard surgery disdainfully as mere hand-work and surgeons as ordinary artisans and therefore as inferiors, and harassed the progress of surgery by devices best known to the times. Dentistry, which consisted chiefly of extraction of teeth and of their artificial replacement, was regarded by surgeons, in their turn, as so completely lacking in the requirements of surgical skill and ability that it was unworthy of their capacity and dignity and fit only for barbers, the minor surgeons of the age. Later, the surgical barbers, insisting upon recognition of the importance of their attainments in surgery, obtained public recognition of their equality with the surgeons, and for several centuries in western Europe all types of surgery were performed freely by "barber-surgeons." Ultimately, however, growth of the medical sciences, and increasing public appreciation of the importance of precise knowledge of anatomy for the proper conduct of surgical operations, elevated the status of surgery toward the higher plane of the practice of medicine. The union of barbers and surgeons was dissevered and the barbers were excluded from the surgical fraternity. But, after the barbers had again been reduced to an inferior position, they were entirely free to proceed with dentistry, the practice of which, because of its assumed triviality, did not seem to require any more knowledge of anatomy or of surgery than that needed in cutting hair or shaving beards, or in making and fitting wigs.

During the long medieval period, methods for the superficial mechanical treatment of diseased teeth and gums were diversified but not materially bettered; replantation of teeth was extensively practised; special attention was given by some practitioners to the systematic removal of dental tartar; operative instruments were occasionally invented and improved, including sets of scrapers (scalers) suggestive of the variety of similar instruments now employed by periodontists and indicating early attention to periodontoclasia ("pyorrhœa"); new mixtures were tried in dental cavities for the purpose of arresting the progress of decay, and gold-leaf came into use as a filling material.

c. Progress in modern Europe

The modern era in surgery dawned during the sixteenth century with the classical achievements of Paré (1510-1590), who was successively a barber, barber-surgeon, master barber-surgeon in the French army, and surgeon to the French court. In his books, Paré discussed dental disorders, evidently in the light of his special dental experiences as a tooth-drawer while a barber. He was one of the first to describe a procedure for the transplantation of teeth and to use appliances for the improvement of speech and of swallowing after damage to the roof of the mouth through faulty development or by violence or

for the preservation of decayed teeth, and clasps instead of ligatures were used for the retention of partial dentures. The clumsy pelican, which had succeeded the forceps and had long been employed for extractions, was replaced by improved keys, various forms of which are still in use to some extent in France and in several other countries of Europe. In France, during this century, growing appreciation of esthetics in dental prosthesis led to the production of porcelain teeth for dental reconstructions. Philip Pfaff, author of an early treatise on dentistry, and dentist to Frederick the Great, initiated the practice of protecting an exposed dental pulp before placing a filling in the cavity; constructed artificial teeth from silver, mother-of-pearl, or enameled copper; and improved dental prosthesis by inventing the plaster model prepared from an initial beeswax impression. John Hunter, eminent English anatomist and surgeon, published many important anatomical contributions to dentistry, promoted the practices of replantation and transplantation of teeth, and fully described these operations, which were performed frequently in his day. In 1768, Thomas Berdmore, dentist to George III of England, published one of the most useful books on dentistry, an American edition having been printed as late as 1844. He gave instruction to Robert Woofendale, an Englishman, who from 1766 to 1768 was the leading dentist in the American colonies.

The history of the dental art during the sixteenth, seventeenth, and eighteenth centuries was chiefly a record of the progress of dental practice in France and, in the eighteenth century, along the lines laid down by Fauchard, but the turmoil of the French Revolution and of the ensuing wars interrupted that development. In the succeeding century, leadership in the march of progress in dentistry having passed to the dental profession in the United States, Thomas W. Evans, an American, became dental surgeon to the Emperor and Empress of the French.

D. ADVANCEMENT IN THE UNITED STATES BEFORE THE ESTABLISHMENT OF THE FIRST DENTAL SCHOOL IN 1840

a. Colonial era

Dentistry in the United States, before the nineteenth century, was a weak reflection of dental practice in the mother countries of the respective colonial groups, and was practised by an occasional physician or surgeon, many barbers and mechanics, and an increasing number of charlatans. As early as 1636, if not before, physicians and barber-surgeons entered the Plymouth Colony; and it is definitely known that in 1639 one of the barber-surgeons gave attention to dental ailments. Throughout the colonial era, there were few events in the record of American dentistry beyond indications of its humility and the superficiality of its service. Newspaper advertisements constitute the chief items of that record, in which, as a rule, individual practitioners presented routine statements

of their proficiency and readiness to apply their art. One of these early American dentists advertised himself also as by trade a hair-dresser and maker of wigs (New York, 1768); another, as "a midwife, oculist, and dentist from Europe" (New York, 1777).

Paul Revere (1735-1818), famous for his midnight ride, a goldsmith and ivory-turner by trade, also engaged in copper-plate engraving, in printing, and in the practice of prosthetic dentistry. Evidence regarding the latter appears in the terms of the following advertisement in the *Boston Gazette and County Journal*, for August 29, 1768:

"Whereas many Persons are so unfortunate as to lose their Fore-Teeth by Accident, and otherways, to their great Detriment, not only in Looks, but speaking both in Public and Private:— This is to inform all such, that they may have them replaced with false Ones, that looks as well as the Natural, and answer the End of Speaking to all Intents, by PAUL REVERE, Goldsmith, near the Head of Dr. Clarke's Wharf, Boston. All Persons who have had false Teeth fixt by Mr. *John Baker*, Surgeon-Dentist, and they have got loose (as they will in Time) may have them fastened by the above, who learnt the Method of fixing them from Mr. Baker."

Significant conditions in early American dentistry are suggested by a series of facts beginning with the career of a son of the first professor of mathematics and natural philosophy in Harvard College and the pastor, for a time, of the congregation of the Old North Church in Boston. The son, Isaac Greenwood, Jr., was a wood- and ivory-turner, a maker of mathematical instruments, an umbrella manufacturer, and a dentist, all of which trades he followed simultaneously in Boston as early as 1750. He had five sons, four of whom were taught mechanical trades and dentistry, and became mechanics and dentists. One of them, John Greenwood (1760-1819), a skilled mechanic and maker of cabinets and mathematical instruments, practised dentistry successfully in New York City from 1784 until his death. He was the first American to treat an abscessed maxillary sinus through the socket of a molar tooth. During the period from about 1791 to 1798, he made several sets of full upper and lower dentures for George Washington, by whom he was highly esteemed. The example and personal guidance of John Greenwood were important influences in the career of Horace H. Hayden (1768-1844), who was one of the chief factors in the inauguration, in 1839-40, of the modern era in American dentistry (pages 38-40).

b. Early period of American independence

Conditions in an army camp at the close of the Revolutionary War prepared the way for accelerated development of the practice of dentistry in the United States. During the winter of 1781-82, after the war had been practically concluded and while the allied Continental and French armies were encamped side by side near Providence, Rhode Island, Jacques Gardette (1756-1831), a French naval surgeon who was also a trained dentist, relieved distress among many of his comrades by giving them skilful dental treatment.

Surgeon Le Mayeur, one of Gardette's colleagues, occasionally performed similar operations. The peaceful conditions of the winter camp facilitated extension of this dental service to an increasing number of Americans. Josiah Flagg (1764-1816), a private in the Continental Army, having been attracted to the dental achievements of Gardette and Le Mayeur, became an apt pupil and soon independently attended to the dental ailments of some of his comrades. Visitors to the camp and returned soldiers, impressed by the dental practice of Gardette, Le Mayeur, and Flagg and recounting its benefits, created new demands for dental surgery.¹

Gardette practised dentistry from 1784 to 1829, in Philadelphia, where he acquired a high reputation. For many years he continued, as a private preceptor, to teach dentistry and to promote its development in this country. After an itinerant practice, in the vicinity of Boston, Flagg established himself as a surgeon-dentist in that city, where, for nearly thirty years, he engaged in the general practice of dentistry and in the instruction of apprentices. Flagg was the first native-born American who received a preliminary dental training that involved the point of view of the surgeon, and who devoted himself entirely to the general practice of dentistry.

The following advertisement in a Boston newspaper by Josiah Flagg, in 1796, shows in a striking manner the scope and character of the general practice of dentistry in the United States, at the end of the eighteenth century, by one of the best trained and most experienced surgeon-dentists of the period :

“**JOSIAH FLAGG, Surgeon-Dentist.** Informs the public, that he practises in all the branches, with improvements. [i.e.] Traisplants² both live and dead Teeth with greater conveniency, and gives less pain than heretofore practised in Europe or America ; — Sews up Hare Lips ; — Cures Ulcers ; — Extracts Teeth and stumps, or roots with care ; — Reinitates² Teeth and Gums, that are much depreciated by nature, carelessness, acids, or corroding medicine ; — Fastens those Teeth that are loose ; (unless wasted at the roots) regulates Teeth from their first cutting to prevent feavers and pain in Children ; — Assists nature in the extension of the jaws, for the beautiful arrangement of the second Sett, and preserves them in their natural whiteness entirely free from all scorbutic complaints — and when thus put in order, and his directions followed, (which are simple) he engages that the further care of a *Dentist* will be wholly unnecessary ; — Eases pain in Teeth without drawing ; — Stops bleeding in the gums, jaws or arteries ; — Lines and plumbs Teeth with virgin GOLD, FOIL, or LEAD ; — Fixes *Gold Roofs and Palates*, and artificial Teeth of

¹ American historians have maintained the venerable tradition that Joseph Lemaire, the distinguished Parisian surgeon-dentist, who died in 1834, was the chief factor in the introduction of French dentistry into the United States. The creators of this tradition failed to ascertain the fact that Lemaire was born on March 26, 1782 — at the close of the winter in which Le Mayeur and Gardette were Flagg's preceptors. The legend originated when some of the founders of modern dentistry in America, aiming to set forth its origin and apparently impressed by the romantic aspects of the reputation of the then late Lemaire, confused his identity with that of Gardette's fellow naval surgeon Le Mayeur. For several years after the close of the Revolutionary War, Le Mayeur practised surgery in Philadelphia, where he specialized in the transplantation of teeth, though with doubtful success. He disappeared in 1787, when Joseph Lemaire was only five years of age. Cf. VIARD: French dentistry in the United States; Proceedings of the Congress of Bordeaux, 1923; *Dental Cosmos*, 1925, lxxvii, p. 389 (April).

² The word appears thus in the original.

any quality, without injury to and independent of the natural ones, greatly assisting the pronunciation and the swallow, when injured by natural or other defects. — A room for the practice with every accommodation at his house, where may be had Dentifrices¹ Tinctures, Teeth and Gum Brushes, Mastics, &c. warranted approved and adapted to the various ages and circumstances: — Also Chew-sticks, particularly useful in cleansing the fore Teeth and preserving a natural and beautiful whiteness; which Medicine and Chew-sticks are to be sold wholesale and retail, that they may be more extensively useful.

“Dr. FLAGG, has a method to furnish those Ladies and Gentlemen, or Children with artificial Teeth, Gold Gums, Roofs, or Palates, that are at a distance and cannot attend him personally. CASH Given for *Handsome and Healthy Live* TEETH, At No. 47, Newbury-Street, BOSTON, (1796.)”

In an earlier similar advertisement (1785), Flagg included the following statement:

“Cuts the defects from the teeth and restores them to whiteness and soundness without saws, files, acids and such abusives as have shamefully crept into the profession, and which have destroyed the confidence of the public.”

During the years after the close of the War of Independence and before 1840, important advances were made in the practice of dentistry. Porcelain teeth for more durable and esthetic restorations were brought from Paris and their manufacture on a large scale was begun in this country. The French mode of correcting irregularities in the position of teeth was introduced. The procedure of filling cavities to arrest the progress of decay and to preserve the remaining portions of teeth first came into general application, and plastic materials devised in France were receiving attention for this purpose. Among the chief American contributions were the special preparation of gold for use in filling dental cavities, the invention of a dental articulator for the betterment of reconstructive work, the elaboration of dental bridges, and improved medicinal treatments of diseased dental pulps. The first American books on dentistry were published during this period—by Richard C. Skinner in 1801, and by B. T. Longbothom in 1802.

E. ORGANIZATION AND PROMOTION IN THE UNITED STATES SINCE 1840

a. Inauguration of the era of coöperation among dentists

The years between the close of the War of Independence and the end of the fourth decade of the nineteenth century were notable, in the history of American dentistry, for a cumulative demand for dental service, an increase in the number and distribution of dentists, a widespread extension of itinerant dental practice, and a menacing growth of quackery. Dental schools had not yet been established, and the medical schools and most of the physicians continued to ignore the dental aspects of the healing art. Dentistry was a trade that might be acquired during an apprenticeship, or undertaken without training

¹The word appears thus in the original.

and learned through unguided experience; and any one was free to practise, without public restraint, whether he knew anything about it or not. The succession of important developments in the methods of practice throughout this period improved public appreciation of dentistry as an art, and increased the number of self-respecting prospective practitioners who sought the effective preliminary training that could be obtained by apprenticeship in the offices of established dentists. Unfortunately, however, the financial profits that individual dentists were able to derive from the system of apprenticeship encouraged secrecy and selfishness in the use of new methods and of inventions; and, instead of being colleagues in service, dentists in increasing number became rivals in trade, and succumbed to the temptations of charlatanry.

Protests by the conscientious and better educated dentists against the continuance of these conditions gradually became more outspoken and influential in the guidance of public opinion. Books, pamphlets, and papers in medical journals delivered broadsides against greed and imposture, and taught the public the importance of the care of the teeth. A small though increasing number of physicians, who had been giving particular attention to dentistry, some of them developing it as a specialty in their practice of medicine, added the weight of their influence against trade secrets and quackery in dentistry. Gradually the prospective value of coöperation for the elevation and advancement of dentistry, and for the consequent promotion of the public welfare, became obvious, and several local societies were organized. Finally, in 1840, leading practitioners of dentistry established the American Society of Dental Surgeons, the first national association of dentists.¹ An important factor in this movement was the *American Journal of Dental Science*, the first journal of dentistry, which had been founded in 1839; and a strong influence in support of the development was the simultaneous inauguration of formal instruction in dentistry by the Baltimore College of Dental Surgery, the first school of dentistry. Within a period of practically one year, constructive leadership such as had never before appeared among dentists laid the foundations of publication, of organization and intercommunication, and of special education, on which has been based the modern evolution of the dental craft into the dental profession.

b. Organizations of practitioners of dentistry

Soon after its organization, the American Society of Dental Surgeons became involved in dissensions that gradually destroyed its usefulness, but the advantages of effective coöperation had been demonstrated; and, after the Society ceased to function, other national bodies took its place. The disruption of the Society was due in the main to an error of judgment in the zeal of some of its members to prevent quackery. Amalgam had recently been introduced from France as a filling for cavities in teeth. Although the relative ease

¹A local dental society was organized in 1834 (page 34). The first medical societies in the American colonies were founded about a century earlier.

with which it could be handled gave it wide popularity, most of the leading practitioners believed it to be unsuitable for the purpose. Its free use by dental quacks increased this feeling. Accordingly, in 1843, the Society formally denounced the use of amalgam as a filling material. Subsequent developments in the use of amalgam failed to justify this decision, but the morale of the dental profession had been seriously affected by the ensuing conflict. The offending resolution was rescinded in 1850, but this action did not retard the decline of the Society, which was disbanded in 1856.

The associations that succeeded the American Society of Dental Surgeons, and which contributed to the ultimate success of the movement for effective national organization of dental practitioners, were the American Dental Convention (1855-1876); the American Dental Association (1859-1897); the Southern Dental Association (1869-1897); and the National Dental Association, which in 1897 was organized by the union of the American and Southern associations, and in 1922 changed its name to American Dental Association.

The membership of the original national Society was composed wholly of dentists, but that of the Convention included also men who were active in the sciences contributory to dental progress. An early attempt by the Convention to establish a special fund for the support of research failed from lack of interest and understanding. Despite the superiority of the Convention over its predecessor, in organization and procedure, it was unable to meet the needs of dentistry, and ultimately was displaced by the first American Association, the membership of which consisted not only of dentists as individuals but also of elected delegates from local dental societies, which had been steadily increasing in number. The events of the Civil War interfered with the activities of both the Convention and the first American Association, and occasioned the organization of the Southern Association; but by 1897, each of the latter two bodies having become national in spirit and their relations having grown intimate, no reasons for separation remained and their amalgamation followed as a matter of course.

In 1913 the National Dental Association was reorganized on a plan similar to that adopted by the American Medical Association in 1901, and became in effect an organization of the members of the dental societies in the individual states, the legislative authority residing in a house of delegates elected by the component organizations. In 1911 the Association established a Relief Fund Endowment, now approximately \$150,000, with which to assist dentists during disability or old age.¹ In 1913 the Association began the publication of a Bulletin, which in 1915 was converted into the *Journal of the National Dental Association*, was published quarterly from 1915 to 1917, and has been issued monthly since 1917. In 1913 the Association established a fund for the promotion of research, which, derived chiefly from annual contributions by members,

¹The data in this paragraph have been revised by Dr. O. U. King, Secretary of the Association, and are accurate as of October 1, 1925.

now amounts to over \$115,000. Since 1921 this fund, permanently invested at a relatively high rate of interest, has been yielding an annual income of \$4549.20, which, beginning on September 1, 1926, will be \$6823.80. The grants for research in 1925-26, to be paid mainly from the membership dues, amount to \$28,000. In 1914 the Association established a general endowment fund, which is almost \$125,000. The total net assets of the Association, not including the good-will of the *Journal*, have mounted to \$390,000. The number of members has been increasing annually and is nearly 35,000.

In addition to the general association of dental practitioners, which advances the interests of the dental profession and of dentists, the American College of Dentists, an important honorary body, organized in 1920 and consisting of leading practitioners in the United States and Canada, promotes the highest professional aims. There are also numerous national organizations of specialists in the practice of dentistry, the members of which, in nearly all instances, are members also of the American Dental Association.

Dentists began to organize local societies as early as 1834. The first of these, with an indefinite history, was the Society of Surgeon Dentists of the City and State of New York, which originated the D.D.S. degree. The oldest of those now in existence is the Pennsylvania Association of Dental Surgeons, which was organized in 1845. Every state has its general dental society, many of which bear important relations to the selection of the members of state boards of dental examiners. Each of the larger cities has at least one general society of dentists. Such organizations exist in many counties, in rural centres, and in geographical districts of various types and sizes, in all parts of the country. There are also many local societies of specialists in the practice of dentistry. The organizations of Negro dentists are discussed in Chapter V.

c. Educational agencies for the betterment of dental practice

Nearly all of the existing societies of practitioners of dentistry have been organized to improve the quality of dental practice through the presentation and discussion of new observations and findings, and they exercise an important educational influence.

The chief educational agencies for the direct improvement of the practice of dentistry have been schools of dentistry since 1840, national associations of dental schools and dental teachers since 1884, and a national council on dental education since 1909. The relation of the dental schools and these national organizations to the evolution of modern dentistry is considered in Chapter II.

d. Organizations for the public regulation of the practice of dentistry

Before 1842 there were practically no public requirements for admission to the practice of dentistry in any part of the United States. In that year Alabama nominally began to

require an examination by a medical board for admission to the practice of dentistry, but the law appears to have been inoperative from neglect. In 1868, however, Kentucky, New York, and Ohio enacted laws that specified definite requirements for admission to the practice of dentistry within their boundaries, and gave power of enforcement to state boards of dental examiners or to equivalent official bodies. Since 1900, similar statutes have been in force in every state in the Union.

The public importance of the regulative function of the state boards of dental examiners was evident from the outset. It soon became apparent, however, that the boards might also effectually work together for the promotion of the general welfare and for the enhancement of the value of dental service to the individual patient. Aiming to encourage interstate coöperation not only for the advancement of the routine work of the examiners, but also for the elevation of educational and professional standards, and for the attainment of general uniformity in the statutory requirements for admission to dental practice, representatives of the state boards of Georgia, Illinois, Indiana, Iowa, Michigan, Ohio, and Vermont, at Niagara Falls on August 6, 1883, organized the National Association of Dental Examiners. This voluntary association of the state boards, which holds annual meetings and regularly publishes its *Proceedings*, has been one of the most important factors in the improvement of the status and quality of dentistry in the United States. The influence of the state boards of dental examiners and their national association, in the regulation of dental practice and of dental schools, is discussed in Chapters III and VI, respectively.

e. Dental journals

Books and pamphlets on dental subjects were circulated freely during the early part of the nineteenth century, when leading dentists also published occasional dental papers in medical journals, but, before the establishment of the *American Journal of Dental Science* in 1839, dentistry enjoyed none of the advantages arising from periodical publication directly in its interest. In 1841-50 this *Journal*, which had been established by a physician-dentist as a private enterprise, was the organ of the American Society of Dental Surgeons. Although publication of the first dental journal was discontinued in 1860, upon the death of its founder, the important benefits that accrue to a profession from the issuance of such journals had been shown to dentistry from the beginning of the *Journal's* career. New dental journals soon came into existence; many others have been added during the intervening years; and now the dental journals, published usually by dental societies or by commercial organizations, are not only more numerous than the best interests of dentistry require, but some of them, because of their mercenary character, detract seriously from public respect for the profession that supports them.

*f. Improvements in dental practice*1. *General inhalation anesthesia, as a surgical procedure, a gift from dentistry*

Crawford W. Long (1815-1878), a physician, using ether in 1842, was the first to perform a surgical operation without pain under general inhalation anesthesia. Unfortunately, being unconcerned about the fundamental importance of his achievement, and failing to give due consideration to the distress that might have been alleviated by immediate general utilization of his discovery, Long delayed publication of his experience until an independent repetition four years later, and the promptly ensuing widespread extension of the new surgical benefaction, raised personal questions regarding priority of discovery. In 1844, Horace Wells (1815-1848), a dentist, found that teeth could be painlessly extracted under general inhalation anesthesia with nitrous oxide. Although he and his office associates repeatedly accomplished this result privately, he did not obtain recognition for the procedure because of lack of persistence in promoting it after a seeming failure at an early public demonstration. In 1846, Charles T. Jackson (1805-1880), a physician-chemist, in response to related enquiries from William T. G. Morton (1819-1868), a dentist who had been an assistant in Wells's office, expressed the opinion that ether vapor would do what Wells attempted to accomplish with nitrous-oxide gas. Morton, unaware of Long's prior discovery and testing this possibility, found that a tooth could be painlessly extracted from a patient under the influence of ether, and on October 16, 1846, at the Massachusetts General Hospital, in Boston, publicly demonstrated with ether the surgical value of general inhalation anesthesia, which by one agency or another has ever since been a routine procedure both in dentistry and in medicine.

2. *Exceptional advancements*

The era in dental history that was inaugurated in this country eighty-five years ago has been notable not only for the development of general coöperation among dentists, for the establishment and development of systems of education and state regulation, and for the creation of a periodical literature, but also for exceptional advancements in the practice of dentistry, of which the boon of anesthesia in its various general and local modes has been the most appreciated. During these years it was definitely established that infections of the dental pulp or periodontal tissues frequently occasion serious maladies in other parts of the body, and the remedial treatment of teeth with diseased or lifeless pulps, or with disordered supporting tissues, was brought into increasing accord with the necessity for the complete elimination of such pathological conditions. The importance of periodontoclasia ("pyorrhea") was clearly realized and its treatment made more direct and effectual. Orthodontia was reorganized and extended. Oral hygiene, especially for the prevention of caries, particularly in children, became a matter of increasing concern, and was made the basis of an auxiliary practice. Oral surgery was created a specialty of

dental service. Antisepsis and roentgenography were made routine procedures of practice. The operating chair, drilling and cutting machinery, and a multitude of operative instruments and devices were perfected. The rubber dam was conceived; cavity preparation for filling was reduced to a scientific technique; filling materials including gold, balanced alloys, and cements were rendered more adaptable or newly devised; and methods of preparing inlays were made practical. Vulcanite was converted to dental uses; continuous gum dentures were invented; all types of dentures and oral appliances, and artificial teeth for use separately or in group, were improved; and artificial repair, with obturators and velums, of defects in the roof of the mouth and in the soft palate was carried to a very high degree of functional usefulness. Theories regarding the origin of dental disorders were placed upon a more scientific basis, and the necessity for research given more general consideration.

F. GENERAL CONDITIONS IN CANADA

The history of dentistry in Canada has been closely analogous, in character, to that in the United States, and, as there has been complete freedom of intercourse between the dentists of both countries, much of Canadian dental history is interwoven with that of the United States. Many Canadian dentists received their early professional training in dental schools of the United States. Canadians are members of several of the national dental associations in this country, and welcome visitors and speakers at the meetings of practically all of the American dental organizations. In each Canadian province the practice of dentistry is regulated by statute independently of medicine. The Canadian Dental Association, an organization of the practitioners, was founded in 1902.

The first dental school in Canada was established in 1875, in Toronto, under the auspices of the incorporated dental profession of Ontario. There are now five dental schools in Canada, the last of which was organized in 1918. The Canadian Dental Faculties Association was amalgamated in 1923, with three similar associations in this country, into the American Association of Dental Schools. These and related aspects of dentistry and dental education in the Dominion are discussed in Chapter XI.

CHAPTER II

GENERAL HISTORY OF DENTAL EDUCATION IN THE UNITED STATES

A. EDUCATIONAL STATUS OF THE PRACTICE OF DENTISTRY SHORTLY BEFORE THE ESTABLISHMENT OF THE FIRST DENTAL SCHOOL IN 1840

a. Types of practitioners and the nature of their preliminary training

BEFORE 1840 improvement in the quality and in the status of dentistry in the United States had long been hindered by the activity of quacks and charlatans. During the fifth decade of the nineteenth century, however, dentistry was steadily raised to the level of a profession by two general types of honorable practitioners. The larger group gave attention to dentistry as a trade or as an accessory to another mechanical vocation. Most of them were uneducated, drawn chiefly from the ranks of craftsmen skilled in the use of small tools, and especially interested and adept in the reconstructive phases of dentistry. They gave earnest and faithful service in useful every-day practice, but, with a few notable exceptions, contributed little of abiding value to the development of dentistry, and did practically nothing to promote its educational advancement or its biological improvement.

The smaller group, who were physicians in fact or in spirit, practised dentistry as though it had been an accepted specialty of medicine, and were usually men of high character, broad intellectual interests, engaging personality, and special influence. Pre-eminent among those who had originally been general practitioners of medicine, but were led by their appreciations and aptitudes to specialize in dentistry, was Chapin A. Harris (1806-1860), the founder of the first journal of dentistry. Others of the group, among them Horace H. Hayden (1769-1844), who organized the first national society of dentists, began their professional work as mechanical dentists, but, realizing the medical import of dentistry, subsequently studied medicine to improve their practice of it as a specialty of the healing art. These dentists with medical understanding and the instinct for health service, led by Harris and Hayden, laid the foundations of organized dentistry and of dental education; and, conceiving their art as a specialty of medicine, they endeavored to elevate it to that status in character, usefulness, and appreciation.

b. Unsuccessful efforts to develop dental education under medical auspices

The first attempt in the United States to teach dentistry in an educational institution appears to have been made by Horace H. Hayden, who, in 1837-38, gave a series of lectures to the students of medicine at the University of Maryland, but, as his effort was not appreciated by the Medical Faculty, the course was not repeated. At that time every other American medical school, the first of which was organized in 1765, had been

ignoring dentistry, although optional lectures on dental science and dental surgery had been given regularly, since about 1797, at the School of Medicine of Guy's Hospital, London, by Joseph Fox and other leading English practitioners.

Harris and Hayden and a number of associated physicians and dentists, influenced no doubt by the more favorable professional conditions in England, and stimulated probably by the important advances in the micro-anatomy of the teeth that had then recently been made abroad by improvements in histological technique, saw clearly that dentistry required special educational promotion. In 1839, aiming to develop such training under medical auspices, they suggested that dentistry be taught formally at the University of Maryland, which at the time consisted mainly of a school of medicine; but their proposal was rejected, the Medical Faculty expressing the opinion, that "the subject of dentistry was of little consequence and thus justified their unfavorable action." That the attitude of the Medical Faculty was affected somewhat by divisions among the Baltimore physicians in their support of competing local proprietary medical schools, and by unfortunate personal influences, seems to have been well known at the time, but the judgment was none the less decisive. Subsequent efforts to establish a chair of dentistry in one of the medical schools in New York met a similar fate, and all other suggestions of this character, from whatever quarter, were flatly rejected by the medical authorities concerned. Ignorance, intolerance, and professional vanity achieved another of their woeful triumphs. When the time was ripe for training in dentistry to pass from the apprenticeship stage to the institutional status, and for dentistry to become an accredited specialty of the practice of medicine, and when leading physician-dentists urged these consummations, the medical profession, through its representatives in several medical schools, refused to countenance the training of dentists under medical auspices or in medical affiliations. Rejecting the view that dental surgery was or could be important enough to deserve such educational attention, medicine declined to admit dentistry into the fraternity of the healing art, and presented conditions that forced dentists to conclude that such fellowship was unattainable. Fortunately, however, dental leadership adhered faithfully to its convictions and refused to acquiesce in the public disservice of medicine's formal and emphatic refusal to advance the knowledge, treatment, and control of the disorders of the teeth.

c. Dental education, disdained by medicine, created an independent system

When it was found that training in dentistry could not be developed under medical auspices or in association with medicine, Harris, Hayden, and their associates, accepting the best of the remaining alternatives, established an independent dental school and initiated the development of formal education in dentistry as a separate system. The first dental school was located in Baltimore, where Harris and Hayden lived, and was named

Notes to here

the Baltimore College of Dental Surgery. It is significant of the abiding medical purpose of its founders that they named it a college of dental *surgery*, and based their curriculum on the *medical* sciences. The American Society of Dental Surgeons, composed of the leading physician-dentists and dentists in all parts of the country, reacted constructively to organized medicine's disapprobation of dentistry by giving to this first dental school the Society's unqualified approval and support.

B. PROGRESS IN DENTAL EDUCATION FROM THE ORGANIZATION OF THE FIRST DENTAL SCHOOL, IN 1840, TO THE BEGINNING OF THE PERIOD OF PUBLIC REGULATION OF DENTAL PRACTICE IN 1868

a. First dental school

On February 1, 1840, the General Assembly of Maryland chartered the Baltimore College of Dental Surgery as an independent educational institution, under proprietary conditions similar to those then prevailing for medical schools. The founders and first faculty named in the charter were four doctors of medicine, two of whom, also dentists, had recently received the honorary degree of Doctor of Dental Surgery from the American Society of Dental Surgeons:

HORACE H. HAYDEN, M.D., D.D.S., Professor of Dental Pathology and Physiology, and President of the College;

CHAPIN A. HARRIS, A.M., M.D., D.D.S., Professor of Practical Dentistry, and Dean of the Faculty;

THOMAS E. BOND, JR., A.M., M.D., Professor of Special Dental Pathology, and Therapeutics;

H. WILLIS BAXLEY, M.D., Professor of Special Anatomy and Physiology.

Of the fifteen members of the Board of Visitors named in the charter, nine were physicians, and five were clergymen. The charter specified that there should be at least one annual term of instruction not less than four months in length. The Faculty was empowered to confer the degree of Doctor of Dental Surgery upon the graduates, and also upon practitioners after examination or as an honor.

The first academic year opened, on November 3, 1840, with five students; instruction was continued until the latter part of February; and the first class of two students graduated on March 9, 1841. The facilities for practical instruction were very poor until 1846, when the first dental infirmary was established. The lectures were delivered in a small room publicly situated, but, as instruction in practical general anatomy required close privacy in those days, a secluded stable loft was used for the purpose. In 1843 a demonstrator of mechanical dentistry was added to the teaching staff, and in 1846 a dem-

onstrator of operative dentistry. In 1852 the chair of "practical dentistry" was divided between two new chairs of mechanical dentistry and operative dentistry. These conditions were similar to those then prevailing in most of the medical schools.

b. Early growth of dental schools

Although the first dental school manifestly met, on a small scale, an important public need, two persistent conditions — one in dentistry, one in medicine — prevented prompt and rapid increase in the number of dental schools, either as independent institutions or as parts of medical schools and universities. In the first place, many dentists of this period, trained as apprentices, and preferring to reap the harvests of fees as private preceptors and to continue to profit from the assistance of their pupils, selfishly discouraged institutional teaching of the practice of dentistry. Secondly, physicians everywhere held dentistry in low esteem, disregarded its obvious as well as its presumptive relationships to health service, continued openly to subject it to disparagement, and discouraged all efforts to elevate it to a plane of equality with medicine. Under these unfavorable conditions the number of dental schools increased slowly and the attendance was small. For a time schools were founded only where there was exceptional demand for them. Twenty-five years after the establishment of the first dental school there were but four in existence, with a total of only 61 graduates for the year 1865. The total number of graduates of the first school, by the end of its twenty-fifth year (1865), was only 369, an annual average of less than 15. Nevertheless, leading dentists, realizing the importance of the institutional method of training, continued throughout this period to urge both increase in the number and improvement in the quality of dental schools, and sought repeatedly to interest medical schools in the cause of dental education. Finally, in 1867, in response to public suggestions by Nathan C. Keep, M.D., D.D.S., President of the Massachusetts Dental Society, a dental department was established at Harvard University, in close association with the medical department; and, for the first time in this country, dentistry was given an important educational status in a university and brought into formal affiliation with medicine.¹

c. First dental school in a university and associated with a medical school

The first academic year of the Dental School of Harvard University was four months in length, extending from November, 1867, to March, 1868. There were no educational requirements for admission. Graduation was conditioned on evidence of three years of private apprenticeship with one or more dentists; on attendance for two academic years of four months each at the School's course of lectures; and on defense of a thesis, successful examination in the subjects of the lectures, presentation of a specimen of dental or

¹The Dental Department of Transylvania University (1850-52) was not important (page 42).

pathological interest prepared during the period of instruction, and demonstration to the professors of operative and mechanical dentistry of adequate practical ability. The dental students took the lecture courses in anatomy, chemistry, physiology, and surgery that were required of students of medicine; and with these had access to the dissecting rooms, library, and museums of the medical school, and to the hospitals of Boston. The dental infirmary was located in the Massachusetts General Hospital, where, during the school's first year, about one thousand patients were given treatment for dental disorders.

TABLE I,
DATA PERTAINING TO THE DENTAL SCHOOLS IN THE UNITED STATES THAT WERE ESTABLISHED
BETWEEN 1840 AND 1868. (SEE TABLE 2)

<i>Name of School</i>	<i>Location</i>	<i>Year in which instruction was begun</i>	<i>Year in which students were first graduated</i>	<i>Total number of graduates before 1869</i>
Baltimore College of Dental Surgery ¹	Baltimore	1840	1841	437
Ohio College of Dental Surgery ²	Cincinnati	1845	1846	177
Transylvania University, Dental Department ³	Lexington, Kentucky	1850	1851 ⁴	2
Philadelphia College of Dental Surgery ⁵	Philadelphia	1852	1853	63
New York College of Dental Surgery ⁶	Syracuse	1852	1853	? ⁷
Pennsylvania College of Dental Surgery ⁸	Philadelphia	1856	1857	268
Philadelphia Dental College ⁹	Philadelphia	1863	1864	86
New York College of Dentistry ¹⁰	New York	1866	1867	18
Missouri Dental College ¹¹	St. Louis	1866	1867	14
St. Louis Dental College ¹²	St. Louis	1867	1868	?
Harvard University, Dental Department ¹³	Boston	1867	1869	...
New Orleans Dental College ¹⁴	New Orleans	1867	1869	...
Boston Dental College ¹⁵	Boston	1868	1869	...
Number of graduates: 1841-68, inclusive				1065 + ¹⁶

¹ Amalgamated in 1923 with the School of Dentistry of the University of Maryland.

² Affiliated in 1923 with the University of Cincinnati.

³ Discontinued in 1852.

⁴ It is uncertain whether the students graduated in 1851 or 1852.

⁵ Discontinued in 1856. The Faculty then organized the Pennsylvania College of Dental Surgery.

⁶ The property was destroyed by fire in 1855 and the School discontinued, the attendance having been too small to encourage its reestablishment.

⁷ There are no available records of the number of graduates, although it is known that the number was very small. Among the graduates (1853) was W. W. Allport, a distinguished Chicago practitioner, who in 1881 was one of the founders of the Stomatological Section of the American Medical Association (page 5), and in 1883 of the Chicago Dental Infirmary, now the Dental School of Loyola University of Chicago.

⁸ United in 1909 with the Dental School of the University of Pennsylvania.

⁹ The Dental School of Temple University since 1907.

¹⁰ The Dental School of New York University since June, 1925.

¹¹ The Dental School of Washington University since 1892.

¹² The name was changed at short intervals successively to the Dental Department of the Homeopathic Medical College of Missouri and to the Dental Department of the Missouri Medical College. Classes were graduated until 1875, when the school was discontinued.

¹³ The first permanent dental school in a university and associated with a medical school.

¹⁴ Although the School was opened in November, 1861, its work was interrupted by the Civil War, but was resumed in 1867. The School was discontinued in 1877. A successor having the same name was organized in 1899, and became the Dental School of Tulane University in 1909.

¹⁵ The Dental School of Tufts College since 1899.

¹⁶ The total number of dentists in the United States in 1870 was 7839.

d. Statistical data regarding the dental schools in existence when public regulation of dental practice was begun in 1868

The name, location, year of establishment, year of initial graduation of students, and number of graduates, of each of the dental schools founded in the United States from 1840 to 1868, are given in Table 1 on page 42. During this period, the annual number of graduates of these schools rose slowly from 2 in 1841 to 89 in 1868; and the cumulative total numbers of graduates up to 1850, 1860, and 1870 were, respectively, 115, 532, and 1305. The total number of dentists in the United States in 1870 was 7839. "

e. Influences that terminated the apprenticeship system of dental training, and initiated public regulation of the practice of dentistry

Before 1868 there were no special educational prerequisites to the study of dentistry and practically no legal restrictions of its practice. During the thirty years from 1840 to 1870, the number of active dental schools in the United States slowly increased to ten, but the total number of their graduates during the whole of that period was only 1305; and in 1870 the proportion of graduates in the total number of practitioners was certainly less than 15 per cent. Many of the dentists of this period were notoriously incompetent and irresponsible, and their superficiality and commercialism evoked earnest protests from their self-respecting colleagues. The earliest dental societies formally recorded the desire and purpose of their founders to "elevate the profession from the degraded condition to which it had sunk," and the objects of the American Society of Dental Surgeons, as stated in its constitution, included the aim "to give character and respectability to the profession, by establishing a line of distinction between the truly meritorious and skillful, and such as riot in the illgotten fruit of unblushing impudence and empiricism."

For nearly three decades after the establishment of the first dental school, the efforts of the better trained and more earnest dentists to prevent continual increase in the number of unworthy and unscrupulous practitioners were comparatively unsuccessful. By 1867, the year in which the Harvard Dental School was established, conditions had grown serious enough to demonstrate that relief from an intolerable situation could not be obtained without recourse to state control. In December, 1841, shortly after the opening of the first dental school's second year, Alabama enacted a law that nominally restricted dental practitioners in that state to those who were formally adjudged by medical examiners to be qualified, but the law was indifferently enforced. For nearly three decades, nothing more was accomplished to control the practice of dentistry, but in 1868, Kentucky, New York, and Ohio, under the guidance of progressive dentists, enacted statutes that put the practice of dentistry within their respective boundaries under public defensive regulation.

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The original Alabama statute, which was adopted in December, 1841, and became operative a year later, provided that applicants for admission to the practice of dentistry should be examined and licensed by "medical boards of the state," under the general restrictions that applied to admission to the practice of medicine, but no educational qualifications were specified. Enforcement of these provisions seems to have been neglected from the beginning; and during the progress of the Civil War and thereafter until 1881, when a new statute was substituted, this original dental act was practically inoperative.

The original dental law of the State of Kentucky was enacted by the Legislature in February, 1868, in response to a petition from a number of resident dentists, who declared that dentistry was "a specialty of the healing art"; that "at least two years of close application to study with competent instructors" were necessary for the acquisition of adequate knowledge and proficiency; and that "the people of this Commonwealth are being grossly imposed upon by the merest pretenders to dental science, without possessing a knowledge of the first principles requisite to its successful practice; hence much suffering, discomfort, and ill health, results that might and should be averted." The first Kentucky statute incorporated the Kentucky State Dental Association and authorized the Association to appoint a Board of Dental Examiners having power to license graduates of dental schools without examination, and also any others found by examination to be competent. This plan followed that long in vogue for the control of medical practice.

The original New York statute, adopted in April, 1868, established the Dental Society of the State of New York, and gave it the duty of maintaining a Board of Censors. This Board, as the agent of the Society, was empowered to examine applicants who received diplomas from dental schools in the State of New York, and also any "student who shall have studied and practised dental surgery with some accredited dentist or dentists for the term of four years" — or for a shorter period under various specified circumstances, including an allowance of one year for "attendance at a complete course of lectures of any incorporated dental or medical college in this state or elsewhere." The Society's diploma or certificate of license was awarded to all who passed the examinations, in accordance with the analogous procedure for physicians adopted several decades earlier.

The Ohio statute, resulting from the activity of the State Dental Society and approved in May, 1868, made it unlawful for any person to practise dentistry in that state who had not received a diploma from a dental school, or who had not received a certificate of qualification from the Board of Examiners of the Ohio State Dental Society or from an associated local society; but physicians and surgeons were specifically authorized to extract teeth.

Most of the earlier dental acts empowered state boards to issue licenses, without

examination, to applicant graduates of dental schools; but all of the statutes required the boards to determine, by examination, the competency of any person who, desiring to begin practice after the enactment of the corresponding state law, had not graduated from a dental school. Cumulatively effective enforcement of the dental laws, after their adoption successively in all of the states by 1899, gradually led prospective dentists to understand that the safest as well as the best route into dental practice was through a school of dentistry, and the preceptorial method of training general practitioners consequently fell into disuse, although it survives for specialists. As recently as 1901, however, about 40 per cent of the number of dentists in the United States had acquired all of their preliminary training as apprentices; of the 28,142 dentists who, then in active practice, had been admitted since 1840, exactly 16,831 were graduates of dental schools and 11,311 were not. The largest relative number of graduates were then in practice in the District of Columbia (81.2 per cent), and the smallest in Idaho (13 per cent). The number of dentists who are not graduates of dental schools has been decreasing so rapidly that it is now probably less than 3 per cent of those in active practice.

C. THE PERIOD BETWEEN 1868 AND THE ESTABLISHMENT OF THE FIRST ASSOCIATION OF DENTAL SCHOOLS IN 1884

During the years in which enforcement of the educational requirements of the various dental practice acts gradually brought about the ascendancy of formal instruction in dental schools over the earlier preceptorial system, the demand for the training afforded by the schools became greater and more general, but the indiscriminate award of the honorary D.D.S. degree to an enlarging number of mediocre practitioners, which had been begun by the Baltimore School, was a growing menace. Attendance at the dental schools increased steadily, especially in those of lower academic quality, and, as the need for more schools developed, their number rose from ten in 1868 to twenty-two in 1884. At Harvard, where the first permanent school of dentistry in affiliation with a medical school had been established in 1867, the number of graduates during the period from 1869 to 1884, inclusive, ranged annually between 3 and 15, averaged 7, and totaled 113. Although this attendance was comparatively small, owing to advanced scholastic requirements, the general desirability of including dentistry in the university program had been clearly recognized, and by 1884 nine other universities, following Harvard's example, had founded dental schools. The years from 1868 to 1884 were notable for the fact that a large proportion of the dental schools organized during that period were created in universities. All but one of these university schools, unlike most of their independent contemporaries, have survived.

The name, location, year of establishment, and year of initial graduation of students, of each of the dental schools founded in the United States during this period, are given in

Table 2. Of the ten schools named in Table 1 (page 42) that survived after 1868, the St. Louis Dental College was discontinued in 1875 and the New Orleans Dental College in 1877. At the beginning of the academic year 1884-85, there were twenty-two active dental schools in the United States. In Canada, the first successful dental school, now that of the University of Toronto, was organized in 1875, began to graduate students in 1879, and was the only school in the Dominion until 1892. The total number of dentists annually graduated in the United States, during this period, rose steadily from 89 in 1868 to 417 in 1884; and the cumulative total numbers for 1870, 1880, and 1884 were, respectively, 1305, 3146, and 4712. The total number of dentists in the United States in 1880 was 12,314; in 1884, approximately 14,387.

TABLE 2
DATA PERTAINING TO THE DENTAL SCHOOLS IN THE UNITED STATES THAT WERE ESTABLISHED
BETWEEN 1868 AND 1884. (SEE TABLE 1)

<i>Name of School</i>	<i>Location</i>	<i>Year in which instruction was begun</i>	<i>Year in which students were first graduated</i>
Maryland Dental College ¹	Baltimore	1873	1874
University of Michigan, College of Dental Surgery	Ann Arbor	1875	1876
Western College of Dental Surgeons ²	St. Louis	1877	1878
University of Tennessee, Dental Department	Nashville ³	1877	1878
University of Pennsylvania, Dental Department	Philadelphia	1878	1879
Indiana Dental College ⁴	Indianapolis	1879	1880
Vanderbilt University, Department of Dentistry	Nashville	1879	1880
Kansas City Medical College, Dental Department ⁵	Kansas City	1881	1883
University of California, College of Dentistry	San Francisco	1881	1882
University of Maryland, Dental Department	Baltimore	1882	1883
University of Iowa, Dental Department	Iowa City	1882	1883
Chicago Dental Infirmary, Collegiate Department ⁶	Chicago	1883	1884
Minnesota College Hospital, Dental Department ⁷	Minneapolis	1883	1885
Howard University, School of Medicine, College of Dentistry ⁸	Washington	1884	1885
St. Paul Medical College, Dental Department ⁷	St. Paul	1884	1885
National University, Dental Department ⁹	Washington	1884	1885

¹ Absorbed in 1879 by the Baltimore College of Dental Surgery.

² Graduated five students in 1878 and then was discontinued.

³ Now situated in Memphis.

⁴ The Dental School of Indiana University since June, 1925.

⁵ Became the Kansas City Dental College in 1890, and was united with the Western Dental College in 1919. The Kansas City College of Dental Surgery, an illegal school that was opened in 1883 and closed several years later, was not connected with any of the dental schools in Kansas City.

⁶ Originally a graduate school of dentistry for physicians. In 1884 it was reorganized as an undergraduate dental school, and named the Chicago College of Dental Surgery, which has been the Dental Department of Loyola University of Chicago since 1923.

⁷ In 1885 it became the Dental Department of Minnesota Hospital College. In 1887, amalgamated with the Dental Department of St. Paul Medical College, which had been founded in 1884, it became the College of Dentistry of the University of Minnesota.

⁸ The first dental school for Negroes.

⁹ In 1903 it was united with the Dental School of the Columbian University, now George Washington University, but it was discontinued in 1921.

D. DEVELOPMENT OF DENTAL EDUCATION, SINCE 1884, UNDER THE GUIDANCE
OF ORGANIZATIONS ESTABLISHED FOR ITS PROMOTION

a. Rise and fall of commercialism in dental education

Most of the dental schools that were created before 1890, and now survive, were founded to meet real needs, but many, established during the past thirty-five years, were mercenary ventures which deserved the extinction that awaited them. In the early days of dental education it was found, by the commercially alert, that the ownership and conduct of dental schools could be developed into a very lucrative business. Later, the dental statutes, making graduation from a dental school a prerequisite for admission to practice, accentuated the opportunity of the proprietary college. Accordingly, with the example of honored practitioners of medicine in all parts of the country to guide them, prominent dentists established dental schools that frequently were founded primarily for private gain rather than for the educational and professional service that could be rendered through them. Most of these schools, although quite as profitable financially as their owners expected them to be, were very poor educationally and many were disgraceful professionally. In this regard dentistry made the mistake of following the leadership of medicine. Happily for dentistry, however, the degradation of dental education through unworthy commercialism seems never to have touched the depths reached in medical education; and fortunately also, for dental education, many of the commercial schools were too weak to survive for more than a few years.

The number of dental schools in the United States increased slowly, in response to normal educational demands, until about 1880. In accordance with the expanding commercial opportunities created by the growing enforcement of dental practice acts, dental schools multiplied excessively during the period from 1881 to 1900, but since 1900 their number has gradually decreased.

TABLE 3

DATA ON THE NET GAIN OR LOSS IN THE NUMBER OF DENTAL SCHOOLS IN THE UNITED STATES,
AT THE END OF EACH DECADE SINCE 1840

<i>Decade</i>	1841-50	1851-60	1861-70	1871-80	1881-90	1891-00	1901-10	1911-20	1921-25
Net gain	2	1	7	3	21	23	..	..	..
Net loss	..	..	..	..	..	..	3	6	4
Total number that survived	2	3	10	13	34	57	54	48	44

The correlation between the multiplication of dental schools and the growing number of states in which dental laws were enacted may be noted from the list of the states in the sequence and for the periods in which the original statutes became operative:

1842-70. Alabama, Kentucky, New York, Ohio (4).

1872-80. Georgia, New Jersey, South Carolina, Pennsylvania, New Hampshire, Indiana, North Carolina, Louisiana (8).

1881-90. West Virginia, Illinois, Mississippi, Vermont, Iowa, Michigan, Maryland, California, Delaware, Kansas, Minnesota, North Dakota, South Dakota, Wisconsin, Virginia, Arkansas, Massachusetts, Oregon, Florida, Missouri, Rhode Island, Colorado, Oklahoma (23).

1891-99. Maine, Tennessee, District of Columbia, Connecticut, New Mexico, Arizona, Texas, Washington, Utah, Montana, Nevada, Nebraska, Idaho, Wyoming (14).

Under the conditions that encouraged the formation of many dental schools, primarily for profit to their owners, there were chartered in Illinois alone during the period from 1883 to 1902, inclusive, the twenty-eight dental schools named below:¹

Chicago Dental Infirmary, Collegiate Department (1883); rechartered as the Chicago College of Dental Surgery (1884)	Chicago Tooth-Saving College (1892)
Illinois Dental College (1885)	Columbian Dental College (1894) ³
Northwestern College of Dental Surgery (1885) ²	National College of Dental and Oral Surgery (1895)
American College of Dental Surgery (1885) ²	Standard Dental College (1896)
Northwestern Dental College of Chicago (1887) ²	Institutum Dentale Columbianum (1897)
University College of Dental and Oral Surgery (1887)	International College of Dental Surgery (1898)
University Dental College (1887) ²	Illinois School of Dentistry (1898) ³
German-American Dental College of Chicago (1888)	American University of Medicine and Dentistry (1901)
Chicago College of Dentistry (1889)	Chicago Post-graduate School of Prosthetic Dentistry (1901)
American and European Dental College (1890)	Prairie State College of Dental Surgery (1901)
United States Dental College (1890)	American Post-graduate College of Dentistry (1902)
Illinois College of Dentistry (1891) ³	Haskell Dental College of America (1902)
Northside Dental College and Infirmary (1892)	Haskell Post-graduate School of Prosthetic Dentistry (1902)
North American College of Dental Surgery (1892)	Union Dental College (1902)
Northern College of Dental Surgery (1892)	

Some of the dental schools of this period were busy diploma mills, which, created under the sanction of indifferent state laws, conducted with the collusion of unworthy dentists, and protected by unfaithful practitioners in posts of public responsibility, freely sold the degree of doctor of dental surgery at home and abroad, to the disgrace of the profession and to the dishonor of dental education. One of these schools, selling its diploma for ten dollars, found a ready market in Germany. Fortunately, when the import of this situation was fully comprehended, organized dentistry promptly brought

¹ Most of these chartered schools were never organized and in some instances practically identical corporations obtained more than one of the charters.

² The Dental School of Northwestern University was organized in 1891 under the charter of the University. The School acquired the equipment of the University Dental College (1887-91), and absorbed both the American College of Dental Surgery (1885-96) and the Northwestern College of Dental Surgery (1884-97).

³ The Dental School of the University of Illinois was organized in 1913 by absorption and reorganization of the Illinois School of Dentistry (1898-1912), which succeeded the Columbian Dental College (1894-98).

it to an end; but remembrance of these circumstances clings tenaciously to the reputation of American dentistry in Europe, where the most damaging consequences of these shameful conditions were experienced.

Many of the dental schools that were chartered since 1884 have been so completely worthless that presentation here of data similar to those in Tables 1 and 2 would serve no useful purpose. Registers of the existing dental schools are given in Part VI, and in the Appendix.

Early in the decade beginning in 1901, disgust with the quality of many of the dental schools, and opposition to increase in their number, became very general, and the multiplication was abruptly halted. Of the charters of dental schools in Illinois alone, seventeen were canceled in 1902, three in 1903, one in 1904, and one in 1905. Now there are only three dental schools in Chicago. This anomalous dental situation, regrettable as it had been, was rectified more promptly than the similar state of demoralization in medicine in Illinois, for in 1910 the Bulletin on Medical Education in the United States and Canada, issued by the Carnegie Foundation, referred to Chicago, with its eighteen medical schools, as "the plague spot of the country in respect to medical education," where, with the indubitable connivance of the state board, the provisions of the medical practice act of the state had long been and were then being flagrantly violated.

The dental practice acts have been effective agents for the elimination of commercial dental schools, and in many states have been properly adapted to that public purpose. Most of these statutes have been amended occasionally since 1890, so as to include, among many new provisions, additional safeguards against the admission of incompetent candidates to the practice of dentistry. The later protective regulations in this regard require the state boards to determine, by examination, the fitness of all applicants and to admit to license examinations only graduates of "reputable" dental schools. The statutory regulation of dental practice and of dental education is discussed in Chapters III and VI, respectively.

Increasing requirements in equipment, supplies, teaching, and research, in the natural evolution of dental education, not only have made it impossible legitimately to derive financial profits from the management of dental schools but also have necessitated the accumulation of endowment funds or their equivalent for the effective continuance of normal development. Dental education has ceased to be a profitable business, and as a consequence, proprietary dental schools have been steadily retiring from the field. Only three remain. This gratifying situation has developed through the cumulative constructive efforts, at successively higher levels, of the National Association of Dental Examiners (page 35), the American Dental Association (page 33), and the special national organizations for the advancement of dental education named in the succeeding section.

b. Cumulative general influence of the special associations for the advancement of dental education

1. *Organizations which, with the Canadian Dental Faculties Association, were amalgamated in 1923 as the American Association of Dental Schools*

(a) *National Association of Dental Faculties (1884-1923)*

For nearly forty-five years the dental schools in this country conducted their affairs not only without effective coöperation but also in many respects in undesirable competition, much of which gradually acquired outstanding commercial import. In 1884 when there were twenty-two active dental schools, and a strong trend toward rapid and unnecessary increase in their number had developed, the desire for direct coöperation among the better schools became strong enough to suggest the organization of a general association of dental schools. Accordingly, on August 4, 1884, representatives of ten of the schools then existing in the United States, who assembled in New York pursuant to a public call for a meeting to "bring about the adoption of a uniform standard of graduation," established the National Association of Dental Faculties, in which the schools were the units of membership.¹ Mandatory powers were assumed, meetings were held annually, and the proceedings were regularly published in pamphlet form. Canadian schools were admitted to membership. For nearly thirty years after its organization, the Association was the most influential executive agency for the general promotion of dental education in this country. Its relation to the development of the dental curriculum is indicated in Chapter VII. In 1923, when it was amalgamated into the American Association of Dental Schools, its membership included twenty-eight of the total of fifty-one dental schools in the United States and Canada. Of this number nine were independent schools, two were schools in groups of associated professional colleges, one was affiliated with a university, and sixteen were integral parts of universities.

In 1901 the National Association of Dental Faculties voted to lengthen the dental curriculum, beginning in 1903, from three to four years based on completion of two years of study in a high school. Before the new requirement went into effect, the Harvard Dental School, one of the members, preferring a higher grade of preliminary education to an increase in the extent of professional training, determined to raise its educational requirement for admission to a standard approximately equal to that for entrance to Harvard College, and declined to lengthen the professional curriculum from three to four years. When the Association formally disapproved this action, Harvard resigned its membership. After a year's test of the new conditions involved in extending the period of professional study from three years to four years, many of the schools threatened to withdraw from the Association if the dental curriculum were not promptly reduced to its previous length. The threat of disruption of the Association became so strong that, to

¹ See the footnote on page 117. The Association of American Medical Colleges was not organized until 1891.

meet the emergency, a special meeting was called during the summer of 1904, when it was voted to restore the three-year curriculum, and also to increase the academic year from seven months to thirty teaching weeks of six days each, beginning in 1904. The Harvard Dental School did not reënter the Association.

(b) Dental Faculties Association of American Universities (1908-23)

During the next four years various mandates of the National Association of Dental Faculties, which were expressive primarily of the commercial influence of the independent dental schools then in a large majority, not only created cumulative dissatisfaction, particularly among representatives of state universities, but also induced several additional dental schools in universities to resign their membership. These conditions suggested to the dissenting schools the desirability of joint action for the support of university ideals and methods of professional education. Accordingly, on July 31, 1908, in Boston, representatives of the six dental schools at California, Harvard, Iowa, Michigan, Minnesota, and Pennsylvania, founded the Dental Faculties Association of American Universities, with the avowed object of promoting dental education by resisting proprietary control, by making it a function of universities, and by furthering higher standards of preliminary education. This Association, in which again the units of membership were the schools, was aggressive in its advocacy of these purposes (page 104). It assumed advisory authority only, held annual meetings, for ten years regularly published its transactions in a dental journal and in pamphlet form, and lately issued its *Proceedings* complete in one volume. It did not elect Canadian schools to membership. This Association was chiefly responsible for the recent advance in the minimum entrance requirement from graduation from a high school to completion of at least one year of approved work in an accredited academic college, or the equivalent, which is now in force in twenty-eight of the forty-four dental schools in this country and in all of the schools in Canada. In 1923, the Dental Faculties Association of American Universities, when amalgamated into the American Association of Dental Schools, comprised the thirteen dental schools at California, Columbia, Harvard, Illinois, Iowa, Michigan, Minnesota, Nebraska, Ohio State, Pennsylvania, Tufts, Washington, and Western Reserve.

(c) American Institute of Dental Teachers (1893-1923)

The National Association of Dental Faculties, in effect an association of the administrative officers of the dental schools, was concerned chiefly with matters of administration, methods of instruction receiving very little attention. Appreciation of the need for better teaching in operative dental technology led fifteen teachers from eleven dental schools, in conference in Chicago, on August 18, 1893, to organize the National School of [Association for] Dental Technics. Membership was limited to the faculties of the dental schools, including the Canadian, that were members of the National Association of Dental

Faculties. Subsequently all reputable schools were eligible. Decisions were advisory only, meetings were held annually, and the proceedings were published regularly in pamphlet form. At first, special attention was given to methods of teaching operative and prosthetic dental technology, but a broader view of the demands of dental teaching induced the members in 1898 to change the name of the "School" to Institute of Dental Pedagogics, and in 1914 to American Institute of Dental Teachers.

The Institute was notable for its constructive discussions of the dental curriculum, for its encouragement of higher attainment in dental teaching, and for the harmonizing influence among the officers of the Canadian and American schools that annual fraternization of the teachers at its meetings exercised in general. The Institute maintained this excellent influence because its decisions were advisory only. As the Institute did not attempt to direct or control the administration of the dental schools, disagreements in its affairs were chiefly if not wholly academic in character, and salutary in their effects. An *Index of the Periodical Dental Literature*, an important aid in the study of the literature of dentistry and particularly valuable to teachers, originated and edited by Dean Arthur D. Black of the Northwestern University Dental School, was published occasionally under the auspices of the Institute, and has been continued by the American Association of Dental Schools, with the aid of private subscriptions and supported by grants from the Research Commission of the American Dental Association (page 159). In 1923, when the Institute was amalgamated into the American Association of Dental Schools, practically all of the dental schools in Canada and the United States were members.

2. American Association of Dental Schools (1923-)

During the summer and fall of 1922 there arose, among the dental schools in the United States and Canada, a general desire for unification of efforts to advance dental education. In accordance with this sentiment, five officially instructed and empowered delegates each from the Canadian Dental Faculties Association, the American Institute of Dental Teachers, the National Association of Dental Faculties, and the Dental Faculties Association of American Universities, in joint session in Omaha, on January 23 and 24, 1923, unanimously amalgamated these bodies provisionally into the American Association of Dental Schools. As stated in its constitution, this Association was organized "to facilitate intercourse and conference among teachers of the dental sciences and arts in North America; to promote advancement of teaching and research in American schools of dentistry; to encourage thorough study and discussion of the needs and problems of dental education; to improve public understanding and appreciation of the quality and value of dentistry; and to maintain dental education in full accord with the highest requirements of professional education in the public service." The Association, which combines the good qualities of the Institute and the older associations of faculties, is international in character and spirit, non-mandatory in authority, and devoted pri-

marily to the advancement of teaching. At its first special session, held in Cleveland, on September 11, 1923, the provisional consolidation was made permanent. The Association has held successful annual meetings in Chicago since 1924, and has published successive volumes of its *Proceedings*.

This amalgamation brought into the American Association of Dental Schools all of the Class A and Class B dental schools and the two endowed dental dispensaries in the United States, and all of the dental schools in Canada. It unified the administrative and teaching forces in dental education in North America; eliminated all causes of reasonable disagreement among the schools except such as are inherent in the real problems of dental education; provided exceptional opportunity for unprejudiced consideration of procedures of administration and methods of teaching; and improved the accord, in the Dental Educational Council of America, between the representatives of the associated schools and of the national organizations of examiners and practitioners.

3. *Dental Educational Council of America (1909-)*

For a number of years, particularly during the period when commercialism was rampant in dental education, important disagreements disturbed the relationships between the National Association of Dental Examiners and the National Association of Dental Faculties. Thus, in a variety of ways the associated examiners had been recognizing dental schools that were not regarded as reputable by the associated faculties, and had been challenging the reputability of some of the schools, and condemning the commercialism of others, that were members of the National Association of Dental Faculties. The examiners also objected to the issuance of diplomas at other times than those of the regular commencement exercises, and exacted of individual schools certain entrance and graduation requirements that conflicted with the rules of the associated faculties. In 1906 these and related differences led, at the request of the examiners, to the appointment of a standing Joint Conference Committee, for the attainment of mutual understanding and accommodation, with "power to bind the actions of both Associations" during the intervals between their annual meetings. In 1907, in order to ensure accuracy in compilation, there was also appointed a Joint Standing Committee on Tabulation of the annual results of the license examinations, expressed in terms of the percentages of each school's applicant graduates who failed to pass at their initial attempts—data that the examiners had been using in their independent determination of the reputability of individual dental schools, but which the associated faculties insisted had been recurrently and seriously in error. The appointment of these joint committees promoted greater accord between the two associations but did not remove all of the causes of friction. In 1908, the associations voted additional mandates in support of the joint committees, and thereby gave further impetus to the dissatisfaction that facilitated the organization of the Dental Faculties Association of American Universities (page 51).

In 1909, at the annual meeting of the National Association of Dental Faculties, where the members discussed the possible further improvement of the relations between the associations of examiners and faculties, special attention was given to the recent achievements of the Council on Medical Education of the American Medical Association. The discussion included suggestions of a similar development of authoritative supervision and guidance of dental schools, under the joint auspices of the associations of examiners and faculties. In this spirit, a committee of five of the National Association of Dental Faculties, appointed to consider the possibility of such coöperative procedure, met a similar committee representing the National Association of Dental Examiners. The prospect presented by this conference appearing to be favorable, and the general desire for united action having been informally demonstrated, the two committees without waiting for further instructions proceeded forthwith, on August 3, 1909, at Old Point Comfort, Virginia, to organize themselves into the Dental Educational Council of America. An invitation to the National Dental Association, to appoint five delegates to represent that body in the Council, was accepted before the next annual meeting. There was an important difference between this Council and the one for medical education: the Council for dentistry was organized as an independent body of representatives of the three national associations of examiners, schools, and practitioners, with a constitution of its own, whereas that for medicine was a standing committee of the national association of practitioners. This difference has continued to the present time.

From 1910 to 1921, the Council consisted of five delegates each from the National Association of Dental Examiners, the National Association of Dental Faculties, and the National Dental Association. The American Institute of Dental Teachers was not included because a large majority of the faculties were assumed to be represented in the Council by the delegates from the National Association of Dental Faculties. The Dental Faculties Association of American Universities, ignored at first but later urged to accept representation, for a time declined to coöperate with the Council. During 1922 and 1923, however, three delegates from the Dental Faculties Association of American Universities were seated in the Council, which in 1922 was enlarged to eighteen members, and later in the same year to twenty-four members.¹ Since the permanent organization of the American Association of Dental Schools, in September, 1923, the Council has consisted of six delegates each from that Association, the National Association of Dental Examiners, and the American Dental Association.

The Council has concerned itself chiefly with the promotion of higher scholastic and administrative standards, and the improvement of the curriculum in dental schools. These purposes have been advanced through publicity in annual reports to the bodies

¹ In 1922, when three delegates from the Dental Faculties Association of American Universities were seated in the Council, the total representation for the two associations of faculties was 8, but for the associations of examiners and of practitioners it was only 5 each. The total membership was then temporarily raised to 24 by increasing the delegations of examiners and of practitioners to 8 each.

represented in it and, since 1918, by periodical classifications of the dental schools in the United States into classes A, B, and C, grade C signifying lack of educational and professional reputability. The achievements and influence of the Council are considered in Chapters VI and VII.

E. EVOLUTION OF GENERAL REQUIREMENTS IN DENTAL EDUCATION

The character and rate of advancement of some salient minimum requirements in dental education in the United States, as reflected in the main from the rules of the National Association of Dental Faculties, are shown in Table 4.

TABLE 4

SUMMARY OF DATA ON THE EVOLUTION OF SOME GENERAL MINIMUM REQUIREMENTS AS ENFORCED IN A MAJORITY OF THE DENTAL SCHOOLS

Calendar period	Academic requirement for admission	Length of the academic year			Length of the dental curriculum	
		Calendar period	Time		Calendar period	Academic years
			Months	Weeks		
1840-85	None	1840-85	3-5		1840-85	2 ¹
1885-97	"Rudiments of an English education"	1885-96	5		1885-91 1891-03	2 ² 3
1897-99	Equivalent to that for admission to a high school ³	1896-99	6			
1899-02	Completion of one year of high school study ³	1899-04	7			
1902-07	Completion of two years of high school study ³	1904-09		30 ⁴	1903-04 1904-17	4 3
1907-10	Completion of three years of high school study ³	1909-		32 ⁴		
1910-17	Graduation from a high school ³					
1917-24	Graduation from a four-year high school (15 college entrance units) ³				1917-	4
1924-	One year of approved work in an accredited academic college; based on graduation from a four-year high school ³					

¹ Five years of dental practice, before admission, was accepted from 1840 to 1885 as equivalent to one academic year of work in a dental school. The courses of lectures were repeated annually during this period.

² Dental practice before admission was no longer acceptable as an equivalent of any part of the dental curriculum. The two-year curriculum was graded and extended thereafter through two "separate" years, without repetition of lecture courses.

³ "Or its equivalent," which was often interpreted to mean very much less.

⁴ Teaching weeks of six days each, exclusive of holidays.

⁵ In 1922 this standard was announced by the Dental Educational Council as a minimum requirement for its Class A rating, beginning in 1926-27; in 1924, as a minimum for its Class B rating, beginning in 1926-27. The standard has been in force in a majority of the schools since 1924-25—in 23 of a total of 44, in 1925-26.

CHAPTER III

SENTIMENTAL DEFINITIONS AND ANALYSIS OF THE PRACTICE OF DENTISTRY

A. LEGAL STATUS OF THE PRACTICE OF DENTISTRY

a. Definitions and scope of dental practice

The practice of dentistry is a broad term which includes the diagnosis, prevention, and treatment of diseases of the teeth and the oral cavity, and the maintenance of the oral cavity in a state of health and beauty. It is a profession which requires a high degree of skill and knowledge, and is subject to the same standards of conduct and ethics as other professions.

PART II

PRESENT MAIN FEATURES OF DENTAL EDUCATION IN THE UNITED STATES

SECTION A

CONDITIONS OF THE PRACTICE OF DENTISTRY THAT DETERMINE ITS EDUCATIONAL REQUIREMENTS

The conditions of the practice of dentistry that determine its educational requirements are the nature of the work, the complexity of the tasks, the responsibility involved, and the public interest. The practice of dentistry is a highly skilled and technical profession, and the public has a right to expect a high standard of care. The educational requirements for dentistry must be designed to ensure that the dentist is qualified to perform his duties in a safe and efficient manner.

b. Definition and scope of dental practice

The dental profession is a broad term which includes the diagnosis, prevention, and treatment of diseases of the teeth and the oral cavity, and the maintenance of the oral cavity in a state of health and beauty. It is a profession which requires a high degree of skill and knowledge, and is subject to the same standards of conduct and ethics as other professions. The dental profession is a highly skilled and technical profession, and the public has a right to expect a high standard of care. The educational requirements for dentistry must be designed to ensure that the dentist is qualified to perform his duties in a safe and efficient manner.

The dental profession is a broad term which includes the diagnosis, prevention, and treatment of diseases of the teeth and the oral cavity, and the maintenance of the oral cavity in a state of health and beauty. It is a profession which requires a high degree of skill and knowledge, and is subject to the same standards of conduct and ethics as other professions. The dental profession is a highly skilled and technical profession, and the public has a right to expect a high standard of care. The educational requirements for dentistry must be designed to ensure that the dentist is qualified to perform his duties in a safe and efficient manner.

CHAPTER III
STATUTORY DEFINITION AND REGULATION OF THE
PRACTICE OF DENTISTRY

A. LEGAL STATUS OF THE PRACTICE OF DENTISTRY

a. Basis for its public control

THE practice of dentistry, in all parts of the United States, is now regulated by statutes enacted under the so-called police power of the states, whereby legislatures, in promoting the general welfare, may prohibit acts or practices that are immoral, or that subvert the peace or comfort or impair or threaten the health of the citizens; and may secure the people against the consequences of ignorance, incapacity, deception, or fraud. The courts have very generally sustained the right of a state to prescribe uniformly the requirements for admission to the practice of any type of health service within its boundaries, and to determine how the possession of the necessary qualifications shall be established, provided each is appropriate and attainable by reasonable degrees of application and effort. This right has been upheld on the broad ground that since any mode of health service, if ignorantly or ineffectually conducted, may endanger the welfare of those to whom it is applied, its practice can be safely entrusted to such persons only as are learned, trained, and skilled in the art. Therefore, among the prescribed requirements for admission to the practice of any kind of health service, a state may include specified attainments in preliminary education as well as in professional training. In accordance with these principles, no one may practise dentistry in a given state without a license from its official dental representatives; but a license to engage in such practice in one state does not automatically confer that right in another.

b. Definition and restrictions of dental practice

The dental statutes, in general, are alike in prescribing qualifications that imply possession of sufficient knowledge, training, and skill for the safe and reliable practice of dentistry; and also in empowering appointive officers to determine the fitness of individual applicants for permission to engage in dental practice, and to issue licenses therefor to all persons legally entitled to receive them. The statutes differ somewhat in the details of their specifications as to the nature of dentistry and of the particular acts that constitute its legal practice. Collectively they declare, in effect, that dentistry consists of the art of

(a) preventing, curing, or alleviating conditions of disease, and of repairing defects, of teeth, jaws, or closely adjacent oral tissues, by hygienic, surgical, medicinal, and mechanical treatment or procedure; and, by similar means, of

(b) preventing, removing, or diminishing the consequences of deformity, derangement, or abnormal relationship, of teeth, jaws, or closely adjacent oral tissues; and of

(c) obtaining impressions and models for artificial restorations or mechanical modifications of dental or oral parts that have been rendered deficient, or which have been removed, by disease, accident, violence, or surgical intervention, including the functional and esthetic placement of the appliances or substitutes.

The dental laws do not specify the anatomical boundaries beyond which dental procedures may not be carried, nor do their definitions of dental practice clearly include operations or treatment in such adjacent regions as the maxillary sinus or the nasal passages. The statutes do not indicate that practice of dentistry comprehends medicinal treatment of systemic disorders which affect, or result from diseases of, the teeth or adjacent oral tissues, yet a dentist may lawfully place a patient in a state of complete general inhalation anesthesia. On the other hand, the extra-oral procedures in the construction or manufacture of "artificial restorations or mechanical modifications of dental or oral parts" are not included in the statutory definition of dentistry, and obviously may be conducted for dentists by any one competent to do so. The wholesale manufacture of artificial teeth in many varieties, and of other substitutes and appliances for selective use by dentists, is now an important industry. Some of the laws expressly state that their provisions do not prohibit "an unlicensed person from performing merely mechanical work upon inert matter in a dental laboratory." In conformity with these permissive conditions, much of the extra-oral work in reparative dentistry is now commonly done for dentists effectually and economically by unlicensed technicians or assistants. Some of the statutes provide for the licensing of trained assistants in the intra-oral procedures of dental prophylaxis (page 73).

c. Dentistry as delimited by decisions of the courts

1. Acts that constitute the practice of dentistry

Decisions of courts on the character of dentistry, and the scope of its practice, have varied not only with the particular provisions of individual statutes, but also with the facts involved in special cases. In one instance (*State v. Faatz*, 83 Conn. 300; 76 Atl. 295, 1910), a court observed that it "could not indorse the position that performing a dental operation is the same thing as engaging in the practice of dentistry." Within the meaning of the statute, a student of dentistry cannot be said to engage in the practice of dentistry "until he embarks in it, until he holds himself out as a dentist," either by a series of continuous acts, covert or open, or by advertising himself in some way as a dentist or as a doctor of dental surgery. "If he holds himself out to the public as a duly qualified dentist, embarked in the profession, and offers to practise as such, this would be engaging in the practice of dentistry within the true sense and meaning of the act, even though his first patient had not yet called."

It has been determined (*State v. Thompson*, 48 Wash. 683; 94 Pac. 667, 1908) that the mere "taking of an impression" is practice of dentistry, because the impression in the case before the court was obtained for the purpose of correcting a malformation of a jaw by inserting a tooth in place of the one removed. In a similar state of facts (*State v. Newton*, 39 Wash. 491; 81 Pac. 1002, 1905) it was said that "whether or not making the teeth or taking the impression would, each separately or together, constitute practice of dentistry, we do not decide. But, taken together with the actual fitting and adjustment to the jaws, we hold that it constitutes a 'correction of malposition of the jaws' within the meaning of the statute." In another opinion (*State v. Sexton*, 37 Wash. 110; 79 Pac. 634, 1905) it was concluded that the appellant practised dentistry because he cleaned the teeth of the patient and removed tartar therefrom, examined them to give an estimate of the cost of "having them fixed," and "sounded" and "picked" them. Courts have found (*People v. De France*, 104 Mich. 563; 62 N. W. 709, 1895, and *State v. Faatz*, 83 Conn. 300; 76 Atl. 295, 1910) that "a 'dentist' is one whose business is to clean, extract, or repair natural teeth, and to make and insert artificial ones."

2. Dentistry and medicine not sharply differentiated in the scope of their legal practice

Dentistry and medicine are regulated by separate legislative acts in all of the states, but the two types of practice have not been clearly differentiated. In some of the states, physicians are expressly exempted from the operation of the dental laws, and may practise dentistry as a part of the practice of medicine; in other states, they may practise dentistry incidentally, but not as a specialty without a dental license. Where such exceptions or limitations are not indicated, the extent of the legal right of a licensed doctor of medicine to practise dentistry without a dental license is doubtful. On the other side, the restrictions in the medical acts against extension of the practice of dentistry into that of medicine have not been definitely stated, nor have they been clarified by the numerous specifications in the dental statutes of the acts that a dentist may lawfully perform. Dentists are not permitted, by the medical laws, to practise medicine beyond the scope of dentistry, which, however, the medical laws do not define; and therefore it is uncertain, in many states, whether a dentist, without a license to practise medicine, may legally conduct all of the operations of oral surgery, or administer drugs systemically for their remedial effects in the mouth. But custom has been establishing distinctions on the borderlines that statutes have not recognized.

The courts have disagreed in their judgments on these important questions. Thus, in one instance (*State v. Beck*, 21 R. I. 288; 43 Atl. 366, 1899), it was declared that any one licensed to practise medicine and surgery also had the right to practise dentistry as a branch of surgery, irrespective of the restrictions in the separate dental statute; that dentistry is a well-recognized branch of surgery; that a dentist is a dental surgeon who performs surgical operations on the teeth and jaws, and "as incidental thereto upon the flesh

connected therewith"; and a dentist's sphere of operations, accordingly, is included in the larger one of the physician and surgeon. In the view of the court it has always been the custom for physicians to treat ailing teeth, to extract teeth, and to perform various other professional services that technically come within the purview of dentistry. Inasmuch as physicians who reside in the country towns particularly have always been called upon for the performance of such dental service, to prohibit them from continuing thus to treat their patients would cause great inconvenience, and often extreme hardship and suffering for patients. Any construction of the law that would prevent general practitioners from treating any part of the human body, or restrict them in the discharge of their professional duties, the court stated, would be a menace to the public health, and would deprive physicians of the right to practise a branch of their profession that is as old as the history of medicine itself.

In a second illustrative case (*State v. Taylor*, 106 Minn. 218; 118 N. W. 1012, 1908), the court reasoned to the contrary — that a license to practise medicine and surgery did not confer upon the holder the right to practise dentistry, which could not be lawfully undertaken by any one without a specific license in accordance with the requirements of the dental act of the state. The legislature had defined medicine and dentistry as two distinct professions, in the obvious belief that men who engage in the treatment of diseases of the dental organs should receive special preparation and be licensed to practise that particular branch; and a state board of dental examiners had been created and authorized to determine who should be licensed to practise dentistry in the state. A department of dental surgery had been established at the state university expressly to afford effectual training for the specialty of dentistry, which was recognized by the award of a special professional degree. Although this training included a considerable part of the work required in the medical school, it also comprehended studies relating particularly to disorders of the dental organs and courses designed to ensure efficiency in the mechanical work connected with the treatment of dental diseases. All of this, in the opinion of the court, clearly indicated that, "for reasons of public policy," dentistry was not a part of medicine within the meaning of the statute.

It has not been established that certain procedures on the borderline between general surgery and dental surgery should be regarded solely as practice of medicine. In one decision (*in re Carpenter*, 196 Mich. 561; 162 N. W. 963, 1917), the court ruled that, in "administering antiseptic and anesthetic drugs," in a case of cancer of the mouth, a dentist did not practise medicine within the meaning of the medical statute, for a licensed dentist was qualified to give such treatments to one suffering from "diseases or lesions of the human teeth or jaws."

3. *A dentist is not a physician*

Whether a dentist is a physician, within the meaning of the medical statutes, has been

considered by the courts in a few instances from additional points of view. In one case (*State ex rel. Flickinger v. Fisher*, 119 Mo. 344; 24 S.W. 167, 1893), where the dental act did not specifically confer exemption from jury duty, the court held that "a dentist is not a doctor," and could not claim such exemption on the ground that he was a practitioner of medicine. This opinion was rendered by a divided court, four of seven judges concurring, but three united in the dissenting opinion, which included the following significant views:

"In the cities and more populous districts we now find the functions formerly exercised by the doctor, or practitioner of medicine of the olden time, divided up and exercised by specialists, each confining himself generally to the practice of a particular branch or department of the science, such as surgeons, dentists, oculists, aurists, etc. While dentistry, as an independent calling may have had an humble and comparatively recent origin, it has now become a very important branch of medical science, and there are but few who have arrived at the age of those who are usually called to serve as jurors who would not testify that when the exercise of its functions becomes necessary it is as exigent as the exercise of most of the other functions of the general practitioner. The fact that this branch of the medical profession has grown to such proportions as to have its own independent colleges, and to confer its own degrees, and that it has become necessary that its practice should be regulated by statute . . . indicate the importance of the exercise of its functions to the public welfare. The fact that it is regulated in a separate article and as an independent calling from that of an M.D. does not in any manner affect the character of those functions."

Again, the provisions in medical statutes that prescribe a privileged character for all of the personal information a physician may acquire in his professional capacity, and which prohibit its disclosure, have been construed to be inapplicable to dentists, who from the point of view of the specifications in the medical statutes are not practitioners of medicine or surgery. In an announcement of this finding (*People v. De France*, 104 Mich. 563; 62 N.W. 709, 1895), the court noted that the terms dentist and surgeon are not interchangeable. If a dentist were a surgeon, within the meaning of the medical act, it would be because "his business as a dentist" is a branch of surgery; but a dentist is one "whose profession it is to clean and extract teeth, repair them when diseased, and replace them, when necessary, by artificial ones," which, it was inferred, is neither medicine nor surgery.

B. ENFORCEMENT OF THE DENTAL PRACTICE ACTS

a. Determination of the qualifications of prospective practitioners

1. By direct examination

In any state, one of the most important aspects of the problem of protecting citizens against the consequences of inept practice of dentistry, is the determination that the individual applicant for a license has had suitable preliminary education and adequate professional training, and is in fact competent and trustworthy. This function, essentially

if the societies fail to present nominations. Where the examiners are assistants to special lay bodies for law enforcement, they are appointed by the latter. The terms of the members of the boards are usually five years in length, and do not expire simultaneously. In many states members may be reappointed for an unlimited number of terms; in other states, no one may serve for more than two successive terms. The governors may remove members of boards for such causes as criminality, immorality, incompetency, or neglect of duty, or are directed by law to do so; and usually may fill vacancies under all of the legal conditions that affected original appointments.

Obviously a state dental board should be an able, faithful, courageous, and judicial body, competent and well disposed not only to advise the state on every aspect of oral health-service, but also to determine the general quality of a dental school, to establish suitable educational prerequisites for admission to its examinations, to ascertain the acceptability of all applicants for the license, to protect the citizens against the activity of unethical practitioners, and to rescind a license when a dentist ceases to merit the privilege to practise under its authority. When state boards of dental examiners were first established, and for years afterward, most of the dental schools were rival business concerns, and openly used commercial methods to advance the financial interests of their owners. Many of the teachers at these schools could not be trusted, in license examinations, to pass judgment fairly on the graduates of their own colleges or of competing schools, and dental practice acts or other regulations in most of the states made all of the teachers ineligible for membership in the boards. This disqualification has become traditional. The gradual conversion of nearly all of the dental schools into integral parts of universities has removed the original basis for the automatic discrimination against the members of dental faculties. The growing importance of the functions of state boards, as examiners, executives, or advisers, or all of these, and the increasing need for close coöperation between the boards and the good schools, suggest that any system of selection that debars many of the most competent dentists from membership in the boards, and excludes them from this form of altruistic service for the state, is opposed to the public welfare.

2. Desirability of improvement in the license examinations

In many states the license examinations are notable for high degrees of competency and earnestness. In some, however, they are inadequate or conducted superficially. Because of wide variations, in the standards of qualification for practice, the examinations collectively lack interstate equivalence. In a few states the examinations show partiality for or prejudice against the graduates of certain schools, lack discrimination and reliability, and fail to represent the progressive aspects of dental practice. Determination of what an applicant for a license can do and how well he does it, rather than what he may

remember perhaps for the day, should be the primary objects of a license examination in dentistry. It should consist of a broad and direct precautionary enquiry into the candidate's proficiency in the art of oral health-service as already certified by the school from which he graduated, and of his capacity to apply its scientific principles under the variable and complex conditions of actual practice. Written tests should be regarded as incidental in value and subordinated accordingly. The recurrence of particular questions year by year, in the written examinations conducted by some of the boards, has become well known to dental students. Competent examiners can ascertain all that is significant, for a proper rating, through searching tests that include problems of diagnosis and procedure. A candidate who does not have a good working understanding of the principles known to be involved in practical situations cannot pass such an examination; but, even if he *knew* all about dentistry and yet were unable to *do* effectually its essential tasks, the award to him of a license, the board's certificate of proved proficiency and acceptability as a *practitioner*, would be indefensible. The occasional selection of competent teachers to membership in state boards; intimate accord between the boards and the faculties of the better schools, for mutual guidance and to prevent waste of time and effort in duplicate tests; and greater emphasis on determinations of ability to practise dentistry as a thorough integration of arts and sciences—in which the so-called fundamental sciences blend as indistinguishable parts—are among the most obvious means to increase the usefulness of the state boards.

3. *Need for the highest type of ability, integrity, and disinterestedness in the membership of the boards of dental examiners*

The license examinations would be particularly effective agencies for the general advancement of the practice of oral health-service, if every board of dental examiners consisted only of members of the highest personal and professional character and ability, who were notable for their comprehension of the quality, needs, and responsibilities of progressive dentistry. License examinations by such a body would invariably accord so closely with public requirements and educational progress in oral health-service, that graduates of schools with inferior admission requirements, ineffective organization, inadequate facilities, inept teaching, indifferent application of laboratory observations to practical conditions, and insufficient correlation between clinical dentistry and clinical medicine, would consistently fail to pass. Deficient schools, whatever their repute, would be obliged on this account alone to attain efficiency or to discontinue. Public registry of the acts of the boards relating to all examinations would discourage abuses of discretion, and would facilitate corrective measures against injustice or error.

Unfortunately, the state boards have not always been selected on this plane. The public functions of the individual members of the state boards have not been given their

true evaluation by the dental profession, which has failed seriously to note the indirect consequences of its unconcern for the proper performance of these duties. Many appointments to membership in state boards continue to be purely personal or obviously political. Private desire to protect the interests of poorer schools has developed powerful and selfish concerns in some low-grade selections for state board memberships. It has been widely observed that many examiners do not and cannot appreciate the requirements of modern dental practice. Yet, instead of close attention to the selection of the examiners as the most important representatives of the conscience and public fidelity of the organized dental profession, there has been a general indifference to the conditions and methods of their designation, and a similar disregard for the performance and significance of their functions. Although state board memberships afford special means for altruistic endeavor and for expressions of the finest spirit of a health-service profession, they have been left too often to the devices of those who seek to use them for ignoble purposes. Organized dentistry should insist that the duties of the state boards of dental examiners be taken as seriously and executed as effectually as their importance requires, and that the work of the boards be given commensurate financial support. Appointments to membership should be raised appropriately to the plane of accredited opportunities for professional distinction in unselfish public service. Dentists everywhere should be alert to the fact that the public official representatives of dentistry, as its personal exponents, formally reflect not only the quality of dental practice, but also the intelligence and character of dentistry as a profession.

c. Educational import of the licensing function of the examining boards

The statutes usually prescribe that the boards of dental examiners may admit, to the license examinations, only graduates of "reputable" dental schools. This restriction carries the implications that the graduates of reputable schools are acceptable, but that those of schools of ill repute cannot be desirable. It is obviously essential that practitioners of dentistry should be not only well educated and adequately trained, but also honorable and public-spirited. Such men and women do not seek diplomas from dental schools that are lacking in repute, or which are notably inferior, or which do not deserve respect. Therefore, the character and standing of all of the schools are current conditions of prime importance for determination by each state board. The educational significance of the legal powers of the state boards in the indirect regulation of dental education, and in the exercise of authority to exclude from the license examinations all graduates of unworthy dental schools, receives attention in Chapter VI.

C. IMPORTANT OPPORTUNITIES OPEN TO THE NATIONAL ASSOCIATION OF
DENTAL EXAMINERS TO EFFECT IMPROVEMENTS

a. Significant status of the Association

The National Association of Dental Examiners exercises an important general advisory influence on the work of the state boards. It initiated and has steadily supported the movement against commercialism in dental education, which is about to culminate happily in the extinction of the proprietary school (page 107). The ideals of the most influential examiners have given the Association, through its general activities, a momentum for progress that the inertia of the most indifferent examiners has not halted. The Association is a voluntary organization of groups of state officials who are, above every other consideration, individually charged with the responsibility to use their dental wisdom for the welfare of the state in the field of their profession, and especially to protect the public in the respective commonwealths against the consequences of ignorance, incompetency, commercialism, and fraud in oral health-service. Realization by many individual examiners, and by some boards, of their paramount official status as public servants, has not been intimate by any means. The Association should be particularly conscious of its opportunity, by recurrent self-examination and self-criticism, to elevate the standard of quality and achievement of the individual state boards. Continued development of conscientiousness and of *esprit de corps* in the state boards of dental examiners, under the leadership of the Association, is desirable from every point of view of public interest. The future general progress of dentistry and of dental education rests largely within the sphere of influence of the National Association of Dental Examiners.

b. Desirability of improvement and uniformity in the dental statutes

The force behind the enactment of the earlier dental statutes, when the preceptorial method of training dentists prevailed, was the purpose to improve the quality of dentistry by ultimately restricting its practitioners to *graduates* of dental schools. Subsequently, when commercialism degraded the quality of many of the schools, moral leadership in the profession demanded that licenses be issued only to graduates of *reputable* schools. Lately, with the rapid elimination of commercialism from dental education, and the impending extinction of unacceptable dental schools, the prevailing statutory requirement of reputability has lost its original practical importance, for all of the schools will soon be reputable. Inasmuch as some of them may continue to be *poor* in quality, however, the new problem for the states in this relation is that of licensing graduates of *good* schools only, and of requiring applicants for the license to pass examinations commensurate with the instruction in such schools and with the requirements of progressive dentistry. The

Association may be expected to meet its responsibility in this regard, and to suggest corresponding improvements in the statutes, in the state board procedures, and in the practical relations between the boards and the schools.

An urgent public need, which the Association might endeavor to meet, is the authoritative publication of the collected dental laws in force in the United States, with a supplementary model statute. On matters as to which important disagreement existed, alternative provisions for a model statute might well be presented with clarifying explanations. Such a volume would be particularly useful to state boards, legislatures, governors, public-health officials, dental faculties, and dental and medical practitioners, especially if, brought up to date occasionally, it were also supplemented by annual or biennial issues of an official digest of legislative amendments, together with collateral matter of major importance for state boards, including revisions of the standing model law. This illustrative statute, with its alternative provisions, could be made a coordinated repository of the experience and wisdom of the state boards and their advisers, and would serve, with the editions of the collected laws and the issues of the digest, as a reliable basis for acceptable legislation — a very important factor heretofore in the progress of dentistry.

c. Need for uniform national examinations as a basis for suitable interstate exchange of licenses

Desirable freedom of opportunity for competent dentists to engage in practice in any state would seem to be most satisfactorily attainable, from the point of view of public welfare as distinguished from the personal convenience of dentists, through the agency of an accessory system of uniform national examinations. This should be conducted on a plane high enough to ensure approval of only such persons as would certainly be able to practise dentistry in accordance with the most advanced legal requirements. License examinations of uniformly high grade, approved by the most exacting state boards, and conducted by a national board of dental examiners in an advisory relationship, preferably under the auspices or with the active coöperation of the National Association of Dental Examiners, would be a reliable foundation for an interstate exchange of an increasing number of qualified practitioners of universal acceptability. A national board of dental examiners might also devise and conduct the most suitable and economic examinations of prospective specialists, who at present may publicly announce themselves as being superior to general practitioners in particular branches of oral health-service without having to demonstrate, to an examining board, the validity of such claims (page 200). The abuses of this privilege have become notorious.

CHAPTER IV
TYPES, NUMBER, AND DISTRIBUTION OF
DENTAL PRACTITIONERS

A. TYPES OF DENTAL PRACTITIONERS

a. Dentists or dental surgeons

1. *General practitioners*

At present all persons who have been licensed to practise dentistry in its entirety are known as dentists or dental surgeons. The number of general practitioners who continue actively to represent the era of training by apprenticeship has become very small, but a large proportion of these, in recognition of their professional attainments, received honorary awards of the degree of Master of Dental Surgery, or of Doctor of Dental Surgery. Graduation from a reputable dental school is now a statutory requirement for admission to the dental license examination in practically every state. All of the existing dental schools are undergraduate institutions having curricula which, with a few exceptions, are adapted for the training of general practitioners only. The need for the well-trained, broad-minded, widely experienced, and keenly sympathetic general practitioner will steadily increase rather than diminish, and his achievements, whether as counselor or operator, will continue to be the foundation of oral health-service.

2. *Specialists*

Although every dentist has been licensed to practise dentistry in general, each is free to restrict his practice to any part of it, and, without further examination by the dental representatives of the state or without a new license, may represent himself as an expert operator in any oral specialty. In the exercise of this privilege many dentists now devote their attention exclusively to such phases of the practice of dentistry as correction of dental alignment and occlusion (orthodontia), surgery of the jaws and mouth (oral surgery), direct treatment of diseased conditions of the tissues immediately adjacent to the teeth (periodontia), and adjustment of artificial dentures (prosthodontia), and are known respectively as orthodontists, oral surgeons, periodontists, and prosthodontists. These groups, and others, maintain corresponding national societies.

Sincere specialization in dentistry has been attained chiefly by self-training or by private instruction, or both. The dental schools, following the example of the medical schools, have been trying to crowd "everything" into the undergraduate curriculum, with the proverbial lack of success. In most instances, instead of training intensively for general practice or thoroughly for specialization, the schools have done neither. The instruction has been amplified to redundancy and very little opportunity has been afforded for mature specialization. By ignoring the need for graduate instruction, the schools with

few exceptions have exposed the training of specialists to general commercial exploitation, and as a consequence independent proprietary "post-graduate" concerns have been doing a lucrative business, dental supply-houses have been conducting "advanced" courses in dentistry through the agency of plausible salesmen, and individual dentists for extortionate fees have become itinerant lecturers to groups of trustful general practitioners. Dental societies, striving to meet the need, actively and sometimes very earnestly conduct short courses of special instruction for their members, and their meetings are often featured with "teaching clinics," but such measures, despite their emergency value, are superficial and inadequate. The obligation of the dental schools in universities to provide systematic graduate curricula for the training of specialists of all types of oral health-service, including teaching, research, and public-health work, is clear and urgent. The statutory regulation of the practice of dental specialties, to ensure proficiency, should be quite as definite as that for general practice, but the dental profession and especially the state boards of dental examiners are indifferent to this phase of their responsibility, and the public is unaware of frequent impositions on its confidence (page 200).

3. *Circumstances affecting selection and award of the two current professional degrees in dentistry*

Before 1840, dental practitioners used such titles as "doctor," "dentist," "surgeon-dentist," and "dental surgeon," according to their individual conceptions of advantage or propriety. In 1840, the American Society of Dental Surgeons formally sanctioned the use of the title "dental surgeon," and conferred upon its members the degree of Doctor of Dental Surgery, which was abbreviated to D.D.S. (page 34).

The Baltimore College of Dental Surgery was empowered by its charter to grant the degree of Doctor of Dental Surgery to its graduates and to practitioners worthy of the distinction. In 1841, the College conferred the D.D.S. degree upon two graduates and also began to use it as an honorary award, many of the members of the American Society of Dental Surgeons receiving it from the College. In 1843, by what appears to have been an informal understanding with the College, the Society ceased to award the degree. As designated by the College on its diploma in Latin, the degree was *Chirurgiae Dentium Doctoris*; but the English equivalent was used in all other relations. Nearly all of the schools, following the example of the first, have awarded the D.D.S. degree to their graduates (page 73).

In 1869, the prospective award of a professional degree to the first graduates of the Dental School of Harvard University occasioned special discussion of the degree that might most suitably be conferred by a university, all previously existing dental schools having been without any academic affiliations. Most of the members of the Harvard dental faculty were doctors of medicine, and some of them favored award of the M.D. degree to the graduates in dentistry. Others suggested *Scientiae Dentium Doctoris*, which

would have justified the continuance of "D.D.S.," but this was rejected on the ground that dentistry was not a science. A compromise on a medico-dental degree, to constitute a distinctive title for the dental branch of the healing art, led to the selection of *Dentariae Medicinae Doctoris*, which has been conferred upon all of the graduates of the Harvard Dental School from the beginning. Of the remaining dental schools in the United States, only those of Tufts College and North Pacific College of Oregon confer D.M.D. rather than D.D.S. on their graduates in dentistry.

The University of California, enacting a new plan beginning in 1928, will substitute the B.S. or B.D.Sc. degree for the D.D.S. degree (page 266).

b. Dental or oral hygienists

1. *Legal status*

Since 1914 more than half of the number of states and also the District of Columbia have amended or revised their dental laws to include specifications of acts in the conventional practice of dentistry that collectively represent a phase of hygienic treatment (oral prophylaxis), and which, while continuing to be a part of the practice of dentistry, also constitute the auxiliary practice of dental or oral hygiene. These supplemental statutory provisions were originated to expand the regulated practice of dental prophylaxis as a means of oral health-service in particular and of health conservation in general. In order to promote practice of this part of dentistry by persons who though not dentists have been taught its hygienic procedures, and yet to safeguard the larger interests of the patients, these extensions of the dental statutes prescribe comparatively simple conditions for admission to the practice of dental hygiene, but place it *entirely under the supervision of individual dentists*. In most of the statutes, licensed practitioners of dental or oral hygiene are designated dental or oral *hygienists* rather than *nurses*, because, instead of helping chiefly to treat or cure disease, they practise means designed primarily to prevent it.

2. *Origin and evolution of the practice of dental hygiene as an auxiliary of the practice of dentistry*

(a) Preliminary suggestions

The practice of dentistry, like that of medicine, may be made more useful and extensive with the aid of assistants. Before 1907 this obvious fact, relating not only to laboratory technicians but also to unlicensed assistants in general, prompted occasional public suggestions of the desirability of training lay women to conduct, in a capacity analogous to that of the conventional nurse, some of the simpler intra-oral procedures. A number of practitioners independently trained a few assistants for this type of coöperation; but, until recently, fear that "dental nurses" would pervert the responsibilities of such an auxiliary practice, and belief that it could not be performed by unlicensed persons without violation of existing statutes, prevented general adoption of these useful suggestions.

(b) Early events in Connecticut

(1) *Evolution of the practice of dental hygiene*

The development of the practice of dental hygiene by lay assistants, as a lawful auxiliary of dentistry in the United States and Canada, was a direct outcome of the successful application of dental hygiene in the private practice of Alfred C. Fones, D.D.S., of Bridgeport, Connecticut. In 1899, inspired by demonstrations of the great advantages of dental prophylaxis for the patient, as made by D. D. Smith, D.D.S., of Philadelphia, Dr. Fones further evolved a system of instrumentation and polishing of the teeth for that purpose, which he used until 1905. Originally he believed that the prophylactic procedures, which are simple in technique but inordinate in their exaction of time, might be entrusted to an assistant, so that the dentist's attention could be devoted wholly to more difficult service. In 1905, acting on this opinion, Dr. Fones taught the technique to his chair assistant, Mrs. Irene Newman, who in 1906 began prophylactic work for his patients, and as a dental hygienist has been in continuous practice in Dr. Fones's office ever since.

In 1907 prospective new provisions of the Connecticut dental statute made it unlawful for dentists to use unlicensed assistants in their operative work. As Chairman of the Legislative Committee of the Connecticut Dental Association, Dr. Fones advocated the addition of a clause to the effect that dentists might employ unlicensed trained assistants for prophylactic service *in the immediate presence of and directly under the supervision of registered or licensed dentists*, which, having been adopted, was the first legalization of the auxiliary practice of dental hygiene by operators who are not licensed dentists.

The striking degree of benefit accruing to patients from the systematic application of dental prophylaxis suggested to Dr. Fones the desirability of oral health-service for the children in the Bridgeport public schools. After numerous unsuccessful efforts to convince the city officials that such a project deserved their support, \$5000 were appropriated in 1913 for a test of its value.

(2) *First training school for dental hygienists*

Inasmuch as it was impossible to inaugurate the proposed service in the schools before a sufficient number of dental hygienists had been trained for the purpose, Dr. Fones, in 1913-14, with the aid of eighteen distinguished teachers of biological or medical sciences and practitioners of dentistry or medicine, accomplished this object by conducting, in a part of his office building, the first training school for dental hygienists. Among the lecturers was M. L. Rhein, M.D., D.D.S., of New York City, who independently suggested, before 1900, that women be trained as "dental nurses to cooperate with dentists in cleaning and polishing the teeth, massaging the gums, and applying remedial agents . . . under specific prescriptions and directions of the attending stomatologists."

In the announcement of the course, issued in September, 1913, it was said in part:

"In the last few years, there has been a great demand for women as hygienists and prophylactic operators in dental offices, for it is a well known fact that at least 80 per cent of dental diseases can be prevented by following a system of treatment and cleanliness. There is also now developing a demand for these women in public institutions such as schools, hospitals, and sanatoriums. . . . At the present time there is no standard educational course for dental hygienists. The demand for these women throughout the country is sufficiently large to warrant a course of lectures to be given by men who are authorities in their various specialties, these lectures to be printed in book form. . . . With the possibility that this movement will be a powerful aid in the prevention of disease, these educators have agreed to give their services gratis. . . . After the lecture course there will be six weeks of practical training in dental prophylaxis. . . . A nominal fee of twenty dollars will be charged to partly cover this expense."

There were no educational requirements for admission to the School, but the first class, consisting chiefly of experienced dental assistants and school teachers resident in Connecticut, contained three college graduates, three trained nurses, and the wives of three practising dentists. On November 17, 1913, thirty-three women over twenty-one years of age began the course, and on June 5, 1914, twenty-seven were graduated as dental hygienists. The course was repeated in 1915-16 and in 1916-17, when the success of more pretentious courses elsewhere made its continuance inexpedient.

(3) *Oral health-service for school children at Bridgeport, Connecticut*

With the aid of ten of the first group of dental hygienists, and the moral and financial support of the city, the proposed test of the usefulness of oral health-service for school children was initiated in the fall of 1914. In order to give the test a sound statistical basis, it was planned to continue the work through a five-year period, so that a large group of the same children progressing from the first to the fifth grade could be subjected to the experimental influences for a comparatively long period, and the resultant conditions compared with those of a fifth-grade "control" class which had not been given the prophylactic treatment. The results showed, for example, that the incidence of dental caries in the permanent teeth of fifth-grade children on the dental hygienic program was reduced 33.9 per cent during the first five-year demonstration (1914-19). In the fifth-grade group of these children in 1920, the reduction was 49.6 per cent. During the year 1921, the children had access for the first time to a municipal clinic for filling the permanent teeth, and the reduction was 69.3 per cent. Throughout the tests the general health of the pupils was noticeably improved and retardation in their school work was considerably diminished. As a consequence of this successful demonstration, the absence of unfilled cavities in the permanent teeth has been a prerequisite since 1921 for promotion from grade five to grade six in the Bridgeport schools, and compilation of the dental records of the children subjected to the hygienic treatment has been discontinued.

In 1915, there was an average of 5.5 cavities per child in the permanent teeth of 1946

untreated fifth-grade children. The accompanying data, for more than 2000 fifth-grade children who received the attention of hygienists, indicate the general dental conditions annually since 1918.

DATA PERTAINING TO THE PERMANENT TEETH OF CHILDREN IN THE FIFTH GRADE

Year	Average number of cavities	Year	Average number of cavities
1915 ("control" class)	5.5+	1922	2.8
1918	5.2	1923	2.8
1919	4.3	1924	2.5
1920	3.4	1925	2.5
1921	3.04		

The comparative examinations on which these observations are based were not confined to children who were just completing five years on the dental hygienic program, but included all of the children in the fifth grade, many of whom had attended Bridgeport schools but a comparatively short time.

These demonstrations of the importance of dental prophylaxis as a means of reducing the incidence of dental disease, of promoting the general health, and of improving the intellectual status of school children, have awakened a strong interest in preventive dentistry for children (pages 79 and 231). Repetitions of the tests elsewhere have confirmed the findings.

(4) *Original dental-hygiene practice act*

In 1915, Dr. Fones proposed the adoption of the following amendment to the Connecticut dental statute, which, having been promptly enacted, for the first time legally outlined the field of operations of the dental hygienist, and served as a precedent:

"Any registered or licensed dentist may employ women assistants, who shall be known as dental hygienists. Such dental hygienists may remove calcareous deposits, accretions, and stains from the exposed surfaces of the teeth and directly beneath the free margins of the gums, but shall not perform any other operation on the teeth, mouth, or any diseased tissues of the mouth. They may operate in the office of any registered or licensed dentist, or in any public or private institution under the general supervision of a registered or licensed dentist. The dental commission [state board of dental examiners] may revoke the license of any registered or licensed dentist who shall permit any dental hygienist operating under his supervision to perform any operation other than that permitted under the provisions of this section."

In 1917, this section was amended to provide for the registration and licensing of all dental hygienists then in practice in Connecticut, and to require the examination of dental hygienists desiring to practise in that state thereafter.

(e) *First university courses for dental hygienists*

The second training school for dental hygienists, but the first to exact a definite educational requirement for admission, the first to become a part of a university, and now the

oldest in continuous service, was founded by Louise C. Ball, A.B., D.D.S., a member of the faculty of Hunter College, New York City, who in 1916, with the aid of experienced teachers and of dental and medical practitioners, and supported by a grant of \$2500 from the Rockefeller Foundation, established the New York School of Dental Hygiene. At the conclusion of a preliminary summer course at Hunter College, during July and August of that year, the School became an organic part of the Vanderbilt Clinic of Columbia University. Since March, 1917, its function has been continued at Columbia by the Department of University Extension, in Courses in Oral Hygiene, which are now given chiefly in the building of the Dental School. One of the practitioners who helped to establish the School, and was chiefly instrumental in obtaining the supporting fund from the Rockefeller Foundation, was Dr. M. L. Rhein, whose coöperation with Dr. Fones in the establishment of the first school for dental hygienists was mentioned on page 74. Dr. Fones, as a lecturer and demonstrator (1918-22), was also among those who helped to develop the work of the second school for dental hygienists.

The first announcement of the New York School of Dental Hygiene contained the statement that it was "in spirit and purpose, a school of preventive medicine." The initial requirement for admission was "evidence of attendance for one year in a high school." The course, open only to women at least nineteen years of age, was a full academic year in length. The preliminary summer course was taken by sixty-five women, of whom forty-five were students at Hunter College. Ninety-six women began the course in September, 1916, of whom eighty-one graduated in June, 1917, and passed the license examination given by the State Board of Dental Examiners. Dr. Ball continued to direct the courses until the close of the year 1917-18. Under her guidance prospective dental hygienists were first given bedside instruction in the wards of a hospital (Roosevelt), and also practice in teaching dental hygiene in public schools.

(d) First schools for dental hygienists in dental infirmaries

In 1916, shortly after the initiation of the work of the New York School of Dental Hygiene, similar schools were established in the Rochester Dental Dispensary, at Rochester, New York, and in the Forsyth Dental Infirmary for Children, at Boston, the first of which is now affiliated with the School of Medicine and Dentistry of the University of Rochester, and the second with the Dental Schools of Tufts College and Harvard University.

Courses for dental hygienists are now given by or in association with eleven dental schools. The entrance requirement is graduation from a high school. In most cases the curricula extend through one year; in some, through two years.

(e) Extension of the auxiliary practice of dental hygiene

Dental hygiene has become an auxiliary of the practice of dentistry, by legislative enactment, in Alabama, Arkansas, California, Colorado, Connecticut, the District of

Columbia, Florida, Iowa, Louisiana,¹ Maine, Massachusetts, Michigan, Minnesota, Mississippi, New Hampshire, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Vermont, Washington, West Virginia, Wisconsin, and Wyoming. In many of these states, by an unnecessary legal limitation, in accord with the Connecticut precedent, licenses for the practice of dental hygiene may be issued to women only.

At its annual meeting in 1922 the American Dental Association adopted a draft of a model law regulating the practice of dental hygiene, "for adoption by states not already having legislation on this subject." In this model statute it is provided that a dental hygienist may "remove calcareous deposits, secretions and stains from the exposed surfaces of teeth, and prescribe and apply any ordinary wash or washes of a soothing character, but may not perform any operation on the teeth or other tissues of the oral cavity." No one may practise dental prophylaxis before he or she is nineteen years of age and is duly licensed by the state's dental officers. To be licensed to practise dental hygiene, the applicant must have had "a general education equivalent to at least a one-year course beyond that of the eighth grade of the elementary school"; must have graduated from "a reputable training school for dental hygienists" having a curriculum not less than thirty-two weeks in length; and must have passed a license examination to include the subjects of anatomy, bacteriology, dental pathology, histology, physiology, and preventive dentistry, and also "practical demonstrations in dental hygiene." Dental hygienists may be employed by "boards of education of public or private schools, county boards, boards of health, or public or charitable institutions operating only under the general supervision of one or more licensed dentists, and may also be employed in any dental office . . . provided that their number . . . shall not exceed . . . the number of licensed dentists operating therein; and they may also, under the direction and supervision of licensed dentists, act as assistant instructors in a school for the training of dental hygienists . . . [but] shall not otherwise engage *in practice* as dental hygienists."

Dental hygienists have established not only local and state societies, but also the American Dental Hygienists Association, which, sponsored by the American Dental Association, was organized in September, 1923, holds annual meetings in affiliation with the general association of dental practitioners, and promotes the advance of oral hygiene. There are now about 1750 dental hygienists in active practice in the United States, and the number promises to increase rapidly.

In addition to the direct practice of dental prophylaxis as specifically regulated by law, in association with dentists in private or institutional relationships, the field of usefulness of the dental hygienist has been extended to include the teaching of general hygiene, oral hygiene, dietetics, sanitation, and health habits to individual patients, and to assemblies of children, mothers, industrial workers, and other groups in need of instruc-

¹ Although there is no specific statute relative to dental hygiene, the State Board of Dental Examiners of Louisiana has authority to examine applicants for the license.

tion in the ways and means of health promotion. The service of the dental hygienist, at the forefront in the defensive struggle against disease, has been attracting educated women of strong humanitarian instincts, and enlisting the participation of school teachers, trained nurses, and religious, charity, and welfare workers. Oral hygiene, steadily growing in utility and appreciation, deserves the special attention of all of the universities containing dental schools.

Among the foundations of dental health, which are included in those of general well-being and which current information enables the dentist to influence, especially in coöperation with physicians, are normal pre-natal development, adequate diet during the period of growth, and physiological conditions in the mouth from infancy. But, without the inheritance of a constitution and of an oral structure that are favorable, and without advantageous nervous and chemical coördinations in general, which are not yet controllable, even perfect mastery of the conditions of pre-natal development, diet, and dental environment may not avail to repel the early incidence of oral maladies. Nevertheless, complete prevention of disease is the ideal of dental service; the means at hand should be used to the full in every sincere practice; and research should be extended in all directions for the wider information that would afford greater power to ward off disability. Meanwhile, "preventive dentistry for children" is the most urgent general responsibility of the dental profession, which can be met most effectually by close accord between pediatrics and dentistry. In helping parents to protect children in their birthrights of general health and vigor, and also to assure adequacy of diet and favorable oral conditions, the dental hygienists, by wisdom in private counsel and in public instruction, by judicious collaboration with school nurses and other public-health workers, by sympathetic alertness in personal observations, and by skill and capacity in actual practice, may become very useful factors in the attainment of these desiderata. The maternal instincts of women make them ideally adapted for this fundamental health service. It is to be hoped that dentists will endeavor to increase, among women, due appreciation of the opportunity for usefulness in the career of dental hygienist.

There is a widespread fear among dentists that dental hygienists will be inclined to violate their obligations, and independently to extend their practice beyond the statutory confines. Proper education of the public, as to the functions of the dental hygienist and regarding the limitations of the practice of oral hygiene, would prevent all but occasional abuses. There appears to be no more real danger that dental hygienists will pretend to be dentists than there is that dentists will assume the rôle of physicians.

B. DENTAL TECHNICIANS

Dentists having the larger opportunities for health service, whether engaged in general or special practice, need the coöperation not only of licensed dental hygienists, but also

of a number of unlicensed assistants, among them dental technicians, who are often called "dental mechanics" and sometimes improperly designated "mechanical dentists." A dental technician prepares in a laboratory, on specifications derived by a dentist from conditions in the mouth of a patient, various articles for ultimate placement in the mouth of the patient by the dentist himself (page 81). The usefulness of the dental technician, and the limitations on his helpfulness to the dental practitioner, have been indicated in a general way in the Introduction (page 12).

When a dentist attends to all of the details of his practice, a large proportion of his time must be devoted, in extra-oral handwork, to the preparation of a variety of substitutes and appliances to be fitted into the mouths of his patients. To do all of this laboratory work properly himself, the dentist must limit the number of his patients to the requirements of that mechanical labor and to his capacity. When such accessory manufacture requires half of the total period of his working time, for example, not more than half is available for personal attention to patients. If, however, all of the necessary reconstructive appliances in his practice were made satisfactorily for him in a general laboratory, or by a whole-time technician in the dentist's own laboratory, he could devote all of his working time to direct service for his patients and could treat approximately twice as many; and, by such concentration, probably could give a higher quality of personal service. It is a fair presumption, also, that the remuneration for such technical assistance is never equal to the amount of a dentist's proper fee for the corresponding period of time given by him to direct personal service. Therefore, the aid of competent dental technicians in dental practice is desirable from every private or public consideration of financial economy, professional opportunity, and personal health service. Physicians refer their medicinal prescriptions to pharmacists; surgeons perform personal operations but technicians make crutches, braces, and artificial limbs; ophthalmologists serve patients diagnostically or surgically but opticians make the needed glasses and artificial eyes. Why, then, if competent technicians are available to do most or all of the laboratory work, should dentists, who have opportunity to devote all of their attention to intra-oral procedures, expend on the manufacture of appliances the time they could give to more difficult, more important, and more urgent personal service for patients? In the smaller towns and in the rural districts, where the number of patients may be too small to keep dentists economically occupied unless they do their own laboratory work, dentists may not be able to employ assistants, or to pay for appliances made to their order in technical laboratories. In the larger towns and in the cities, however, the demand for the coöperation of expert dental technicians is increasing and their helpfulness is expanding. In the present dental curriculum, some of the excessive attention to dental technology is based on survival of views that originated years ago when most dentists, then chiefly dental mechanics, were given relatively little else to do than to make reconstructions, and had plenty of time in which to prepare them. Instruction in the details of mechanical technology suffi-

cient to render the student competent either to teach himself to become expert in laboratory work, or to enable him wisely and with complete mastery to direct technicians, is the happy medium that most dental schools would do well to seek.

The present status of the dental technician, his growing importance in the economical practice of dentistry, and the need for improvement in his training, were recently indicated very directly by Professor Thomas Cowling, of the Dental Faculty of the University of Toronto, in comment that applies generally to conditions in the United States as well as in Canada (*Oral Health*, 1924; xiv, pp. 278-279, July):

"The position of the dental mechanic [dental technician] is a rather paradoxical one. He makes most of the intricate and complicated prosthetic restorations, yet receives no instruction from our dental teachers. A dentist, on the contrary, receives four or five years of detailed instruction from expert teachers, yet seldom follows a case farther than the impression and bite stage. We do not like to admit it, but it is a fact, nevertheless, that the majority of dentists never make a denture, bridge, crown or inlay. The mechanic does the work. In defence of our present system it may be contended that the training received by the dentist qualifies him to superintend the work done by the assistants, and there is, perhaps, much truth in such a statement. Unfortunately this supervision, in most cases, is more theoretical than real. The time is now opportune for a careful survey of this problem of instruction of dental mechanics. The present state of affairs is illogical and indefensible."

In a discussion of Professor Cowling's significant statement, it may suitably be said that the technician who makes "intricate and complicated prosthetic restorations," with even a fair degree of success, necessarily received instruction from some source. If ambitious, with acute mechanical intuition and well-trained hands, he probably improved on the work of his instructors. Most technicians competent to perform "intricate and complicated" work have either attended a dental school and become technicians from choice or force of circumstances, gradually increasing their technical skill by study and practice, or have slowly attained efficiency through years of effort and assimilation of knowledge from several or many different employers and fellow workmen. There is serious lack of facilities for the systematic training of expert dental technicians, and dentistry is greatly in need of the help of such assistants, but general tolerance of the unsuccessful attempts of many unskilled technicians to do "intricate and complicated" prosthesis accounts for many of the lamentable failures in this field.

A dentist who fails to "follow his case" through the technical stages stamps himself as mediocre, unless the work is done by a competent technician trained to execute his plans and able, on general instructions, to carry the technical work to a successful conclusion. That dentists "do not like to admit" that as much laboratory work as possible should be given to competent technicians appears to be due to the survival of outworn views of the function of dentistry. A conscientious and able practitioner does not leave to a technician the architectonics of any particular reconstruction. The dentist may

suitably consult the technician, if competent, in selecting available plans for the attainment of desired ends, and may properly be influenced by the indicated nature of the technical involvements of alternative plans. But, the plan having been selected, the technician in any well-regulated practice would and should be held responsible for all of the necessary mechanical procedures, and also required to present the work for inspection at such stages of its evolution as would enable the responsible dentist to satisfy himself that its execution was proceeding correctly or needed modification.

Shortly before his retirement from the presidency of the American Dental Association, W. A. Giffen, D.D.S., made an equally direct and informative statement on this and related subjects (*Dental Student*, 1924; ii, pp. 9-10, October):

“The ideal dental practice of the future will be established along the following lines: Location, where the dentist wishes to live, and fair play, based upon sound business principles in the reception office and courtesy in the operating room, with each diagnosis based upon a most thorough examination. The data, including history of the case, radiographic examination, study models and preliminary education of the patient, will be delegated to a *trained oral hygienist*. The dentist must perform all operative work for his patients with care. All operations for restorations, such as cavity preparation, impressions and measurements, should be made with precision. Specifications should be properly made out and referred to a scientifically *trained technician*. The dentist should not endanger his health by sitting after hours doing his laboratory work, which can be done as well or better by one trained especially to do that class of work. Many dentists are wasting time, energy and money by doing all of the routine work themselves. Would not the time consumed in such work be more profitably spent in reading dental magazines, studying, and attending dental, medical and other meetings, where valuable discussions relating to health service are carried on? Time so spent would add greatly to his store of knowledge, enabling the dentist not only to win the confidence of, but actually to render more valuable service to, his patients.”

These remarks apply also to the coöperation of all types of assistants in dental practice. Although the need for expert dental technicians is growing rapidly, organized dentistry is doing nothing to meet the emergency. The dental faculties appear to be unanimously unconcerned about it. Meanwhile, superficial proprietary “schools” for “mechanical dentists” are doing business as usual. Adequate courses in good technical schools, if developed under the guidance of local dental societies and with the coöperation of effective dental teachers, would presumably carry the problem toward its ultimate solution. Advanced courses for dental technicians, in small groups carefully selected for their special mechanical ability, might be given to advantage in dental schools, where able technicians could help effectually to increase the quantity and improve the quality of the restorative service in the infirmaries, and where practical coöperation between student practitioners and student technicians would be mutually instructive in the amenities of future relationships of this kind.

C. NUMBER OF DENTAL PRACTITIONERS

There are nearly 70,000 dental practitioners in continental United States, including about 1750 dental hygienists (December, 1925). The statistics published by the United States Census Bureau, for the last three census years, include those given here.

	1900	1910	1920
Dentists:			
Total number	29,665	39,997	56,152
Women	807	1,254	1,829
Total population	75,994,575	91,972,266	105,710,620
Average number of persons per dentist	2,562	2,299	1,882
Number of dentists per 100,000 of population	39	43	53

The data in the above summary, and in the accompanying table (page 85), indicate that the number of dentists has steadily been increasing more rapidly than the total population, and on a rising plane of requirements in both the preliminary and professional phases of dental training. The figures also suggest that there is no occasion for alarm that further reasonable improvement of dental education will seriously deplete the ranks of the profession. In 1900, when there was 1 dentist for every 2562 persons, or 39 dentists for each 100,000 of population, the minimum academic requirement for admission to dental schools, as set by the National Association of Dental Faculties, was the completion of one year of study in a high school, the academic year was only seven months long, the professional curriculum extended through but three years, and the dental degree could be obtained in three short academic years after the completion of the first year in a high school.¹ In 1920, when there was 1 dentist for every 1882 persons, or 53 dentists for each 100,000 of population, the minimum academic requirement for admission to acceptable dental schools had risen to graduation from a four-year high school, the academic year was thirty-two weeks long, the professional curriculum extended through four years, and the dental degree could not be obtained in less than seven full academic years after the completion of the first year in a high school—four years more than the number required twenty years earlier.

In the table on page 85 the census data for 1910 and 1920, for four groups of professions including dentistry, present interesting comparisons of the number of practitioners and the growth of each group during the ten years from 1910 to 1920 (Annual Report of the President of the Carnegie Foundation: 1923, xviii, pp. 44-45).

For the decade from 1910 to 1920, the data in this table show that although the increase in the total population was only 14.9 per cent, in the number of dentists it was 40.4 per cent. The group devoted to health service is numerically the largest (370,061), and its "actual increase" (89,771) was almost equal to that of the three other groups combined (92,167). The percentage increase in the number of dentists (40.4) was greater than in the numbers of physicians and surgeons (loss of 0.7), clergymen (7.8), lawyers,

¹ For graduates in 1900 and 1901, the total was one year less, and the years were one month shorter. These graduates were admissible, in 1897 and 1898, on the lower requirements in effect generally until 1899 (page 55).

including judges and justices (6.8), and auxiliary legal groups (35.3), civil engineers and surveyors (24.3), mining engineers (loss of 3.4), and the total population (14.9); but it was *less* than in the number of healers (116.2), trained nurses (81.1), religious, charity, and welfare workers (157.2), electrical engineers (77.2), and mechanical engineers (159.7). The increase of 10 in the number of dentists for each 100,000 of population, for 1920 compared with 1910, was greater than that for each of the other professions except trained nurses (51), religious, charity and welfare workers (22), and mechanical engineers (20); there were losses for physicians and surgeons (22), clergymen (8), lawyers, including judges and justices (9), and mining engineers (2).

There are no available accurate data on the number of practitioners of the several specialties of dentistry, nor of the number of dental technicians.

The numbers of dentists and dental hygienists required to conduct a full community program of preventive and reparative dentistry are everywhere inadequate, and are usually insufficient to meet the present needs of even the minority who are not inattentive to their dental condition, but the proportions are rising. Fortunately, general realization of the import of preventive dentistry, and of the life-long benefits of dental care for young children, have quickened interest in the creation of a growing number of public or semi-public agencies, chiefly under the auspices of educational and health organizations, for the wider extension of dental service, especially to children of pre-school age, to children in public schools, and to children of parents who are financially unable to pay the conventional fees of the private practitioner. Multiplication of these and similar agencies, large and small, including dental clinics in hospitals and dispensaries, not only would enhance the public value and appreciation of oral health-service, and thus impart additional attractiveness to a dental career, but also, by steadily enlarging the group of whole-time or part-time salaried dental positions, would encourage cumulative expansion in the numbers of dentists and dental hygienists until the supply of practitioners more closely approximated the demand. Benefactions such as the Forsyth Dental Infirmary for Children and the Rochester Dental Dispensary, associated with medical and dental schools and hospitals, are needed in all parts of the country for the solution of health problems that involve the coöperation of dentistry. Small dental infirmaries in community health centres would help to meet the requirements of the rural populations.

D. DISTRIBUTION OF DENTAL PRACTITIONERS

Dental practitioners, like other professional groups, are very unevenly distributed throughout the United States. Although the general ratio between the total number of dentists and total population is now 1 to approximately 1700, it is as high as 1 to 500 or less in some urban centres and as low as 1 to 4000 or more in rural communities. (See the data for the states in Part VI; also in the Appendix.)

DISTRIBUTION OF DENTAL PRACTITIONERS

85

COMPARATIVE CENSUS DATA FOR FOUR PROFESSIONAL GROUPS IN CONTINENTAL UNITED STATES

For 1910 and 1920

	1910	1920	Actual Increase	Percentage Increase
Health service:				
Physicians and surgeons ¹	151,132	150,007	1,125 ²	0.7 ²
Healers	6,834	14,774	7,940	116.2
Dentists	39,997	56,152	16,155	40.4
Trained nurses	82,327	149,128	66,801	81.1
Total	280,290	370,061	89,771	32.0
Religion and welfare:				
Clergymen	118,018	127,270	9,252	7.8
Religious, charity and welfare workers	15,970	41,078	25,108	157.2
Total	133,988	168,348	34,360	25.6
Law:				
Lawyers ³	114,704	122,519	7,815	6.8
Abstractors, notaries, justices of peace	7,445	10,071	2,626	35.3
Total	122,149	132,590	10,441	8.5
Engineering:				
Civil engineers and surveyors	52,033	64,660	12,627	24.3
Electrical engineers	15,278	27,077	11,799	77.2
Mechanical engineers	14,514	37,689	23,175	159.7
Mining engineers	6,930	6,695	235 ²	3.4 ²
Total	88,755	136,121	47,366	53.3
Total for four professions	625,182	807,120	181,938	29.1
Total population	91,972,266	105,710,620	13,738,354	14.9

COMPARATIVE NUMBERS IN EACH OF FOUR PROFESSIONAL GROUPS FOR EVERY 100,000 OF POPULATION IN CONTINENTAL UNITED STATES: 1910 AND 1920

	1910	1920
Health service:		
Physicians and surgeons ¹	164	142
Healers	7	14
Dentists	43	53
Trained nurses	90	141
Total	304	350
Religion and welfare:		
Clergymen	128	120
Religious, charity and welfare workers	17	39
Total	145	159
Law:		
Lawyers ³	125	116
Abstractors, notaries, justices of peace	8	9
Total	133	125
Engineers:		
Civil engineers and surveyors	57	61
Electrical engineers	17	26
Mechanical engineers	16	36
Mining engineers	8	6
Total	98	129
Total for four professions	680	763

¹Including osteopaths: 5030 in 1920.

²Decrease.

³Including judges and justices.

E. EFFECTS OF HIGHER EDUCATIONAL REQUIREMENTS ON THE NUMBER AND DISTRIBUTION OF DENTAL PRACTITIONERS

There is earnest objection, by some, to the requirement of a more advanced preliminary education for dentists than that represented by graduation from a high school. They hold that it is not only unnecessary for the attainment of proficiency in an art that is so largely mechanical, but also that it would diminish permanently the number of active dentists by making the profession too difficult to enter, and thus too unattractive to the many who need the special inducement of easy admission to dental practice to encourage them to undertake it. It is feared that an ensuing reduction in the number of new practitioners would prevent the distribution of dentists to every part of the country including the villages, which is now believed to be taking place cumulatively with each successive annual addition to the number of active practitioners; and, therefore, that the dental profession would be unable to continue quantitatively the service it is rendering. These assumptions of the lowly educational estate of dentistry, and of its inferior professional character, overlook important conditions. Dentistry cannot be given widespread quantitative application irrespective of its biological requirements and limitations. The value of dentistry, primarily a mode of health service, arises mainly from the sufficiency of its quality, and poor dentistry is usually worse for a patient than none. Dentistry is in effect a specialty of the healing art, and its practice must be permeated by the medical sciences. The full content of a professional training in modern oral health-service cannot properly be founded directly on a high-school education.

Those who urge that the dental curriculum should be continued on a high-school basis, in order to prevent depletion in the supply of dentists and to obviate the assumed interference with the distribution of new practitioners, also magnify the significance of the temporary losses that usually ensue from the initiation of higher scholastic requirements. They disregard the ultimate increase in the number of practitioners that may be expected to follow removal of the stigma that dentistry is an unlearned profession and therefore inferior. They ignore the circumstance that loss in the number of poorly educated and uninspired practitioners would constitute a relative gain for the profession in the character of its oral health-service, and for the public in the quality of the benefits received. They fail to appreciate the fact that uniform geographical distribution of dentists is unattainable under any normal social and economic circumstances.

The objections to an elevation of the educational and professional quality of dentistry, on the ground that such improvements might permanently diminish the number of needed dentists and prevent desirable general extension of oral health-service, would be important if well founded, but they have not been based on close observation or broad experience (page 83). Those who raise these objections have failed to give adequate answers to such pertinent questions as these:

What conditions determine the distribution of practitioners of dentistry? Is opportunity for the largest possible degree of humanitarian service, without regard for the prospective economic advancement and social contentment of the practitioner himself, the decisive influence?

Do many dentists prefer to establish their practices in towns of 1000 population or less, or in districts that are removed as far as possible from cities, and where the economic and social conditions may be uninviting but where there are special opportunities for health service that is urgently needed but will be poorly recompensed? Or do most dentists, like most professional men, prefer just the opposite: to work in larger communities where conditions are more promising for the practitioners themselves, even though the opportunity for personal health-service may not be relatively so great there as in villages, because many dentists are already on the ground in the larger fields?

If twice as many dentists were graduated in 1927 as in 1926, what proportion of the extra number would probably open offices in towns of 1000 population or less where there are now no dentists? How many dentists would have to be graduated to force at least one dentist into every village in the United States? Would the graduation of a million practitioners accomplish it? Would the ensuing excessive competition, from an overabundant supply of dentists, drive the surplus number of dentists into the villages or out of dentistry? What would the consequent overcrowding of the cities, by dental practitioners, do to the morale of dentists and to the character of dentistry?

The inevitable answers to the foregoing questions fail to support the position of those who believe that it will be necessary to base the dental curriculum directly on a high-school foundation in order to produce the needed number of dentists and to ensure their uniform geographical distribution. In the sparsely populated districts, the creation of centres for community health-service, the steady multiplication there of means for prompt telephonic communication with physicians and dentists in adjacent territory and for ready transportation to their offices, and the ability of physicians to coöperate in all dental emergencies pending early visits to dentists, are conditions in operation or in prospect that make the uniform distribution of dental practitioners to permanent locations in all of the smallest towns and rural sections not only unnecessary, but also economically and socially undesirable.

CHAPTER V

DEFICIENCY OF DENTAL SERVICE FOR THE NEGRO GROUP¹

A. DANGER TO A COMMUNITY FROM INDIFFERENCE TO THE HEALTH OF ANY PORTION OF THE POPULATION

a. Consequences of prevailing general disregard for the health of the Negro

ALTHOUGH promotion of the welfare of all by protection of the health of each has been the ideal of organized and regulated public health-service, the Negroes in many communities in the United States have been kept in ignorance of essential facts regarding personal hygiene and have been deprived of due attention in measures of public sanitation. Throughout the country generally, the colored people, allowed indifferently to shift for themselves, are frequently subjected to very unsanitary conditions and suffer excessively from disease, a large amount of which, in many forms, is freely intercommunicable among the individuals of all the racial groups. The death rate among the Negroes in the United States has lately been about 70 per cent greater than that for the white population and, during the past ten years, the Negro undertakers have increased approximately three times as fast as the combined numbers of colored physicians and dentists.

The general indifference of the white population to the welfare of the colored citizens not only violates the sentiments of fair play, decency, and humanity, but also expresses a form of racial selfishness that fails to see the ends of enlightened self-interest, for every Negro having a communicable disease is a menace to the health of all with whom he may be associated, and particularly to the well-being of those he may serve personally and intimately. Where his ailment is traceable to denial of the benefits of instruction in hygiene, or where its continuance results from lack of the remedial care that is available to all white persons, the ensuing danger to the whole community is retributive in its threat of disease and death.

b. Importance of oral health-service for the colored group

The quality of the teeth of the Negro seems to be reduced by racial admixture. The individuals of the primitive negroid type, now rapidly diminishing in number in this country, appear to be highly resistant to the development of dental and oral disorders; but the average Negro and his children, under prevailing conditions in the United States, are almost if not wholly as susceptible to such ailments as the average white person.

¹Among those to whom copies of a provisional form of this chapter were submitted for criticism was Dr. Stephen J. Lewis, of Washington, D. C., Editor of the Dental Section of the *Journal of the National Medical Association*, who, with the present writer's consent, used the copy freely in the preparation of the note regarding "Dental Schools for the Colored," on page 96 of *Polk's Dental Register* for 1925.

Dental and oral maladies, irrespective of the color of the skin, commonly injure health by interfering with nutrition, or by occasioning the conveyance of disease germs or their direct or indirect toxins to the blood, and thence to other parts of the body, with consequent production of local or general disturbances. Impaired nutrition or a local or systemic disorder, from any cause and without reference to race or color, by lowering the resistance to a variety of infectious or contagious maladies, may facilitate the dissemination of such injurious factors. Therefore, the preservation of the general health of a community is directly related to the health of the teeth and mouth of each individual of every race in its entire population.

B. NUMBER, DISTRIBUTION, AND ORGANIZATION OF NEGRO DENTISTS IN THE UNITED STATES

a. Number and distribution

Authentic information regarding the Negro pioneers in dentistry has been very difficult to trace. As late as 1885, just before the original dental school for colored people graduated its first class, when the total number of dentists in the United States was about 15,000, there were probably not more than twenty-five licensed colored dentists in this country, and less than half of this number were graduates of dental schools. Some of these practitioners became members of the original faculties of the Negro dental schools of Howard University and Meharry Medical College, the first for Negroes exclusively, which were organized in 1884 and 1886, respectively. The total number of graduates of each of the dental schools that have been devoted to the training of colored practitioners is shown in this summary:

	1885-90	1891-00	1901-10	1911-20	1921	1922	1923	1924	1925	Total
Howard University	35	32	113	282	31	27	87	47	20	674
Meharry Medical College	13	25	131	312	34	43	111	92	53	814
University of W. Tennessee ¹	..	..	..	19	6	7 ²	11	..	..	43
Total	<u>48</u>	<u>57</u>	<u>244</u>	<u>613</u>	<u>71</u>	<u>77</u>	<u>209</u>	<u>139</u>	<u>73</u>	<u>1,531</u>

Before 1900, Negro dentists were located chiefly in the South, and there were only a few in each of several northern centres of population. Colored dentists have gradually increased in number from about 125 in 1900 to approximately 1300 at present, and, in recent years, have been distributed chiefly to northern cities with the shifting masses of Negro population. The colored physicians and dentists in Chicago, Cleveland, New York City, Philadelphia, and Washington, D. C., collectively now outnumber those in all of the southern states combined. Of the number of Negro dentists now in active practice,

¹A Class C school located in Memphis, Tennessee; discontinued in 1923.

²Six of the number were Japanese. In 1925 a similar group of Japanese graduated from the Class C Texas Dental College.

fully 1000 are graduates of the dental schools of Howard University and Meharry Medical College.

b. Organization

Before 1890 there were no organizations of colored dentists, and until 1895, Negro physicians, in imitation of the prevailing attitude of physicians toward dentists generally, disregarded colored dentists as factors in health service and as a rule excluded them from professional association. But there was an important change of spirit in 1895, when colored physicians, dentists, and pharmacists organized the National Medical Association, the Dental Section of which, having approximately three hundred members from about thirty-five states, is now in effect the national association of Negro dental practitioners. Since 1908, the National Medical Association has issued a quarterly *Journal* containing a well-conducted Dental Section. The Association, which meets annually, has improved the self-respect, promoted the welfare, and elevated the status of its members, encouraged the organization of local and state auxiliary societies, and furthered the growth of professional spirit in each of these bodies.

One of the important results of these stimulating influences was an attempt, in 1905, to establish an independent national association of Negro dentists. Although this effort was unsuccessful, it encouraged colored dentists of Maryland, Virginia, and the District of Columbia, in 1913, to organize the Tri-State Dental Association, which, in 1918, by rapid accretion of state representations, became the present Inter-State Dental Association. This Association, with about three hundred members in twenty-one states in the South, East, and Middle West, holds annual meetings and maintains important activities *ad interim*. The influences that have tended to make the Inter-State Dental Association as fully national in extent as it is in spirit, are its direct concern for the welfare of the individual members; its aim to promote recognition of the professional and ethical ideals of dental practice, and of the duties of the professional man to the community he serves; its vigorous activity in public oral health-service in Negro centres, particularly in the South; its helpfulness to new colored recruits to dentistry; and its special interest in the efficiency and development of the dental schools of Howard University and Meharry Medical College, including the conduct of free lecture courses for their senior students. Thus far, Negroes have not been elected in any considerable numbers to membership in the state or national societies of dentists.

In thirty-seven states there are general organizations of colored practitioners of health service, most of which, allied with the National Medical Association, are societies of physicians, dentists, and pharmacists. In eight states, general organizations of Negro dentists are affiliated with the Inter-State Dental Association. Each of these bodies consists of a number of local societies, of which there are now a total of about thirty-five.¹

¹ Corresponding to the growth of the Dental Section of the National Medical Association, the number of state units in the Inter-State Dental Association has been diminishing. A drift toward union in the Dental Section of the National Medical Association appears to be in progress (February, 1926).

C. EXTENDED HEALTH-SERVICE EDUCATION FOR THE NEGRO GROUP AN
URGENT NATIONAL PROBLEM

a. General serviceability of the colored practitioner among his own people

Health service for Negroes in the past has often been very inferior. When not entirely neglected, it has frequently been conducted by incompetent colored practitioners, or by indifferent white ones. It is natural for sick Negroes to prefer to be treated and nursed by persons of their own group. Although under special circumstances, or in some localities, it will always be necessary and desirable for white practitioners to treat colored patients, it is obvious that the most important factors for the future general development and prospective improvement of all types of health service for Negroes will be well-trained and devoted colored men and women. The Negro practitioner of health service who is faithful to the best interests of his group, and of the community in which he resides, deservedly commands universal respect, for he is an important influence for the promotion of the general welfare. In private practice or in public health-service, and in the dispensary, infirmary, or hospital, he meets the colored patient in complete sympathy and accord as one of his kind. Through his understanding and interest, he conveys such impressions and influences for the patient's welfare in health conservation or betterment as only racial harmony between practitioner and patient could be expected, in most instances, to develop or encourage.

b. Urgent need for a larger number, and more effective distribution, of well-trained colored practitioners of health service

Health service for Negroes by Negroes is seriously undermanned. Although the ratios of white physicians and dentists to population are 1 to about 800 and 1 to about 1700, respectively, the ratios of colored physicians and dentists to Negro population are 1 to about 3200 and 1 to about 8500, respectively. In many parts of the country the general shortage in the number of colored physicians and dentists is aggravated by the natural tendency to segregate in centres where the economic and social conditions are most satisfactory for the individual practitioner. The general migration of Negroes to urban centres in the north, which has been actively in progress for some years, has included all types of practitioners of health service, and the small numbers of dentists in active practice throughout the South have been further depleted as a consequence. There is special need and opportunity for trained colored oral hygienists to coöperate with school boards and public-health authorities in the promotion of the welfare of Negroes, particularly through practical service in schools and other institutions, and by lectures and demonstrations to the colored laity. The proper education and training of an adequate number of Negro practitioners of health service, imbued with ideals of usefulness to their

group and of responsibility to their communities, and the relatively uniform distribution of such competent practitioners, are social problems of great urgency.

c. Inadequacy of the present rate of production of Negro dentists

The numbers of colored physicians, dentists, and nurses recently graduated annually have been not only inadequate for each type of service in general, but also insufficient to keep pace with the needs of the yearly increase in the Negro population. The situation affecting dentistry in particular may be judged from the fact that the total annual attendance of Negroes at the dental schools in the United States during the past six years (1919-25) was only 628, 769, 754, 712, 542, and 443, respectively. The graduates during this period numbered only 115, 88, 105, 291, 180, and 100, respectively, a total of 879, or an annual average of 146. Eighteen schools had no colored students; three had a few such students but no Negro graduates. Of the twenty-five dental schools having white and colored students, the largest numbers of Negroes were graduated during the past six years (1919-25) at these institutions:

Northwestern University	22	University of Pennsylvania	10
Temple University	20	University of Pittsburgh	9
College of Dental and Oral Surgery of New York (1919-23)	19	Loyola University (Chicago)	7
University of Minnesota	14	University of Illinois	6
Indiana Dental College	13	University of Iowa	6
Western Reserve University	11	Ohio State University	6

The number of colored graduates of the remaining dental schools, during the past six years, was only 26; and the total for all of the schools, exclusive of those of Howard, Meharry, and West Tennessee, was 169. Additional statistical data are given in the Appendix. General growth of sentiment for segregation has increased the tendency, in many dental schools, to restrict the attendance to white students, or to admit only the small number of colored students that may be useful for the treatment of a few Negro patients in the infirmary. Some of the dental schools do not permit Negroes to enter their infirmaries; others segregate colored patients, but several admit them to the infirmaries without discrimination.

D. URGENCY OF MORE GENEROUS SUPPORT OF DENTAL SCHOOLS FOR
COLORED STUDENTS

a. Dental schools of Howard University and Meharry Medical College

Of the forty-four dental schools in the United States at present, only two, those of Howard University and Meharry Medical College, are devoted exclusively to the training of colored dentists. They have been the pioneer Negro schools of dentistry. The management of each school, able and self-sacrificing, is making a determined and

faithful effort to advance the cause of dental education for the Negro group. The teachers are earnest and devoted, but their number is insufficient and their salaries are inadequate. The dental building at Howard is too small for the institution's requirements and opportunities. The lack of equipment and facilities is serious for each school, and generous financial support is urgently required for both. This need is emphasized by the further fact that Howard is unable, for lack of the necessary resources, to admit the full number of qualified students who now wish to enter the Dental School, and the effort of Negroes to serve their group is correspondingly handicapped. Additional data pertaining to these schools are given in Part VI and in the Appendix.

Howard and Meharry are national in their relationships and social significance, and in the scope and usefulness of their service, and each deserves liberal support on the basis of general concern and advantage. Enlargement and betterment of these two institutions are clearly indicated as among the most effectual ways to promote the progress of health service for the Negro group in this country.

b. Need for additional dental schools for Negroes

Economic, social, and educational conditions long conspired to prevent Negroes from entering the professions of health service. With improvement in the economic status of the colored group, however, the ability of Negroes to meet the expenses of a professional education is steadily growing. Inasmuch as prevailing sentiment for segregation prevents admission of more than a few colored students to the existing medical and dental schools attended by white students, there is evident need not only for improvement and support of such schools as are devoted exclusively to the training of Negroes, but also for an increase in their number. The creation of departments or schools for the training of Negroes in health service, in state universities or in universities having adequate endowments, should appeal strongly to the citizens of states containing large colored populations.

E. GENERAL CONSIDERATIONS

Health-service education for the Negro group deserves the attention not only of the nation generally, but also particularly of the colored population, which collectively should be aided to help itself, and urged to acquire a stronger sense of responsibility for the physical welfare of the individual. In health service, the opportunities of the pioneer are open to the intelligent and altruistic Negro. The need for generous effort in such work could be persuasively presented to Negroes wherever their advanced education is under way, and all colored men and women should be encouraged to understand that each form of health service is an important means for the direct betterment of the group as well as of individuals. The establishment of fellowships and loan funds at the best institutions, to

support the education of selected Negroes as practitioners, teachers, or investigators, would help very materially not only to solve the problems of adequate production and uniform distribution of colored physicians, surgeons, dentists, and nurses, but also to provide leadership in all divisions of health service for the Negro group.

PART II (CONTINUED)

**PRESENT MAIN FEATURES OF DENTAL EDUCATION
IN THE UNITED STATES**

SECTION B

WORK OF THE DENTAL SCHOOLS

CHAPTER VI

REGULATION OF DENTAL SCHOOLS BY STATE LAWS AND BY PROFESSIONAL ORGANIZATIONS

A. AGENCIES AND GENERAL CONSEQUENCES OF EXTERNAL CONTROL OF DENTAL SCHOOLS

At present the dental schools are directly influenced by three special external agencies: (1) The dental practice acts, which, presumably expressive of public opinion, are enforced by appointive licensing boards that cooperate through the National Association of Dental Examiners; (2) the deliberations of the American Association of Dental Schools; and (3) the public classifications of the schools and the standards set by the Dental Educational Council of America, which consists of representatives of the national associations of examiners, teachers, and practitioners.

Statutory public control of dental schools, by state boards and also through the agency of the National Association of Dental Examiners, is discussed in a general way in Chapter III. Mandatory regulation of this character usually voices conservative opinion, provides for the enforcement of minimal educational requirements for a license, and aims to prevent retrogression in professional quality. The relation of the American Association of Dental Schools to its members is advisory only. Basing its actions on intimate understanding of the limitations of the individual schools and on the needs of prospective practitioners, and seeking realization of educational ideals in the public interest, the Association urges persuasively the early adoption of the highest attainable standards of all types. The Dental Educational Council exercises its influence, in relations that are intermediate between the statutory enforcement of minima and the scholastic persuasion for maxima, by coordinating inharmonious views and concerns among public, pedagogic, and professional interests, through counsels of moderation, expediency, and compromise in the direction of progress at a rate of speed in accord with the requirements of balance and order. Although the Council's minimum requirements cannot be ignored by the schools that seek its complete public approval, these standards are advisory in the sense that any school is free to disregard the entire program. These three agencies of external regulation collectively prevent retrogression, stimulate progress, and moderate the speed and influence the direction of advance in dental education. There are no urgent reasons for the elimination of any of these agencies, but there is abundant opportunity for improvement in their operation. The educational provisions in many statutes are no longer progressive. The American Association of Dental Schools has not yet exerted an important influence for the improvement of teaching. The Dental Educational Council should be reduced in size, given better financial support, and made a strictly judicial body.

B. REGULATION BY STATUTORY PROVISION OF MINIMUM REQUIREMENTS
FOR DENTAL SCHOOLS

a. Control of schools through the explicit prerequisite of reputability

1. *General specifications affecting reputability*

Most of the dental statutes expressly provide that none but graduates of "reputable" dental schools may be admitted to the license examinations, and many of the laws specify the individual subjects that a dental school, to be reputable, must include in its curriculum. A number of the licensing boards have authority, within reasonable limitations and in the proper exercise of their discretion, to define and publicly to indicate the kind and the scope of the pre-professional education that a reputable dental school must require for admission; and many of the boards may also prescribe the general nature and quality and some of the conditions of the professional training that a dental school, to be reputable, must afford.

2. *Authority of a state board to refuse admission of graduates of unworthy schools to license examinations*

(a) A judicial function

A board's procedure to ascertain and to determine the facts of reputability is a judicial function, since enquiry, discretion, and judgment are involved. The authority of state boards to determine the reputability of dental schools, and to act judicially thereon, has frequently been challenged, but their decisions in this respect have been uniformly approved when their judgments, attained without abuse of discretion after suitable investigation by methods fairly conducted, were predicated on reasonable evidence that was free from malice or fraud, and did not distort the meaning ordinarily attached to the term "reputability."

In an illustrative decision, in this connection (*People ex rel. Sheppard v. Illinois State Board of Dental Examiners*, 110 Ill. 180; 1884),¹ the court held that the word "reputable" in the statute expressed its ordinary meaning; and that, "when the statute provided that the applicant must be a graduate of some 'reputable dental college,' it must by the plainest and most necessary implication have submitted to the decision of the board the question of fact as to the reputability of dental schools. The action of the board is to be predicated upon the existence of the requisite facts, and as no other tribunal is authorized to investigate them, they of necessity must do so." The court also said that it was known, as a part of the current history of the times, and as an aid in arriving at the legislative intention, that colleges of different kinds, which had been created under the laws of the corresponding states and which pretended annually to give full courses of instruction in the sciences and arts they professed to teach, "were not 'reputable' because they

¹ No "Reporter citation" can be given because the "N. E." series was not begun until 1885.

graduated for money, frequently without any reference to scholarship." A diploma from such an institution afforded no evidence of ability or attainments in its holder, but was a fraud and deserved no respect; and "it was as against such diplomas the law was intended to protect the public, and therefore required that the colleges be 'reputable.'"

Another court (*Williams v. State Board of Dental Examiners*, 93 Tenn. 619; 27 S. W. 1019, 1894) declared that a state board of dental examiners could refuse an application for a license to practise dentistry on the basis solely of its opinion of the dental school that issued the applicant's diploma; and that a board's judgment that a dental college is not a reputable one cannot, in the absence of arbitrary or oppressive conduct by the board, be coerced or reversed by the courts. In a related ruling under a medical statute (*Iowa Eclectic Medical College v. Schrader et al.*, Board of Medical Examiners, 87 Ia. 659; 55 N. W. 24, 1893), the court reasoned that the state board of medical examiners had authority to declare as lacking in repute a school that it had previously accepted as reputable; and that, as this matter was within the board's discretion, its judgment could neither be reversed nor set aside by the court, even if the board acted on evidence the court would have deemed insufficient. The similarity of the medical and dental statutes implies that the court's finding, on the power of the medical board, applied with equal force to the dental board.

(b) Power to determine the reputability of a school may not be delegated

Where a state board of dental examiners is expressly empowered to determine the standing or reputability of a dental school, the board is bound to exercise that function and may not delegate its authority to any other body or organization. In a case on this particular issue (*Illinois State Board of Dental Examiners v. People ex rel. Cooper*, 123 Ill. 227; 13 N. E. 201, 1887), the petitioner had been informed by letter, for the Board of Examiners, that he could not be licensed before a decision on the acceptability of his diploma had been received from the National Association of Dental Examiners, the Board thus declining to perform the duty imposed upon it by the Illinois statute, and announcing its intention to refer the question to an association composed mainly of men who resided elsewhere than in Illinois. In the court's conclusion, it was stated, in part, that when a regular graduate of a dental college applies to the board of examiners for a license, it is their duty to determine whether the college at which the applicant graduated is reputable or not, for the law clothes them and no other body with the authority to decide this question, and they cannot delegate their discretionary power to an organization beyond the limits of the state.

(c) Admissibility of evidence as to the record made by graduates of a school in the license examinations

In order to provide mathematical criteria of the reputability of dental schools, the

National Association of Dental Examiners, in 1905, began the annual publication of the percentage of the graduates of each school who failed to pass the license examinations. For several years the data were indifferently obtained, inaccurately compiled, and unreasonably interpreted, and the ensuing inferences were vigorously protested by the National Association of Dental Faculties (page 53). From 1910 to 1923, a Joint Committee on Tabulation, representing the National Association of Dental Examiners and the National Association of Dental Faculties, annually published the results of the state board examinations. Although the accuracy of the reports of individual boards has been questioned, the annual tabulations as a whole have met the requirements of practical completeness and reliability. Since 1923 the American Association of Dental Schools has replaced the National Association of Dental Faculties in the joint effort of the organized examiners and teachers to present accurate annual reports, and the tabulations are being made with the coöperation of the Dental Educational Council. Such mathematical data, accurately computed and compiled, show clearly the general facts expressed for the examinations held, the graduates in attendance, and the schools represented; but so long as the present wide differences prevail in the scope, standards, conditions, and quality of the examinations, not to mention other variables, the collective percentage data for a school are not reliable criteria of its reputability, educational efficiency, or general worth (page 109). At present the National Association of Dental Examiners regards a school as lacking in the Association's minimum requirements of efficiency, and therefore as not in good repute, when for two years in succession 30 per cent or more of the total number of applicants among its graduates fail to pass the license examinations at their first attempts. The Dental Educational Council considers a school unacceptable when the failures are 20 per cent or above for more than two consecutive years.

3. Provision of reputability no longer an adequate minimum requirement

The statutory provision on reputability makes it possible for the dental officers of the states collectively not only to exterminate unworthy dental schools, but also, by declining to issue licenses to the graduates of such schools, to prevent the creation of new dental "diploma mills" in the future. The remaining schools that lack repute are about to disappear, and, proprietary control having lost its respectability, the future establishment of undesirable dental schools is entirely improbable. Hereafter, statutory control could be directed most effectually to the rejection of graduates of schools that are "poor" rather than positively "disreputable" (page 69).

b. Control of schools through requirements affecting the scope and conditions of their instruction of students

In approximately half of the number of states, the dental practice acts designate certain sciences and arts in which a candidate for a license, to be successful, must show pro-

iciency (page 64). In some states such specifications are absent from the laws but are included in the published rules of the examining boards, where their practical influence is the same. A state board may lawfully extend at will the scope of its examinations, in accordance with its judgment of the requirements of dental practice. When a board's discretionary powers are used to enforce general conditions rather than detailed requirements, their exercise favors development of quality in the programs of dental schools, and of competency in the dental graduates. Statutory specification of educational details is no longer needed; on the contrary, it tends to interfere with the orderly improvement of curricula. Where the dental regulations fix the number of hours for the subjects to be taught, the sequence of their presentation, and the years in the curriculum during which the subjects must be completed — all in a rigid program — desirable freedom in the evolution of dental education may be seriously impaired. Curricula cannot be suitably improved when earnest teachers are prohibited from testing effectively the value of departures from conventional views. Statutes and examining boards are often behind the times educationally; and the boards are presumably not so competent as are the faculties of the better dental schools to prescribe the details of a dental curriculum. In any state, indications by the board of the types and degrees of proficiency to be attained by a licensee, and outlines of model curricula, which would express general views on the desirable scope of dental practice and suggest approximate minimal educational requirements, would probably be sufficient guidance for all acceptable schools. Thoroughness in the license examinations would prevent abuse of such freedom, and in any event would fully protect the state.

C. ADVISORY CONTROL BY PROFESSIONAL ORGANIZATIONS

a. General organizations of practitioners

All of the leading organizations of practitioners, at their meetings and in their publications, have given consideration recurrently to various aspects of the educational needs of the dental profession. By discussion and constructive criticism of particular phases, and by action on the reports of committees, these bodies have informally encouraged conservative advancement. The most important influences on dental education, through existing general organizations of practitioners, have been exerted in this way by the National Association of Dental Examiners (page 35) and the American Dental Association (page 33), each of which is now represented in the Dental Educational Council of America by six members.

b. Special educational organizations

1. American Association of Dental Schools

The general relationships of the National Association of Dental Faculties, the American Institute of Dental Teachers, and the Dental Faculties Association of American

Universities, to the regulation of dental education, are indicated on pages 50-53, and are considered further in Chapter VII. The American Association of Dental Schools, into which these three organizations were amalgamated in 1923, continues the spirit and progressive influence of the earlier national associations of schools and teachers, and is represented in the Dental Educational Council of America by six members. At the annual meetings, this Association offers, to all of the teachers and executives, unrestricted opportunity to review current conditions, methods, and tendencies in the dental schools and in education generally, and to promote the advancement of the most desirable measures and influences in every phase of their work. Maintaining the advisory functions of the Institute and of the Dental Faculties Association of American Universities, but having none of the mandatory powers of the National Association of Dental Faculties, the new Association embodies the combined strength of the three, and, with the cooperation of the Canadian schools, presents all of the conditions that are most favorable for the development and encouragement of leadership and progress in dental education in North America.

2. *Dental Educational Council of America*

(a) Period before the first public classification of dental schools (1909-18)

(1) *Conditions preceding the announcement, in 1916, of the original minimum requirements for a Class A rating*

The origin, general nature, and chief concern of the Dental Educational Council of America are indicated in Chapter II (page 53). The Council was organized to develop accord between the state boards of dental examiners and the dental faculties, for the protection of respectable dental schools, after a series of disagreements resulting from the attitude of some of the more earnest boards against commercialism in dental education. But the avowed purpose of accommodation, in the creation of the Council, was regarded with distrust by some of the state boards, with suspicion by many of the commercial schools, and with misgiving by a number of the better university schools. These conditions were also clouded by personal misunderstandings and by partisan feuds, and, as financial support was inadequate and apathy to dental education prevailed, the Council was unable to function effectually until about 1916.

The Council was organized in the year when the National Association of Dental Faculties raised the entrance requirement, for the schools represented in it, to graduation from an accredited high school, or the equivalent as determined by examination. In 1910, when this rule went into effect, ten of the fifty-four schools in this country had failed to join either of the two existing associations of dental faculties; and by 1916 the number of unassociated schools had increased to twelve in a total of fifty. These schools were disinclined to submit to the collective judgments of the members of an association of dental faculties, but some of them were not regarded as sufficiently desirable for membership in either body.

During this period, although graduation from an accredited high school "or its equivalent" was universally proclaimed as a prerequisite for admission, a large number of schools took unscrupulous advantage of the import of the alternative, and, admitting unqualified applicants, not only weakened the foundation of dental education by inducing prospective dental students to anticipate evasion of the stated requirement and to refrain from preparing to enter the better schools, but also invited into their schools persons of unethical bent, encouraged dishonesty among their students, and favored increase in the number of disreputable practitioners. Some of the commercial schools that were willing to enforce the entrance requirement refused to do so against such competition. In many schools admissions to advanced standing also were freely granted to deficient students on a frankly commercial basis. Teachers in the better institutions, apprehensive about the consequences of these irregularities, feared that even the most earnest and alert of the state boards would fail to distinguish the honest from the dishonest schools. There was growing concern, also, regarding the prevailing lack of information as to the spirit, administration, equipment, and teaching of most of the unassociated schools, and an increasing desire for the judicial intervention of such a body as the Council.

In May, 1916, in a paper read before the Massachusetts Dental Society and published a month later in the *Journal of the Allied Dental Societies* (pp. 222-237), a member of the Council, writing avowedly from intimate knowledge of the Council's study of dental education during the preceding two years, classified the fifty dental schools then existing in the United States into these groups:

Privately owned	21	
Affiliated with or owned by medical schools	3	
Affiliated with universities	3	
Organic parts of sectarian institutions	11	
Organic parts of "standard" universities	<u>12</u>	50

Of the schools collectively, it was said that the Council's study indicated that some were owned by individuals and some by stockholders; others were nominally affiliated with "colleges (so-called universities)" or universities, or had "working relationships and degree-conferring contracts with universities," or were integral parts of universities; but, in some instances, the university relationships were "simply a pretense or wholly undesirable." At one extreme some of the schools enforced no definite academic entrance requirements; at the other, graduation from an accredited high school for admission was strictly exacted; and between the two extremes stood "all varieties of published requirements, and private observance or evasion."

In the summer of 1916, after all of the dental schools had been visited by representatives of the Council during the two preceding years, and it had been found in their conservative judgment that some of the schools were greatly overcrowded, or lacked efficient management, or were financially unable to give satisfactory instruction, the Council

issued its first statement of the "minimum requirements for a Class A dental school," and announced that, after another general inspection in 1917-18, a preliminary classification of the schools would be published in 1918. Meanwhile, pursuant to independent action by each of the two national associations of dental faculties, the dental curriculum, which had been three years in length, was extended to four years in all of the schools, beginning in 1917-18.

(2) *Original minimum requirements for a Class A rating (1916)*

The minimum requirements for the Council's Class A rating, as announced in 1916 with minor revisions in 1917 and 1918, and as enforced in 1918, were conservative and in some respects unavoidably primitive, but they registered the conditions then prevailing in the better schools. The academic requirement for admission was "fifteen units of high-school work beyond the grade of the elementary schools, or its equivalent." Beginning in 1917-18 the dental curriculum extended through four years of thirty-two weeks of six days each, instead of three such years, and a total of at least 4400 hours of instruction was prescribed for the four years. Twenty-one required subjects were listed, with a specification of the minimum number of hours of instruction for each, but without any suggestion of the order or year of their presentation, although it was required that "dental subjects" be taught throughout the four years; and it was stated that schools that offered a three-year curriculum, with one year of work in an academic college as a prerequisite, would not meet the requirements. The only direct financial allusion was the provision that the value of the buildings and equipment, excluding grounds, "must be equal to at least \$300 for every student enrolled"; there was no specification of a minimum annual income in excess of receipts in fees from students and patients. The library was required to have at least twice as many volumes as the number of enrolled students, but the kinds of volumes were not suggested. Except in a few routine specifications, such as a small minimum proportion of teachers to students in the laboratory courses in the medical sciences, teaching was ignored. It was indicated that a Class A rating could not be retained or awarded to a school, in a given year, if more than 25 per cent of the number of its graduates taking license examinations failed to pass in the two years next preceding. There were no suggestions of grades B and C in the prospective classification of 1918.

(3) *Opposition from the Dental Faculties Association of American Universities*

Throughout the period from 1909 to 1917, the Council was subjected to outspoken criticism and to vigorous opposition from the Dental Faculties Association of American Universities, which, by January, 1918, included the dental schools at California, Harvard, Illinois, Iowa, Michigan, Minnesota, Ohio State, Pennsylvania, and Washington. The Association's objections were based on the grounds chiefly that the Council, containing some influential beneficiaries of commercialism in dentistry or sympathizers with it,

did not respect essential needs of dental education; was incompetent to exercise advisory regulation or police power over schools that were integral parts of universities; rendered decisions that often reflected personal political accommodations; and afforded protection to schools that were proprietary or mercenary, with all that these conditions implied of disadvantage to dental education. The Council, in turn, pointed to the facts that some of the schools in the Association were poorly supported, generally neglected, or conducted in a mercenary manner by the universities of which they were members, and that a university relationship did not automatically impart high educational quality to a dental school. The Association disregarded the circumstance that the Council's endeavors to improve dental education were gravely handicapped by the prevailing separation of the schools into two opposing groups.

The position of the Dental Faculties Association of American Universities, in its advocacy of more advanced educational conditions, its objection to commercialism in dental schools, and its opposition to the Council, gradually grew stronger as its membership increased and as that of the National Association of Dental Faculties decreased. In Table I, the figures show that, after the organization of the Dental Faculties Association of American Universities in 1908 and of the Council in 1909, there was a gradual decrease in the total number of dental schools, of the members of the National Association of Dental Faculties, and of the unassociated schools, but an increase in the number of members of the Dental Faculties Association of American Universities. The proportion of the total

TABLE I
CLASSIFICATION OF THE DENTAL SCHOOLS IN THE UNITED STATES ACCORDING TO THEIR MEMBERSHIPS IN THE TWO ASSOCIATIONS OF DENTAL FACULTIES: 1908-25¹

Year	Total number of schools	Members of the National Association of Dental Faculties	Members of the Dental Faculties Association of American Universities	Members of neither association of faculties ("unassociated") ²	Not members of the National Association of Dental Faculties
1908	56	41	6	9	15
1913	53	34	6	13	19
1914	50	34	7	9	16
1917	49	30	7	12	19
1918 ³	49	30	9	10	19
1919	48	30	10	8	18
1920	48	28	11	9	20
1921	46	30	11	5	16
1922	46	28	13 ³	5	18
1923	46	27 ⁴	13 ³	6	19
1924	43	All but three were members of the American Association of Dental Schools, which is represented in the Council			
1925 ⁵	43				

¹ Practically all were members of the American Institute of Dental Teachers.

² The Council's original classification of the schools was published in 1918.

³ Represented in the Dental Educational Council of America.

⁴ One of these was united, on July 1, 1923, with a member of the Dental Faculties Association of American Universities.

⁵ The Dental School of the University of Rochester was ready to receive students in 1925-26, but none qualified for admission; and it is not included in the number for 1925.

number of schools that were not guided by the National Association of Dental Faculties, and not represented in the Council, before 1922, rose from 26.8 per cent in 1908 to 39.1 per cent in 1922.

(b) First public classification of dental schools (1918)

In 1917, the military needs of the country and the purpose of the Council to proceed with the classification of the dental schools having become coincident, active opposition to the work of the Council was suspended. This was indicated formally, on January 29, 1918, by a unanimous vote of the representatives of nearly all of the schools at the annual meeting of the American Institute of Dental Teachers, on the following resolution, as recorded on page 5 of the *Proceedings*: "In compliance with the request of the Surgeon-General of the Army that this body should furnish information as a basis for classification of the dental schools of the United States, be it resolved that the American Institute of Dental Teachers, composed of the faculties of practically all of the dental schools of the United States, recommend to the Surgeon-General of the Army that the report to be submitted by the Dental Educational Council of America be accepted for this purpose."¹

In conformity with the Surgeon-General's ensuing request for the Council's classification of the dental schools, on which to base further official action in the plans for the conduct of the war, the Council, at a special session in New York, in March, 1918, tentatively divided the schools into classes A, B, and C. This provisional classification was promptly communicated to the Surgeon-General, but was not published before its revision at an annual meeting of the Council, in Chicago, four months later. At that meeting, in revising its minimum requirements for a Class A rating, the Council voted that "the conduction of a dental school for profit to individuals or a corporation does not meet the standard of fair ideals, as interpreted by the Dental Educational Council of America," but at the same session inconsistently gave a Class A rating to a proprietary school.

Of the forty-nine dental schools in the United States in 1918, the Council rated sixteen Class A, twenty-seven Class B, and four Class C. Two were not officially mentioned. In the judgment of the Council, Class B schools were those which, though failing to meet the previously published minimum requirements for a Class A rating, could do so by making important improvements; Class C schools were those that could not be made acceptable without complete reorganization.

(c) Classifications of dental schools since 1918

The initial classification of dental schools, in 1918, marked the beginning of a new epoch in dental education, but it also excited vigorous criticism of the Council, not only

¹ In the fall of 1917, in order promptly to facilitate the enrolment of dental students in the Enlisted Reserve Corps of the Medical Department of the Army and in conformity with new legislation by Congress, the Surgeon-General used tentatively a list of dental schools approved as "well recognized" by the National Association of Dental Examiners.

from disappointed inferior schools that desired the stamp of high grade, but also from most of the best schools because a Class A rating had been given to a proprietary school and to a number of university schools that were poorly supported and low in educational quality. One of the effects or accompaniments of this criticism of the Council was a further increase in the influence of the Dental Faculties Association of American Universities, which, in the nearsightedness of its growing partisanship, readily accepted into membership a newly founded university school that had been created from a low grade proprietary school, the dean of which was its former owner and a financial beneficiary of its continuance. From the close of the World War until 1922, the Dental Faculties Association of American Universities rejected all suggestions, including one from a representative of the Surgeon-General's Office, that it be consolidated with the National Association of Dental Faculties. Despite the efforts of individuals, and of the associations of faculties and of the Council, to bring about an understanding that would permit representatives of the Dental Faculties Association of American Universities to be seated in the Council, such accord could not be attained during this period because of lack of respect for the Council.

The schools were publicly reclassified by the Council in 1920, 1921, 1923, 1924, and 1925, following further revisions, in 1918, 1920, and 1922, of the published minimum requirements for the Class A rating. In 1920, of the forty-eight dental schools in the United States nineteen were rated Class A; twenty-four, Class B; and four, Class C. One was not officially mentioned. In 1921, the only change in rating was the promotion

TABLE 2
DATA PERTAINING TO THE DENTAL EDUCATIONAL COUNCIL'S RATING OF THE PROPRIETARY DENTAL SCHOOLS: 1918-25

Year of classification	Council's published definition of the grade of C for a dental school ¹	Number of proprietary schools in the four groups				
		Classes			Unclassified	Total
		A	B	C		
1918	Unable to meet Class A requirements without very extensive improvement and complete reorganization ¹	1	10	5	..	16
1920	Unable to meet Class A or Class B requirements without extensive improvement and complete reorganization; or conducted for profit to individuals or to a corporation ¹	1	7	2	..	10
1921	The same definition ¹	2	6	2	..	10
1923	The same definition ¹	1	1	2	1	5
1924	The same definition ¹	0	1	2	1	4
1925	The same definition ¹	0	1	2	0	3

¹ In 1918, at the meeting at which the first public classification of the schools was authorized, the Council added the following item to its published minimum requirements for a Class A rating: "The conduction of a dental school for profit to individuals or a corporation does not meet the standard of fair ideals, as interpreted by the Dental Educational Council of America." In 1920 this item was superseded by the following, which has since been an announced standing "minimum requirement": "A dental school organized and conducted for profit either to individuals or to a corporation, whether in the form of unduly large salaries or rentals or of profit for direct distribution, does not meet the standard of fair ideals, as interpreted by the Dental Educational Council of America."

of another proprietary school to the grade of Class A, in direct violation of the Council's own regulations. Among the immediate effects of the Council's weakness in this instance was further loss of confidence in its capacity and sincerity, and greater impetus to the growth of the association of dental faculties that refused to cooperate with it. Almost immediately afterward, however, when it became apparent that the Dental Faculties Association of American Universities was clearly gaining leadership from the immediate strength and potential public importance of its educational position, but that seriously wasteful conflicts would be inevitable unless the Council and the Association were brought into cooperation, a crisis in the affairs of both organizations was met by each in a constructive spirit. Three delegates from the Dental Faculties Association of American Universities were seated in the Council in January, 1922, and remained until September, 1923, when the Association was amalgamated with other national bodies into the American Association of Dental Schools. Since 1922 the Council has received general support, and its work in the main, under the ensuing favorable conditions of cooperation, has shown cumulative effectiveness and importance.

The earlier educational weakness of the Council and the recent growth in its strength have been shown most strikingly by the successive degrees of sincerity with which, in its classifications, it has respected its own public definition of the grade of C for a dental school. The significant facts may be seen at a glance in Table 2, on page 107, where it will be noted that eight commercial schools were given Class A or Class B ratings in 1920 and 1921, despite the Council's public announcements that such schools were unacceptable and C in grade, but that only two proprietary schools received a higher rating than grade C in 1923, and but one in 1924 and in 1925.

The general numerical results of the Council's classifications of the schools are shown in Table 3.

TABLE 3
DATA RELATING TO THE OFFICIAL CLASSIFICATIONS OF THE DENTAL SCHOOLS IN THE
UNITED STATES: 1918-25

Year	Schools	Class A	Class B	Class C	Unclassified
1918	49	16	27	4	2
1920	48	19	24	4	1
1921	46	20	22	3	1
1923 (July)	43	20	15	2	6
1923 (Sept.)	43	21	16	2	4
1924	43	23	14	2	4
1925	43	24	14	2	3

(d) Special features of the Council's rating procedure

(1) "Point" system of rating schools

Until 1922, the Council's ratings of the schools, conducted by a method lacking stability and uniformity, consisted chiefly of discussions on reports by committees of inspection,

with a motion and vote to adopt a particular grade in a given instance. In 1922 the Council began the use of a "point" system of rating the schools, by which each school's standing has since been evaluated in terms of specific criteria definitely weighted numerically. By this improved method the discernible qualifications of a school may be accurately recorded on a uniform basis by a visiting committee, discussed directly by such a committee during its visit to the school and at meetings of the Council, and logically evaluated by the members of the Council on the report of the committee, as perfectly as the soundness of the standards, the correctness and completeness of the available information, and the ability and sincerity of the members permit. The form of the report that the Council has been using, to indicate to a school the details of a rating in terms of the current criteria, was published in the concluding volume of the *Proceedings of the National Association of Dental Faculties* (1923, xl, pp. 43-47).

(2) *Lack of value, for rating purposes, of the percentages of a school's graduates who fail to pass license examinations*

The Council's groupings of the dental schools in grades A, B, and C are based on distinctions which, in the Council's belief, signify material differences in degrees of teaching efficiency and imply, for example, that the graduates of Class A schools are more competent than the graduates of Class B schools to pass a given state board examination. If the Council's ratings of the schools are uniformly correct, then the illustrative figures in Table 4 for the percentages of collective failures in license examinations of graduates of some Class A schools, compared with those of a number of Class B schools, show a striking degree of inequality and unreliability of the license examinations as tests of competency to practise dentistry, and also demonstrate that the data for percentages of such failures do not afford a reliable index of the quality of a school's instruction. On the other hand, if the collective percentage results of the license examinations are strictly

TABLE 4
PERCENTAGES OF COLLECTIVE FAILURES OF GRADUATES OF CERTAIN DENTAL SCHOOLS IN RECENT LICENSE EXAMINATIONS: 1921-25

	Class A schools						Class B schools				
	1925	1924	1923	1922	1921		1925	1924	1923	1922	1921
Buffalo	4.2	15.1	24.6	5.5	10.9	Atlanta-Southern ¹	4.7	1.2	0.9	0.0	5.0
Creighton	4.3	7.1	14.0	12.5	12.5	Indiana ¹	6.4	13.8	0.0	4.1	7.1
Harvard	20.8	15.1	5.8	3.1	0.0	Kansas City-Western ²	2.2	3.0	2.7	1.8	4.5
North Pacific ³	37.1	33.1	10.1	9.4	10.0	Loyola (New Orleans)	0.0	9.1	0.0	0.0	0.0
Pennsylvania	13.0	17.2	17.4	22.0	11.2	Temple	7.4	9.7	4.6	7.4	10.0
Tufts	19.4	16.9	5.4	13.5	1.9	Virginia ⁴	11.1	0.0	0.0	0.0	0.0

¹Independent and proprietary throughout the five-year period.
²Independent and proprietary during 1921 and 1922; independent but non-proprietary since 1923.
³Independent and proprietary during 1921-23; independent but non-proprietary since 1924. Rated Class B on July 1, 1923; restored to Class A in March, 1924.
⁴Rated Class A during 1921 and 1922; Class B, 1923 and 1924; Class A, 1925.

comparable, many of the ratings accorded by the Council cannot be accurate. The excellent record of the proprietary schools in the Class B group, in the Table, cannot be attributed to demonstrated educational superiority, but it is not so impressive as that of the two Class C schools, each of which had a perfect record for 1923 and 1924, all of their graduates having passed license examinations at the first attempt.

At present the license examinations are so completely lacking in equivalence among the state boards, that the percentage data for the collective failures of a school's graduates to pass the examinations are not only unreliable as indices of educational quality but may lead to serious misjudgment of a school's efficiency (page 100). The examinations are widely unequal in a given year, and from year to year, in scope and quality, in the standards of evaluation of the responses of the candidates, and in the educational knowledge and judgment as well as professional insight of the examiners (page 66). The percentage values do not reveal the comparative effects of the wide variations in either the annual number of graduates of the schools concerned or the total number of states in which each school's graduates are examined. The collective percentage data are further deprived of comparative value by the fact that the selection of members of some state boards is not entirely free from the influence of particular schools desirous of obtaining special consideration for their graduates. Furthermore, some of the schools, aiming to be very practical, make the prospective license examinations the avowed main objective toward which all of the courses are directed and on which the minds of the students are centred, and give special "state-board quizzes," formally or informally, to concentrate on this purpose. Despite the narrowness and superficiality of the professional training thus afforded, the graduates may do particularly well in a license examination, especially when they appear before a board whose questions have been effectually anticipated and whose members exhibit partiality for the school that the candidates represent. The use of such "excellent state-board records" to obtain new students, on the ground that superiority of training and assurance of admission to practice are indicated by them, cannot be fair either to the students themselves or to the schools that aim to teach the science and the art of dentistry rather than the knack of passing license examinations.

(3) Publication of classification standards

Since 1916 the Council has published a series of folders and pamphlets presenting its "minimum requirements for Class A dental schools." These requirements, revised frequently, have brought about important improvements in most of the schools, which have been in need of the help the Council's suggestions afforded. The bearing of these publications on the dental curriculum is considered in Chapter VII. As a rule, the Council's requirements at a particular time, in accord with its liberal-conservative position, have been less advanced than the corresponding conditions in the better schools. Thus, in 1921-22,

all but one of the schools in the Dental Faculties Association of American Universities required, and twenty-eight of the forty-four schools in the United States now exact (1925-26), at least one year of work in an academic college for admission, but the Council will not include that prerequisite among its minimum requirements for a Class A or Class B rating before 1926-27.

(e) Suggested improvements in the status and work of the Council

(1) *Prospective betterment of its relationships*

Commercialism in dental education caused the important disagreements that the Council was established to ameliorate, and the influence of strong proprietary schools on the Council's decisions before 1922 impelled an increasing number of dental schools in leading universities to decline to cooperate with it. Since 1922, however, the Council, supported by all of the better schools, has been attaining its original objectives and also effectually urging the union of independent dental colleges with universities. As a consequence, commercialism in dental education is no longer acceptable, and the proprietary dental school is about to become extinct. The indicated and implied objects of the Council's creation having been practically accomplished, dental education having become a function of the university, and the discordant national organizations of dental schools and teachers having been amalgamated into a strong educational association, a number of important questions pertaining to improvement of the status and functions of the Council, or to the desirability of its discontinuance, have recently been receiving special attention.

There are those who feel that the Council's further opportunities for public service are not important enough to justify its continuance, and that the universities, which hereafter will conduct dental education, are not in need of advice that their faculties cannot give or which the American Association of Dental Schools cannot offer. This view overlooks the fact that some responsible universities have been conducting their dental schools in a mercenary spirit or giving them very indifferent attention. It disregards the possibility that, in the absence of disinterested supervision from such a public body as the Council, these universities would continue indefinitely to neglect their dental schools. It ignores the circumstance that direct or active censorship of one another cannot suitably be included among the functions of the schools, individually or as members of the American Association of Dental Schools. Furthermore, the urgent need for closer educational accord between medical and dental schools will soon require special attention from such supervisory bodies as the Councils on Medical and Dental Education, which, in this particular connection, will probably find it desirable to cooperate.

There are others who urge that, since 1922, the Council has been too strongly influenced progressively by the spirit of leading university schools and that, before it is too late, the Council should be brought under the immediate control of those who direct the

political affairs of the organized dental practitioners, some of them past beneficiaries of commercialism in dental education, so that the wings of the Council's educational sincerity may be effectually clipped from time to time and the Council "kept within proper bounds." At the present stage in the evolution of dental education, the degradation of the Council from the status of a commission of representatives of the three national associations of examiners, teachers, and practitioners, to a committee of the national association of practitioners, would accomplish what some inferior dental schools now desire: it would weaken the Council's usefulness by destroying its independence, impairing its initiative, and limiting its freedom of responsible expression of opinion. There is nothing in the practice of dentistry that needs protection against the influence of the best schools of dentistry; and there are no longer any legitimate interests in dental education except those of the public that require defense by a national association of practitioners. Dental education should be continually improved in accordance with the expanding needs of oral health-service, as determined primarily from the point of view of public welfare by those collectively most competent to do so, and not from any fixed consideration of influential selfishness or any temporary vantage of professional partisanship. In some quarters there is a disposition to forget that dentistry is neither a political party nor a secret society; that it is not an organization of dentists by dentists for dentists; but that it is an accredited agency for public service, open to public inspection, subject to public regulation, and subservient to public opinion.

If the Council were continued and properly supported as an independent judicial commission of representatives of national dental and educational organizations, it could give the universities helpful guidance, the state boards useful assistance, and the public effectual service. But the Council's future usefulness will depend, with increasing assurance, upon the disposition and ability of the dental profession to make it a strictly judicial body, and to raise it above the suspicion of adaptability to unworthy concerns among the examiners, practitioners, or teachers. It could not function to the highest degree of public utility, if, constituted a committee of the association of practitioners as at present animated, its decisions were subject, at annual meetings under the stress of partisan manoeuvres or political excitement, to modification, substitution, or rejection by a majority vote of less well-informed members. If the problems of dental education should be solved by a majority vote at meetings of any general organization, it would be reasonable to expect such decisions to rest with the national association of state boards of examiners or of dental schools, for either of these, charged with special educational responsibilities, would presumably comprehend and respect the public needs in this relation. This view harmonizes with the circumstance that when, in a national emergency in 1917, the Surgeon-General of the Army desired to confer with the most representative body in dental education in the United States, his request for guidance in making this selection was addressed to the American Institute of Dental Teachers, which, by unanimous vote, designated the

Council (page 106). As is now widely known, the Surgeon-General regarded the Council as the responsible consultant in dental education during the war because of the fact, among several, that a portion of its membership represented the associated state boards of dental examiners, the legally constituted educational authorities in dentistry. The Council on Medical Education and Hospitals of the American Medical Association was not accorded the same status by the Surgeon-General because it did not contain a representation of the state boards of medical examiners.

The only necessary restraint, on such a judicial and advisory body as the Council, is that of earnest selection of members who are notable for ability, independence, courage, disinterestedness, and trustworthiness. Their mistakes would hardly be more numerous or damaging than those of majorities at annual meetings of a national association of practitioners; and it would be far better for the dental profession to submit to the embarrassments from occasional errors of judgment of a Council of highly reputable representatives, with public criticism as an effectual corrective, than to lose the many advantages that would accrue from unfettered expressions of the convictions of such a body.

(2) *Proposed reorganization and enlargement of its responsibilities*

The Council, with its present membership of eighteen, is much larger than the amount and character of its work and the nature of its functions require. Its usefulness would not be impaired if its total membership were diminished to seven or nine, if each of the three constituent groups were reduced to two or three delegates, and if there were added, as active or advisory members, several representatives of such educational organizations as the Association of American Universities and the Association of American Medical Colleges. The deliberations of the Council need more judgment and less geography. The suggested decrease would focus attention on the selection of the fittest representatives of each of the organizations concerned, and would greatly reduce the amount required at present to pay the traveling expenses of the members. It would also improve the opportunities for close attention to the business of the meetings, increase the sense of responsibility of the individual members, and reduce the Council to the size of the executive circle by which, whether formally appointed or spontaneously segregated, a group as large as the present Council is apt to be guided or controlled. The addition of representatives of bodies like the Associations of American Universities and American Medical Colleges would bring such important national organizations into effective affiliation with the leadership in dental education, and would give the Council's deliberations and conclusions an improved quality and a higher public authority. At present (December, 1925), of the eighteen members of the Council seven are deans of dental schools, and one is a stockholder in a proprietary school. It is doubtful whether the functions of the Council can always be performed judicially by a body consisting so largely of men who are obliged continually to encounter the temptations of direct self-interest. They would be more than

human if, as judges, they could completely disregard their loyalty to the schools of which they are officers.

If the Council had financial support sufficient to enable it, with the aid of a whole-time executive officer, to attend continuously to constructive work in behalf of all of the dental schools and state boards, and of the dental profession and of the lay public, its office might be maintained conveniently with that of the National Association of Dental Examiners, in quarters provided by or for both, and for a national board of dental examiners. Some of the funds now being wasted on the traveling expenses of oversized political representations in the Council could be used advantageously for this purpose.

The Council should conduct thorough studies of the quality and procedures of the state boards of dental examiners, and occasionally publish reports on the work of the boards in terms of their grades of efficiency, in order to promote the selection of the most competent dentists to membership in the boards, to increase the usefulness of the examiners, to impart approximate uniformity to the quality and sufficiency of the license examinations, and to facilitate the work of a prospective supplementary national board of examiners in dentistry.

The Council might appropriately take entire charge of the annual compilation, verification, and publication of the collective results of the license examinations, as soon as such data proved to be comparable. In the presentation of such information, it would be a decided improvement if the results were given for each school in every state. A comparison could then profitably be instituted between the local and the extra-state records of any given school in the license examinations. The reports, as published heretofore, do not thus classify the data.

CHAPTER VII

CURRICULUM AND TEACHING OF DENTISTRY

A. OUTLINE OF THE DEVELOPMENT OF THE CURRICULUM

a. Early influences

WHEN dentistry knocked at the door of medicine and, seeking fellowship, was turned away, the leadership that founded the earlier dental schools, aiming to raise dental practice from the status of a mechanical trade to that of a healing art, endeavored to give it the quality of a branch of surgery. For the attainment of this object, the procedures of the medical schools were closely followed; medical sciences were made the basic subjects in the dental curriculum, although all of the courses were directed sharply to the particular needs of dentistry; and the degree of Doctor of Dental Surgery was awarded as the distinctive mark of proficiency in the practice of the art. The formal title of all but one of the dental schools that were established before 1863 contained the designation: "college of dental surgery." From 1840, when the first dental school was founded, to 1884, when the first association of dental schools was organized, the curriculum in each school was developed more or less independently, and in its details represented local or individual views; but, owing to the common purpose to make dentistry a branch of surgery, and to give it the foundations of medicine, the main features of the various dental curricula were similar. In accordance with the titles of the four professorships in the original dental faculty, which were held by doctors of medicine, two of whom were primarily dentists, the first dental curriculum, which long served as a guide for dental schools, was much like the medical curricula of that period. It consisted of anatomy, pathology, physiology, therapeutics, and their dental aspects, as well as clinical dentistry and the related principles of surgery, with little or no reference to clinical medicine, all of which, with the exception of anatomy, were taught solely through the agency of lectures and demonstrations. As late as 1867, when the first permanent university dental school was founded in close coördination with a medical school, and state regulation of dental practice was about to be effectually inaugurated, the dental curriculum continued to develop broadly on a medical foundation, and included anatomy, chemistry, histology, materia medica and therapeutics, mechanical dentistry, operative dentistry, pathology, physiology, and surgery. But, by this time, less attention was given to anatomical dissection, the earlier clinical dentistry had been divided into mechanical dentistry and operative dentistry, and the reconstructive aspects of dental practice were acquiring increased importance, as the mechanical improvements of superficial dentistry multiplied and the popularity of artistic dental restorations grew.

The earlier dental colleges, following the example of medical schools, gave their

instruction almost entirely in lectures and demonstrations, and required the students to obtain practical training privately from practitioners, apprenticeship remaining an informal adjunct. The inherent defect of this supplementary work was its irresponsibility, both in quality and in quantity, especially for the weaker students. For years, however, this subsidiary requirement was usually given only nominal enforcement. In 1867 a concerted effort was made to improve the coördination between the institutional instruction and the preceptorial teaching. In March of that year a conference of five of the six existing dental schools (page 117, footnote 1), after agreeing to "establish and maintain uniformity of action on the part of all the institutions relative to the length of pupilage which should be demanded of dental students, the requirements of candidates for graduation, etc.," included the following regulations among those adopted: (a) "That two full years of pupilage with a reputable dental practitioner, inclusive of two complete courses of lectures in a dental college, be required to entitle the candidate to an examination for graduation with the degree of D.D.S."; and (b) "that a candidate for graduation be *required to furnish a written certificate of having fulfilled the required pupilage. . . .*" (Italic not in the original.) In the following November, the School at Harvard began its first year on what was then the highest plane—successful completion of a curriculum extending through two years of four months each and of "three years of apprenticeship in an office" (page 41). One of the chief merits of the original Harvard plan, which influenced the better schools, was the sincerity in its enforcement of the supplementary work with a preceptor, not only as to the length of the apprenticeship, but also the ensuing proficiency.

Before 1885, the dental curriculum extended through two terms ranging in length from three to five months—usually about sixteen weeks of teaching time—according to the preferences of the individual schools, and often in the same calendar year. In harmony with medical custom, the lecture courses, each of which was given to the entire student body, were not graded but repetitive. Therefore, much of the time of a senior was devoted to a review of what he had been taught as a junior. The practical work in the school was chiefly such as could be done in anatomy, dental mechanics, and operative dentistry. In further accord with conditions in medical education, there were marked dissimilarities among the dental schools in minimum requirements for admission, in the scope and efficiency of the teaching, and in the general scholastic standards, and boys were permitted to become practitioners at sixteen or seventeen. During this era, it was customary among the dental schools to admit directly into the senior class all applicants who had received the M.D. degree, or had practised dentistry for at least five years. In many instances apprenticed dental practitioners were admitted to the schools as late as the middle of the senior year, and, in three months or less, were graduated and given the degree of D.D.S., which was often bestowed, also, as an honorary award, although under

conditions that frequently were discreditable.¹ The National Association of Dental Faculties, immediately after its formal organization in 1884, planning to abolish undesirable customs and to raise academic standards, voted to require all candidates for the degree of D.D.S., beginning with the academic year 1885-86, to attend two full regular terms of not less than five months each in separate calendar years, thus bringing to an end the formal recognition of apprenticeship as an equivalent of a portion of the work required for the D.D.S. degree.

During the past forty years, under the guidance of the national organizations of teachers, examiners, and practitioners, and of the Dental Educational Council of America, the minimum academic requirement for admission to dental schools has been raised from "the possession of the rudiments of an English education," which often meant little more than intelligence enough to arrange for the payment of the entrance fee, to graduation from an accredited four-year high school, or the equivalent; the academic year has been lengthened from five months of uncertain teaching duration to thirty-two weeks of six days each; and the curriculum has been increased from one year (repeated) to four years, and its scope greatly extended (page 55).

b. Important model curricula since 1884

The National Association of Dental Faculties,² during its first year, aiming to correct important deficiencies, required the courses to be graded and the students to be examined as to their proficiency, and recommended but did not require adoption of this curriculum, which, in general content, was practically the same as that at Harvard in 1867:

First year. Anatomy, with dissections; chemistry, didactic and practical; histology, mechanical dentistry, and physiology.

¹At a conference in Philadelphia, on October 17, 1866, representatives of the dental schools in Baltimore (1), Cincinnati (1), New York (1), and Philadelphia (2)—five of the six existing schools—organized the "Association of the [American] Dental Colleges." But this first endeavor to maintain a national association of dental schools came to an end at the second meeting, on March 20, 1867, when, after a heated disagreement regarding the propriety of honorary awards of the D.D.S. degree to any persons who had not "distinguished themselves as contributors to dental science," the Pennsylvania College of Dental Surgery withdrew from the Association protesting against "a rebuke upon their past practice of conferring degrees upon practitioners of dentistry and also a restriction upon their intended future course in this respect." (*Dental Cosmos*, 1867, viii, pp. 258, 540, 656.) For years the award of the D.D.S. degree to influential though often mediocre practitioners continued to be a disturbing influence. The National Association of Dental Faculties, at its annual meeting in 1887, expressed the general opinion that the award of honorary degrees should be "discouraged," but in 1889, seeking to prevent such awards thereafter, adopted the following resolution: "Whereas, the conferring of [the] degree of Doctor of Dental Surgery 'honorarily' is contrary to the spirit of the rules and regulations of this Association; therefore, be it *Resolved*, that the degree of Doctor of Dental Surgery shall not be conferred by any college belonging to this Association, honorarily, except by consent of this Association."

In 1892 the Baltimore College of Dental Surgery was censured for violating this regulation. In 1893 the Association voted unanimously to reject an application for membership, by the Dental Department of the Homeopathic Hospital College (Cleveland), because an honorary award of the D.D.S. degree had been made by that college in 1892. In 1895 the Association protested against an honorary award of the D.D.S. degree by the Trustees of the University of Pennsylvania, which had occurred without the knowledge of the Faculty of the School of Dentistry. The cumulative influence of these actions finally stopped the practice, without preventing a few *bona fide* honorary awards to dentists of distinction.

²The National Association of Dental Faculties was organized, in 1884, by representatives of these schools: Baltimore College of Dental Surgery, Boston Dental College, Chicago College of Dental Surgery, State University of Iowa, University of Michigan, New York College of Dentistry, Ohio College of Dental Surgery, Pennsylvania College of Dental Surgery, University of Pennsylvania, Philadelphia Dental College (pages 42 and 46).

Second year. Review of junior-year studies; materia medica and therapeutics, operative dentistry, pathology, and surgery. (Neither the length of the courses nor the hours of instruction per week were specified, and the curriculum continued to be repetitive in part.)

In 1891, when the "rudiments of an English education" were sufficient to admit an applicant and the academic year was five months long, the National Association of Dental Faculties, responding to the demand for more attention to dental mechanics, and following a notable advance in medicine a year earlier, lengthened the dental curriculum to three such years, without raising the requirements for admission. In 1890, anticipating financial as well as scholastic difficulties from the lengthening of the curriculum, a majority of the schools, in their desire to retain complete freedom of action in this relation, rejected a committee's recommendation of the following three-year curriculum, which served informally, nevertheless, as a general guide during an important transition period:

First year. Anatomy, chemistry, physiology, and prosthetic technique; and practical prosthetic dentistry for the second half of the term.

Second year. Anatomy, chemistry, physiology, and prosthetic dentistry, continued; general pathology, histology, materia medica and therapeutics, and operative dentistry.

Third year. Dental materia medica and therapeutics, dental pathology, operative dentistry, oral surgery, and prosthetic dentistry.

This curriculum divided the earlier mechanical dentistry into prosthetic technique and prosthetic dentistry, gave these mechanical aspects of dentistry a larger share of attention, substituted oral surgery for general surgery, and devoted the third year mainly to clinical dentistry.

By 1899, six years after the organization of the National School of [Association for] Dental Technics, the minimum requirement for admission had been raised to the completion of one year of study in a high school, and the academic year had been lengthened to seven months, although most medical schools then required graduation from a high school. In that year the growing tendency to elaborate the mechanical aspects of dentistry, without material change in the depth or extent of the medical basis, was emphasized when the National Association of Dental Faculties approved, although it did not require the schools to adopt, the curriculum outlined in Table 1, which amplified the technical and clinical aspects of dentistry without enlarging its scientific or medical foundations beyond the introduction of lectures in bacteriology. The data in Table 2 indicate the general divisions of the teaching time specified in Table 1.

Although there were numerous changes in details, the curriculum outlined in Table 1 served as a general model until 1916. Then, the minimum entrance requirement having been raised to graduation from a high school (1910), the academic year lengthened to thirty-two weeks (1909), and the dental curriculum extended to four years (beginning in 1917-18), the Dental Educational Council included among its standards for a Class A

TABLE 1

CURRICULUM APPROVED BY THE NATIONAL ASSOCIATION OF DENTAL FACULTIES, IN 1899

(The numerals indicate hours per week)

<i>First year</i>	<i>Second year</i>	<i>Third year</i>
Anatomy, including dissection	Anatomy, comparative	Electricity
2	1	*
Chemistry, inorganic	Anatomy, regional	Ethics
2	1	*
Chemistry, laboratory	Bacteriology, didactic	History
4	4	*
Comparative anatomy	Chemistry, laboratory	Jurisprudence
*	4	0.5
Dental anatomy	Chemistry, organic	Operative dentistry
2	2	2
Histology, didactic and laboratory	Materia medica	Orthodontia, didactic
4	1	1
Materia medica	Metallurgy, didactic	Orthodontia, practical
*	1	1
Physiology	Metallurgy, laboratory	Pathology
2	2	1
Prosthetic technics	Operative dentistry, didactic	Prosthetic dentistry, didactic
10	2	2
	Operative technic	Surgery, general
	4	1
	Orthodontia, didactic	Surgery, oral
	*	1
	Orthodontia, technic	Therapeutics
	1	1
	Pathology	
	2	
	Physiology	<i>Infirmary:</i>
	2	Crown and bridge work
	Prosthetic dentistry, didactic	4
	2	Operative dentistry
		15
		Prosthetic dentistry
		8
	<i>Infirmary:</i>	
	Crown and bridge work	
	3	
	Prosthetic dentistry	
	5	
Total	37	37.5

* No specification of hours.

TABLE 2

DATA SHOWING THE DIVISIONS OF THE TEACHING TIME SPECIFIED IN THE CURRICULUM IN TABLE 1

<i>Subjects</i>	<i>Hours of instruction per week</i>				<i>Total number of hours: 5 years, 28 weeks each</i>
	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Total</i>	
Academic subjects	6	6	0	12	336
Medical sciences	8	11	0	19	532
Dental technology	10	7	0	17	476
Clinical medicine	0	0	3	3	84
Clinical dentistry	0	10	34	44	1,232
Miscellaneous	2	3	0.5	5.5	154
Total	26	37	37.5	100.5	2,814

rating (effective in 1917-18), though without allocation to particular years, the subjects and corresponding time allotments indicated in the first column of Table 3, on page 120. In 1918 and 1920, the Council proposed the modifications shown respectively in the second and third columns of Table 3. In 1922, having voted to include an entrance requirement of at least one year of approved work in an academic college among its standards for the Class A rating (beginning in 1926-27), the Council republished the specifications in the third column of Table 3, but refrained from suggesting any readjustments with the new conditions for admission, pending closer approach to the year of initial enforcement.

TABLE 3

DENTAL EDUCATIONAL COUNCIL'S SPECIFICATIONS OF SUBJECTS AND HOURS OF STUDY: AMONG THE MINIMUM REQUIREMENTS FOR A CLASS A RATING (1916, 1918, 1920, 1922)¹

(The numerals below the headings indicate the minimum number of hours in four years)

	1916	1918	1920 and 1922
Anatomy: dental	96	96	128
Anatomy: general	320	320	288
Anesthesia; see also physical diagnosis and anesthesia	...	...	16
Bacteriology	128	128	128
Biological chemistry (<i>see</i> physiological chemistry)			
Biology; see also physics or biology	...	...	96
Chemistry: inorganic, organic, physiological; and metallurgy	320	320	336
Clinical dentistry (<i>see</i> operative dentistry, clinics)			
Clinics: dental pathologic, exodontic, operative, oral surgery, orthodontic, prophylactic, prosthetic, radiologic	...	...	1,424
Crown and bridge technics (<i>see</i> technics)			
Drawing (<i>see</i> technical drawing)			
Dental anatomy (<i>see</i> anatomy)			
Dental history (<i>see</i> jurisprudence)			
Dental pathology and dental therapeutics; see also clinics	...	...	96
Dental rhetoric (<i>see</i> English)			
Dental therapeutics (<i>see</i> pathology)			
Economics (<i>see</i> jurisprudence)			
Embryology (<i>see</i> histology)			
English; dental rhetoric, seminar	96	96	96
Ethics (<i>see</i> jurisprudence)			
Exodontia; see also clinics	...	...	16
History: dental (<i>see</i> jurisprudence)			
Histology: including embryology, since 1920	128	128	144
Hygiene: oral	...	32	32
Jurisprudence, dental history, economics, ethics	32	32	32
Materia medica: including pharmacology and general therapeutics since 1920	64	64	64
Medicine (<i>see</i> physical diagnosis)			
Metallurgy (<i>see</i> chemistry)			
Operative and clinical dentistry; see also clinics	1,300	1,300	...
Operative dentistry; see also clinics and technics	...	...	96
Operative technics (<i>see</i> technics)			
Oral hygiene (<i>see</i> hygiene)			
Oral surgery (<i>see</i> surgery)			
Orthodontia; see also clinics and technics	96	96	32
Orthodontic technics (<i>see</i> technics)			
Pathology, general; see also dental pathology	128	128	80
Pharmacology (<i>see</i> materia medica)			
Physical diagnosis and anesthesia; see also physical diagnosis, anesthesia	32	32	...
Physical diagnosis and principles of medicine	...	...	16
Physics; see also physics or biology	...	...	48
<i>Carried forward</i>	<u>2,740</u>	<u>2,772</u>	<u>3,168</u>

¹ The numerals in the headings indicate the years in which the specifications were published by the Council. There has been no revision since 1920.

TABLE 3 (continued)

<i>Brought forward</i>	2,740	2,772	3,168
Physics or biology, or both; see also biology, physics	192	192	...
Physiological chemistry (<i>see</i> chemistry)			
Physiology	128	128	144
Prophylaxis (<i>see</i> hygiene, clinics)			
Prosthetic dentistry; see also clinics, technics	...	...	64
Prosthetic technics (<i>see</i> technics)			
Radiology; see also clinics	16	32	16
Seminar (<i>see</i> English)			
Surgery, oral: principles; see also clinics	96	96	32
Surgery: principles	...	...	16
Technical drawing	48	48	48
Technics: crown and bridge	320	320	224
Technics: operative	160	160	192
Technics: orthodontic	...	...	48
Technics: prosthetic	384	384	448
Therapeutics (<i>see</i> materia medica, dental pathology)			
Additions to the above, or other subjects	316	268	...
Total	4,400	4,400	4,400

TABLE 4

COMPARISON OF THE DIVISIONS OF THE TEACHING TIME SPECIFIED IN THE CURRICULA OUTLINED IN TABLES 1, 2, AND 3

Subjects	Curriculum approved by the National Association of Dental Faculties in 1899		Curriculum recommended by the Dental Educational Council in 1920 and reaffirmed in 1922 ¹	
	Total number of hours (3 years)	Percentage of the total number of hours	Total number of hours (4 years)	Percentage of the total number of hours
Academic subjects	336	11.9	492	11.2
Medical sciences	532	18.9	890	20.2
Dental technology	476	16.9	960	21.8
Clinical medicine	84	3.0	48	1.1
Clinical dentistry	1,232	43.8	1,808	41.1
Miscellaneous	154	5.4	202	4.6
Total	2,814	99.9	4,400	100.0

Meanwhile, individual schools, particularly those that now base their curricula on one or two years of work in an academic college, have given the Council's specifications wide variation in scope, year assignments, hour allotments, and sequence; and the Council, wisely regarding the period since 1921 as essentially transitional, has lately been encouraging experimental deviations. The Council's curriculum continued the over-emphasis on dental mechanics in the training of dentists, and further reduced the number of hours devoted to the correlations between clinical dentistry and clinical medicine, as may be seen from the comparative data in Table 4. Instead of convergence toward medicine, as the founders of modern dentistry preferred to guide its course, there has been steady

¹ Of 336 hours for chemistry, physiological chemistry, and metallurgy, collectively, 252 are allotted here to chemistry, 42 to physiological chemistry, and 42 to metallurgy.

divergence, and the difference between the medical and dental curricula has tended to become more and more pronounced.

c. Dental and medical curricula for 1925-26 contrasted

An advanced dental curriculum, now enforced by the Regents of the State of New York (1925-26), is shown in Table 5, where, compared with the official medical curriculum for the same year, the extent of the present disagreement between typical dental and medical curricula may be directly noted. The most striking general contrasts in Table 5 are the discordance between the prescribed minimum total numbers of hours (medicine, 3600; dentistry, 4000); the inequality of attention to the medical sciences (51 per cent for medicine, 39.7 per cent for dentistry);¹ the omission of dental pathology, clinical dentistry, and oral surgery from the group of subjects named in the medical curriculum; and the larger proportion of time allotted in the dental curriculum to the special and clinical phases of the instruction (49 per cent for medicine, 57.4 per cent for dentistry). Minor disparities are apparent on almost every line in the Table. These particular divergences are expressive of the wide general difference between present medical and dental curricula, especially in the depth and breadth of their pre-professional foundations, the degrees of their utilization of mechanical and biological sciences, and the nature and range of their clinical applications.

B. REQUIREMENTS IN PRE-PROFESSIONAL EDUCATION

a. Influence of the National Association of Dental Faculties in raising the requirement to graduation from a high school

It has already been indicated that before the advent of the National Association of Dental Faculties, in 1884, there were no general academic standards affecting admission to dental schools, and that practically all candidates were accepted without special regard for their intellectual qualifications. The Association at its first meeting took the initial step toward emergence from this primitive condition by requiring applicants for admission to the first year, thereafter, to "possess a good English education," as determined by a preliminary examination. A candidate who presented a diploma from a reputable school, "or other evidences of literary qualification," was admissible without examination. A year later the Association voted that the applicant to be examined should write an English composition of at least two hundred words on a subject selected by the examiners, the faculty to determine whether the candidate should be examined also

¹In this calculation, the reservation for organic chemistry (combined indefinitely with physiological chemistry in the dental curriculum) is included in that for the medical sciences. The allotment for dental anatomy in the dental curriculum contains an unspecified reservation for "operative technic." Therefore, the hours in the dental curriculum that are devoted to the medical sciences, including such as special dental anatomy, dental histology, and dental pathology, do not exceed 35 per cent of the total of 4000 hours.

TABLE 5

COMPARISON OF THE MEDICAL AND DENTAL CURRICULA ENFORCED BY THE REGENTS OF THE STATE OF NEW YORK IN 1925-26

<i>Subjects</i>	<i>Medical curriculum</i>	<i>Dental curriculum</i>
I. ANATOMY	648	570
Gross anatomy	+ ¹	+
Histology	+	+
Embryology	+	-
Dental anatomy and histology	-	+
Physiology and chemistry	432	480 ²
Organic chemistry	-	+
Physiological chemistry	+	+
Pathology	432	360
Gross pathology	+	+
Pathological histology	+	-
Bacteriology	+	+
Dental pathology	-	+
Hygiene	108	120
Oral prophylaxis	-	+
Pharmacology and therapeutics	216	60
Pharmacology	+	-
Materia medica	-	+
Total for the division (I)	1,836	1,590
II. MEDICINE	900	60
Pediatrics	+	-
Nervous and mental diseases	+	-
Dermatology	+	-
Syphilis	+	-
Medical jurisprudence	+	-
Surgery	612	55
Orthopedics	+	-
Genito-urinary diseases	+	-
Ophthalmology	+	-
Otology	+	-
Laryngology	+	-
Rhinology	+	-
Roentgenology	+	+
Obstetrics and gynecology	252	None
Total for the division (II)	1,764	115
III. ORTHODONTIA	None	105
Oral surgery	None	120
Dentistry	None	2,070
Dental technology	-	+
Metallurgy	-	+
Prosthetic dentistry	-	+
Operative dentistry	-	+
Crown and bridge work	-	+
Principles of practice	-	+
Total for the division (III)	None	2,295
Grand total, divisions I, II, and III	3,600	4,000

¹ The + sign indicates that the corresponding subject is included in the curriculum; the - sign, that it is not. In the medical curriculum the hours for the individual courses are not indicated; in the dental curriculum the number for each is specified.

² The preponderance of allotted hours for physiology and chemistry in the dental curriculum is due solely to the inclusion of organic chemistry in that curriculum, which is based on one year of work in an academic college, and its exclusion from the medical curriculum, which is based on two years of work in an academic college.

in arithmetic, English grammar, geography, "government topics," or modern history. At the same meeting a series of examination questions on each of these five subjects was presented by a special committee for the use of the faculties in their preliminary examinations of students for the year 1885-86. A similar series was issued in 1886, for arithmetic, astronomy, geography, geometry, government, history and literature, language, and physics. In 1891, when the curriculum was about to be lengthened to three years, and the effect of this step on the attendance was uncertain, the Association tabled a committee's recommendation that the Committee on Schools be instructed to prepare three hundred questions, from which each school should select a number suitable for its admission examinations in botany, English, history, mathematics, physics, physiology, and zoology. The rejected recommendation included an indication of the scope of each subject, and designations of text-books.

During the earlier years of the National Association of Dental Faculties, the meetings, attended by the owners and chief executives of the schools but not by the faculties, were enlivened by spirited contests between those who aimed primarily to promote the usefulness of dental schools as agents of professional education and those who sought chiefly to enhance the value of dental schools as commercial enterprises. The former, in order to promote the quality of the dental training and the character of the professional work, advocated higher requirements in preliminary education, despite prospective decreases in enrolments. The second group, encouraged and supported by influential manufacturers and distributors of dental merchandise, favored conditions of easy entrance to the dental schools, in order, by maintaining a growing supply of students, to derive cumulative profits from the fees for tuition and for the service given by students to patients in the infirmaries. Fortunately, the men of true professional purpose, despite continual discouragement, gradually attained the ascendancy, and, after a decade of effort in this relation, were able to raise the minimum entrance requirement to the equivalent of that for admission to a high school (1897), and then successively to completion of one (1899), two (1902), and three (1907) years of high-school study, graduation from a high school (1910),¹ and graduation from a four-year high school (1917). In 1917-18 the dental curriculum itself was extended from three years to four years. These and related developments are summarized on page 55; the premature extension of the dental curriculum from three years to four years in 1903-04 is mentioned on page 50.

b. Influence of the Dental Faculties Association of American Universities in raising the requirement to a year of work in an academic college

In 1917, the Dental Faculties Association of American Universities pointedly raised the question whether the study of dentistry should be continued on a high school foun-

¹This was not an advance for schools that admitted graduates of two-year and three-year high schools, which then were numerous.

dition, or based on one year of work in an academic college, and recommended early adoption of the more advanced pre-dental standard. In 1921, five years after a university dental school began to exact two years of work in an academic college for admission, and a year after one of the schools represented in that Association had inaugurated the one-year requirement, nine of the other ten schools then members of the Association, and five additional schools, began to enforce the one-year standard, which, by growth of approval, is now (1925-26) a minimum in twenty-eight of the forty-four schools in the United States. In October, 1922, the Dental Educational Council announced that, beginning in 1926-27, this entrance prerequisite will be included among the minimum requirements for the Council's Class A rating, and in November, 1924, also voted to make it essential simultaneously for a Class B rating. Four schools now independently require two years of work in an academic college for admission, and two more will begin to enforce that standard in 1926-27, when it will be the legal minimum for all of the schools in the State of New York. In September, 1925, the School of Medicine and Dentistry of the University of Rochester offered instruction in dentistry on an entrance requirement of three years of work in an academic college, but no dental students qualified for admission.

c. Comparison with pre-medical requirements

Dental education is now about a decade behind medical education in the enforcement of academic prerequisites. In 1900 less than 25 per cent of the number of medical schools exacted graduation from a high school for admission, although two schools of a total of 160 in that year required additional work in an academic college. The number of medical schools that based their curricula on graduation from a high school, or on a higher standard, increased to about 50 per cent in 1907 and to about 75 per cent in 1910, when forty schools of a total of 131 required one or two years of work in an academic college. In 1914, when the Council on Medical Education made the admission requirement of at least one year of work in an academic college essential for a Class A rating, seventy-eight of the 106 schools then existing enforced that standard. Since 1918 two years of such work have been the minimum in practically all reputable schools of medicine, but an increasing number require three years, and several base their curricula on the work represented by a baccalaureate degree.

Table 6, on page 126, presents a comparison between the minimum academic requirements for admission to medical and to dental schools in terms of the standards of the Council on Medical Education and Hospitals of the American Medical Association, which have been in effect since 1918 in all acceptable medical schools, and those of the Dental Educational Council of America, which in 1926-27 will become effective in all Class A and Class B dental schools. The main differences between the two standards are the medical suggestion of particular subjects for eight of fifteen units of high-school

TABLE 6

SUMMARY OF PRE-PROFESSIONAL ACADEMIC STANDARDS FOR MEDICAL EDUCATION AND DENTAL EDUCATION, AS SPECIFIED BY THE COUNCILS ON MEDICAL EDUCATION AND DENTAL EDUCATION

	Medicine (Effective in practically all schools since 1918)	Dentistry (Effective in a majority of the schools since 1924-25)
I. <i>Graduation from an accredited secondary school— high school or equivalent:</i>		
Length of curriculum (years)	4	4
College entrance units—total number	15	15
Number of units for required subjects: ¹		
English literature and composition	3	
Foreign language	2	
Elementary algebra	1	
Plane geometry	1	
History	<u>1</u>	<u>—²</u>
Number of elective units (twenty-four suggested subjects, none for more than two units)	7	<u>—²</u>
Full equivalent of the above	+ ³	+ ³
II. <i>Successful work in an accredited academic college:</i>		
Period (years)	2	1
Semester hours—total number	60	30
Number of semester hours in required subjects:		
Chemistry	12	6
Physics	8	<u>—²</u>
Biology	8	6 ⁴
English composition and literature	<u>6</u>	<u>6</u>
Number of elective semester hours:		
Non-science subjects	12	<u>—¹</u>
Miscellaneous (seventeen subjects suggested, only one—modern foreign language, 12—for more than 6 hours)	<u>14</u>	<u>12¹</u>

study, and the lack of such indications for dentistry; sixty semester hours in an academic college for medicine, thirty for dentistry; thirty-four semester hours in four required academic subjects for medicine and only eighteen hours in three of the four for dentistry; and in the medical standard the allotment to physics of eight semester hours in an academic college, and in the dental standard the option to include physics in the high school or academic college to the extent of one secondary-school unit. As a rule, prospective dental students meet the requirement of physics in the high school.

¹ The Dental Educational Council does not specify required subjects in the high school. This schedule, published by the Council on Medical Education for its suggestive value only, includes the subjects that are commonly required by the high schools for graduation. "Credits for admission to the premedical college course may be granted for the subjects shown in the accompanying list [above], and for any other subject counted by a standard accredited high school as a part of the requirements for its diploma"—as the accredited academic colleges may determine.

² In the dental standard, physics is a required subject that may be taken in a high school or academic college, but in either case the time devoted to it must be equal to that of one secondary-school unit.

³ The "full equivalent" of the required secondary-school education must be demonstrated, for *medicine*, by examinations conducted by the College Entrance Examination Board, or by the authorized examiner of an approved standard college or university; it must be attested, for *dentistry*, by the highest public educational officer or organization of the corresponding state. The Council on Dental Education requires at least 90 per cent of the number of students in a class to be high-school graduates.

⁴ In the dental requirement, zoology may be substituted for biology.

In view of the increasing emphasis upon applied mechanics in the dental curriculum, the disregard for mathematics and physics in the pre-dental standard not only is anomalous but also suggests that much of the training in dental technology is empirical in character. An admission requirement of two years of approved work in an academic college would make it possible to give the principles of mathematics, and of physics including mechanics, the attention these fundamental aspects of dental practice require. The subjects in the Dental Educational Council's professional curriculum (Table 3) that could be taught to greater advantage in an academic college, and for which 604 hours are reserved, are biology (96), chemistry (252),¹ drawing (48), English (96), the esthetic features of dental anatomy (64—estimated as one-half of the allowance of 128 hours), and physics (48).

In the Introduction to the present Bulletin it was suggested that although dentistry, a highly mechanical division of the healing art, is not practice of medicine in the conventional sense, it is nevertheless a form of health service that should be made fully equivalent to an oral specialty of medicine in the quality of its diagnosis and treatment. Considered as a whole, the practice of dentistry is, in effect, a combination of the principles of medicine and mechanics, largely on the basis of fine art, applied to the teeth and mouth. Oral health-service, with correlative systemic health-service, are its fundamental purposes; mechanical procedures are its chief ways and means; and artistic oral restorations and substitutions are its esthetic achievements. Such relationships and duties present the responsibilities of a learned profession, and should rest on a commensurate educational basis.

If it be conceded that dentistry is a mode of health service that requires an understanding analogous to that demanded of practitioners of accredited specialties of conventional medicine, and in addition exacts a broad comprehension of mechanical principles as well as a sensitive esthetic appreciation, it would seem to be inevitable that pre-dental education should be similar in general scope and equal in quality to that of pre-medical education, in order to ensure desirable intellectual parity between prospective students of medicine and dentistry, and equivalent capacity to master their responsibilities as practitioners. After medicine tested for four years a requirement of one year of work in an academic college and found it impracticable and inadequate (1914-18), the minimum was raised to two academic years. All of the reasons for the acceptance of the higher standard by medicine, after a four-year trial of only one academic year, apply with equal force to early adoption of the two-year prerequisite for the oral division of health service. There is an additional reason: medicine, having tried the two-year requirement, retains it because it has been found to be desirable for all classes of medical practitioners.

¹ Estimated to be about three-fourths of the Council's allowance of 336 hours for chemistry, physiological chemistry, and metallurgy, collectively.

C. PRESENT CONDITIONS AFFECTING THE DENTAL CURRICULUM

a. Mechanical aspects

The practice of dentistry is accomplished almost entirely by mechanical means and is manually the most highly specialized mode of health service. Not only must a dentist know how to perform particular operations and how to direct others to cooperate, but he himself must also skilfully do many difficult things in the mouths of his patients. Although guidance of both patients and practitioners may be made a useful agency of oral health-service, dentistry cannot be practised to any great extent by merely offering advice, or writing prescriptions, or giving instructions. On the contrary, it demands of the practitioner very special mechanical ability and uncommon operative precision in many types of delicate adjustments to microscopical limits of exactness, and to exceptional degrees of perfection and permanence, chiefly in tissues which, being devoid of active nutrition, are unable to "heal" after injury or to replace any portion of their masses after removal. Just as internal medicine attracts the mind that prefers to struggle with intricate problems, and is not discouraged by the uncertainties and disappointments involved in treatment by advice or with drugs; or as surgery interests one who prefers more definite duties, and the greater assurance of success in amelioration that is obtainable with the scalpel; so dentistry appeals to the aptitude that is at its best in the performance of objective tasks, within a closely circumscribed field, directly and accurately by skilled instrumentation.

Although the founders of the earlier dental schools aimed to give dentistry the quality of an important branch of surgery, then relatively crude, and to base it on the medical sciences, they did not minimize the importance of the technical aspects of dental practice, and sought to achieve the elevation of dentistry by improvement of all of its phases. But, in the development of the dental curriculum as the dental schools multiplied, mechanics grew steadily in relative accredited importance, with the rise in the confidence of dentists in their professional future and in their devotion to their organized independence, and with the fall in the comparative number and influence of physicians associated with the management of dental education. In 1893, two years after the curriculum had been lengthened from two years to three, prominent dentists, impressed by the growth in the variety and complexity of the operative procedures in dental practice, appreciating the necessity for adequate mechanical skill in the use of the improved methods, and emphasizing the need in the extended curriculum for better teaching of dental technology, aimed to promote these objects by organizing the National School of [Association for] Dental Technics (page 51). The activities of this Association resulted not only in improving the quality of such instruction, but also in creating a general belief that much more time than that previously allotted in the curriculum was necessary for the development of the requisite digital facility.

The present degree of esteem in which manual dexterity is held by dentists, and the general expectation that dental faculties will develop it in the students, are indicated by the fact that, in the Dental Educational Council's curriculum (Table 3), the minimum total number of hours reserved for all of the medical sciences is 890, but for the various forms of dental technology it is 960, this total being divided among crown and bridge technics (224), operative technics (192), orthodontic technics (48), prosthetic technics (448), and technical drawing (48). Including the hours allotted to dental anatomy (128), which are devoted largely to the development of skill in tactual procedures, the amount of time reserved for elementary dental mechanics is practically equal to one-fourth of the entire curriculum or to one academic year. In these courses, by means of infinite detail of ingenuity in the perfection of mechanical processes, the students are taught the technical methods they repeatedly apply in their clinical practice in the infirmary, for which the Council's curriculum reserves 1424 hours in addition.

In most dental schools the technical subjects are taught directly and practically, on the whole poorly, and as a rule by inexperienced demonstrators. Broad foundations are not laid in the essentials of mathematics, physics, and mechanics, and these sciences are usually correlated very superficially when they are not ignored. Therefore, many mechanical phases of dentistry are often practised empirically and in ways that are productive of preventable pathological consequences. Thus, irritations by ill-fitting dental restorations frequently incite the development of cancer in the mouth. Scientific knowledge of mechanics and sound biological application of mechanical principles in dentistry are demanded by every consideration of faithful professional service, but, as a rule, such knowledge and such practice cannot be attained readily by men whose minds have not been prepared by suitable education to achieve them. In the Dental Educational Council's curriculum (Table 3), only 48 hours are assigned to physics, presumably including mechanics, and it may be passed in a high school. Education in physical and mechanical principles for the promotion of clear understanding, development of power of constructive imagination, and accumulation of mental resources of adaptability, in emergencies or under the stress of need for special or general improvement of procedures or for invention of means, is being subordinated to the immediate purpose to develop skill in technical mimicry. Practice in manual procedures, which is essential for the attainment of digital facility, is often carried to an enervating extreme, yet is traditionally interrupted by long summer vacations. The instruction in dental technology, which is usually uninspiring and listless and lacking in effectual organization, is characterized by unprofitable repetition, chiefly because many of the teachers, who are practitioners on part-time and half-hearted service, have only empirical knowledge of their subjects, and proceed as they might if they were training apprentices in tinkering. Dawdling characterizes the mental and physical reactions of many of the students and instructors in the

technical laboratories, and as a consequence much time is wasted that might be saved under a more effectual and intensive system of education.

At present dentistry consists mainly of the treatment of diseases, disorders, and deficiencies of the teeth and of the closely adjacent tissues, and also of the amelioration of the consequent disabilities, and there is no immediate prospect that these responsibilities of dental practice will not steadily increase. Therefore, the importance of the principles of mechanics, and of their scientific applications in the bio-technical realignment, rebuilding, reparation, and replacement of natural teeth and in their accessory procedures, must not be underestimated. But in the dental curriculum this importance should be manifested in appreciation of the need not only for manual dexterity, but also for corresponding mental aptitude and capacity; and the training in mechanics, coördinating the two requirements, should take the form of a superior plan of integrated instruction, not of an excessive reservation of time. Technical dental service requires a natural or acquired type of mind that is quick, resourceful, and inventive in developing mental pictures, which, with suitable materials under skilled fingers, become realities. The preparatory education of the prospective dentist should disclose this type of ability, if it is not non-existent. Successful dental service necessitates (*a*) preliminary study of conditions, (*b*) evolution of the plan of procedure or construction, (*c*) the procedure or construction itself, which may be accomplished intra-orally by the dentist, or extra-orally by technicians, or coöperatively by both, (*d*) installation of the construction, to function with the dental parts and the adjacent living tissues, and (*e*) such further arrangements and service as may be required to keep the dental parts and the adjacent living tissues in a state of health. The close similarity between these requirements and those of general engineering is patent and significant. Routine training for manual dexterity and skill in technical mimicry that fails to develop or to improve in the dentist the mental qualities that are notably exhibited by the engineer, misses an essential purpose of dental technology. Violinists or pianists may have extraordinary digital skill and yet be unable to plan or construct the simplest object or conduct an ordinary mechanical operation. They may lack the constructive aptitude that a training in dental technology should be planned to elicit or to develop.

Dental schools are devoting a large proportion of the curriculum to mechanics, and, notwithstanding the prevailing superficiality of the instruction in this branch of dental technology, there has been no lack of general appreciation of the importance of "technics." In the present allusions to current methods of instruction in mechanics, and by emphasis elsewhere in this Bulletin upon other desiderata, it is not the writer's intention to minimize an essential element of dental practice but rather, regarding mechanics and its proper applications as admittedly fundamental, to stress the phases of oral health-service that dentistry has been less inclined to advance. Dental practice is not merely mechanics and engineering, or esthetics and fine art, or biology and medicine, but all of these

in equilibrium, in accordance with the requirements of the individual case, where the dentist's judgment determines the contribution of each to the treatment complex. It is the ideal of dental education to make the judgment sound and the treatment perfect in every instance. No one would knowingly seek the practical service of a dentist who, although he completely understood the medical aspects of the condition, lacked the complementary technical concept with the attendant special knowledge and skill. Yet, in any estimate of dental practice, the adequacy of its health service, immediate and continued, should be the primary consideration for the conscientious practitioner.

b. Esthetic phases

In 1872, at the Commencement exercises of the Dental Department of Harvard University, in an address on "the claims of dentistry," Oliver Wendell Holmes said, in part :

"There is no pearl in any royal crown for which a young queen would give one of her front incisors. . . . The teeth, in their relation to the beauty of the human countenance, have figured in poetry from the earliest times. . . . Their whiteness has been compared to that of snow, of Parian marble, and of pearls, until verse is tired of the images. The ancient poets and satirists are full of allusions to the beauty and deformity depending on the conditions of the teeth. . . . Men can often conceal the imperfection of their dental arrangements by letting the eaves of a heavy mustache overshadow their mouths. But to women, to hide whose smile would be to take away half the sunshine of life, and to whom Nature has kindly refused the growth that would deprive us of it, there is no element of her wondrous beauty which can take the place of white, even, well-shaped teeth. And as beauty is not a mere plaything, but a great force, like gravity or electricity, the art which keeps it, mends it, and, to some extent, makes it, is of corresponding importance."

These interesting remarks by Holmes reflect the traditional attitude toward the esthetic aspects of restorative dentistry, and indicate the general reasons not only for the care that the earnest dental practitioner deservedly gives to artistic oral craftsmanship, but also for the special attention that ought to be accorded to art in the education and training of dentists. In constructing a dental restoration or substitute that is visible in the mouth, but especially in replacing one or more anterior teeth, the dentist has an opportunity to improve the beauty and dignity of the human face, which is a responsibility and a privilege that demand serious intention, and also a knowledge and appreciation of the fundamental principles of art. Judging from current comment among practitioners, most of the full artificial dentures now being made and inserted are caricatures of what should and might be used, if dentists were well trained in the esthetics of this branch of their work. The prosthetic or reconstructive phase of dentistry is one of the minor beautiful arts of form. It is significant in this relation that ivory turners, goldsmiths,

jewelers, and similar workers in the lesser fine arts were among the leading dentists during the era when all dental practitioners were trained by apprenticeship, and dentistry consisted in the main of the production and the placement of artificial substitutes for teeth; that many dentists have been actors, architects, artists, musicians, poets, and sculptors; and that one, Charles Willson Peale, was a founder of the first society of fine arts in America.

The dentist, in replacing portions of the dentition, or in adjusting the jaws and parts of the countenance to more comely adaptations, should be intimately versed in the surface relationships of the teeth, mouth, face, and head, as well as in the intricacies of the whole masticatory mechanism at rest and in action. Like a sculptor, he should comprehend all of the conditions for beautiful reproduction in solid form. Dental architectonics may afford pleasure by the qualities of proportion, fitness, and harmony of the parts; by the variety and relation of surfaces, contours, and intervals; by contrasts of light and shadow and disposition of color; by regularity and its diversity; and by happy expression of physiognomonic ideals. In such work of readjustment or reconstruction, largely plastic art, there may be imitation of shape by means of carving, cutting, or grinding hard materials; by modeling from soft masses, such as waxes; by casting from viscous or molten matter, such as plaster or metal; by beating, drawing, or chasing of malleable or ductile metals; and by stamping from dies or molds. Vitreous pigments may be spread in a state of fusion for tinctorial effects when hardened, as in artificial enamel, and tinted parts may be so fitted together, in harmony with the color of the skin, lips, and associated teeth, that in union their effect is that of a picture. The most beautiful dental reconstructions are works of art rather than mechanical duplicates; they are idealized imitations founded on essential realities, such as the necessities of normal occlusion and the esthetic relation of tooth form to face form, rather than reproductions of all observed minutiae in the originals. The common practice of imitating in artificial teeth the defects in natural teeth, in the effort to deceive the observer into the belief that the teeth are natural because defective, clearly indicates a lack of artistic insight.

Notwithstanding the importance of esthetics in reconstructive dentistry, little attention is given in dental schools to education in taste and beauty that is not incidental to the improvement of digital facility. The only subject in the Dental Educational Council's curriculum (Table 3) that appears to be directly related to esthetics is technical drawing (48 hours), although much of the work in dental anatomy (128 hours) is usually devoted to carving, modeling, and drawing, and to the development of concepts of tooth form; but both of these subjects are taught quite as much for the purpose of increasing manual skill as for any other, and are thus impressed upon the student. A dentist should obviously possess a technique that is fully adequate to the execution of his purposes, but it is a mistaken view of the efficacy of dental technology to assume that, for the attainment

of success in oral prosthesis as in the mechanical arts, it is sufficient merely to learn the rules and to apply them often enough to gain facility from repetition. This will do for a plumber but not for a modern dentist. In addition to manipulative skill and efficiency in the application of rules, precepts, formulas, and other devices in conventional procedures to particular ends, the disposition and mental attitude of the practitioner himself are essential elements in an artistic achievement. Imagination and esthetic idealization are requisite factors beyond the reach of rules and their application; they express the practitioner's love of beauty and the complex play of aspirations, emotions, faculties, instincts, preferences, and reminiscences in his own nature that may be effectually coördinated by apprehension and study of the esthetic qualities of fine art. Consequently, the prospective general practitioner of dentistry should be educated and trained to be not only a dental craftsman, versed in the regulations and competent in the communicable artifices and dexterities of dental technology, but also an oral architect and an oral sculptor, with capacity to exercise an artist's freedom of choice within the scope of the biological limitations imposed upon him. He should be taught to understand that in his prosthetic work unidealized imitation and mere facility in its execution may be inadequate, but that the greatest esthetic successes can be achieved and the highest degrees of health service performed only through felicity in the mechanical and sanitary embodiments of ideals of beauty. He should comprehend that of the two types of attainments, the facile of the artisan or the felicitous of the artist, the latter is the more important, for a practitioner who can idealize and model, design or plan, and esthetically and biologically evaluate an appliance, need not be his own executant of the extra-oral procedures, but may obtain the help of a technician in the purely mechanical aspects of the work; and, where he can devote practically all of his time to intra-oral service for his patients, it would be a waste of his more valuable talent if he did not obtain such assistance for that purpose.

Neglect of esthetics in dental technology, exaggeration of the value of unidealized imitation and of excessive repetition in digital procedures, disregard for the facts that laboratory artisans do the extra-oral work on appliances for most of the busiest practitioners and that need for such manual assistance is steadily growing, and unwillingness to conduct or to encourage the formal training of technicians, are prevailing conditions in the dental schools that lend emphasis to the suggestion that an inordinate amount of time is now being given in the dental curriculum to apprenticeship training in mechanics.

c. Medical relationships

1. Medical sciences

For many centuries loss of teeth, which was accepted as inevitable and regarded primarily as a disfigurement, did not excite the interest or concern of medicine. Troublesome teeth were usually pulled out or broken off by any one disposed to extend the favor, and the replacement of the main parts of lost teeth, chiefly to disguise deformity and

thus for esthetic reasons, became a special mechanical craft. Dentists, steadily improving their manifold procedures and extending the scope of their service, gradually gave artificial dental substitutes and restorations increasing artistic acceptability and functional utility. When the founders of modern dentistry, having failed in an effort to develop their art within the scope of the practice of conventional medicine, inaugurated the movement to make dental practice an independent division of surgery without impairment of its traditional esthetic purposes, and so designated it, they initiated the evolution that has gradually made dentistry, including the border domain of oral surgery, not only a mechanical means to maintain or restore dental functions and facial comeliness, but also a division of health service of universal need and applicability.

The practice of dentistry in the United States and Canada is not an accredited part of the practice of conventional medicine, and has not been conditioned on acquisition of the medical degree. The fundamental reason for a continuance of this seeming anomaly was set forth in some detail in the Introduction of this Bulletin. The technique of the practice of dentistry in its entirety is so detailed and precise mechanically, so varied and exacting esthetically, and, compared with the general practice of conventional medicine, so restricted in both the occasions for systemic treatment and the use of means therefor, that superimposition of a full training in dentistry on a complete undergraduate medical curriculum, as a minimum requirement, would be redundant in its extent, prohibitive in its demands, and undesirable in its economic and social effects. Nevertheless, the practice of dentistry is, in effect, the oral specialty of the practice of medicine, and therefore should attain the full service equivalence of such a specialty. Debilitating and often fatal disorders are caused directly or indirectly by microorganisms that enter the body through cavities in teeth, or from abscesses or other pathological processes at the roots of teeth, or through defects in tissues surrounding teeth, or from fragments of teeth remaining after imperfect extractions. These serious consequences of dental ailments, as well as the nature of some dental and oral disorders caused by systemic diseases, make it necessary for dentists to be not only expert in the art of realigning, repairing, removing, and replacing teeth, but also able to understand the causes of dental and oral maladies and to control or treat them—competent to give advisory service to patients directly, and to cooperate efficiently in consultations with physicians, on matters affecting particularly the relationship between a patient's teeth and mouth and the body as a whole.

Promotion of the public welfare requires dental surgeons to be as responsible, intelligent, well educated, thoroughly trained, and broadly experienced as physicians, and to be as competent to understand and to perform the health-service duties of dental practice as an oto-laryngologist or an ophthalmologist in his particular field. To regard dentistry as a mechanical art that requires little or no medical education is as unintelligent and as uninformed as to assume that abdominal surgery is nothing more than biological joinery. Each is the practice of health service by mechanical procedures, but both may

have fatal consequences from lack of medical understanding, whatever the degree of manual skill in their execution. If dentistry were not a division of the healing art, education of prospective dental practitioners in such medical sciences as bacteriology and pathology, which now are included in every dental curriculum, would be superfluous. If dentistry were merely dental mechanics, a two-year course in dental technology, based on graduation from a high school and conducted along lines similar to those for the education of optometrists, would probably afford sufficient training for dental practice, and oral health-service could be reserved for a new specialty to include oral surgery, which might be named stomatology and made analogous to ophthalmology and other specialties of medicine. But with dentistry developed into the full service equivalence of an oral specialty of medicine, the creation of a medical specialty of stomatology would be redundant — and there would be no occasion to substitute “stomatology” for the name established by custom.

Dentistry has not yet attained the full equivalence of an oral specialty of medical practice, and medicine has been indifferent to the need for such a development. In the Dental Educational Council's curriculum (Table 3), the minimum total allotment of hours for medical sciences is approximately 890, divided among bacteriology (128), general pathology (80), gross anatomy (288), histology and embryology (144), materia medica, pharmacology, and general therapeutics (64), physiological chemistry (42 — estimated as one-eighth of the requirement of 336 hours for chemistry, physiological chemistry, and metallurgy), and physiology (144). Medical and dental requirements in medical sciences are compared in Table 5 and discussed on page 122. In the best dental schools, the reservations of hours for special attention to medical sciences are not inadequate, but the use of the allotted time is not so fruitful as it should be. Many dental faculties, paying perfunctory attention to medical sciences, have regarded courses in these subjects as desirable in accordance with tradition in the conduct of dental schools, but as units of “theory” chiefly, to be passed and their contents applied incidentally; and, glad to be relieved of the obligation to give instruction in such “necessary evils” by turning over the work to teachers in the medical laboratories, have seldom been inclined or able to advise suitable adaptations of the courses to dental needs. In the university dental schools at present, most of the courses in medical sciences are given under the auspices or with the assistance of the medical faculties, to dental students in separate classes as a rule, usually in the medical laboratories, but often by the least experienced teachers in the medical departments. In most instances this service is accorded by medical faculties from requirements of economy and considerations of common sense in the coordination of the work of the respective universities; but, because of traditional disrespect for dentistry and failure to appreciate its health-service responsibilities, the cooperation is usually given grudgingly, in most instances indifferently, and in some cases very poorly.

The prevailing attitude of the medical faculties toward dental education may be illustrated by two typical incidents of recent occurrence. During a discussion of professional experiences, a group of medical professors in universities holding membership in the Association of American Universities enquired of one of their number, who had lately gone to a new post, how his work was progressing. "Very satisfactorily in all respects but one," he said: a member of his staff was "so hopelessly inefficient that the only thing to do about it for the rest of the year was to put him in charge of the dental students." This solution was regarded, by most of those to whom it was stated, as a suitable way out of the predicament. The victims were students at a Class A dental school. On another occasion, the dean of a school of medicine with which a Class A school of dentistry was intimately associated, and where complete rebuilding of the medical school was contemplated, when asked, "Are you planning to include the dental school in the medical centre on the new site," replied: "No, we are not planning to include the dental school, we are planning to exclude it." The intended elimination has been carried to complete success, with results that may involve the extinction of the dental school. Medical schools collectively, and schools of hygiene and public health, pay little or no attention to oral hygiene; ignore clinical dentistry; overlook the important relations of disease and abnormality of the teeth to the general health; do not even provide for training in oral surgery; teach their students to inspect a patient's tongue and the oral tissues, but to disregard his teeth; and in general, so far as dental disorders are concerned, violate not only the dictates of medical common sense but also reject such wisdom as that expressed by Sir William Osler when he wrote: "There is not any single thing more important to the public in the whole range of hygiene than the hygiene of the mouth. If I were asked to say whether more physical deterioration was produced by alcohol or by defective teeth, I should unhesitatingly say defective teeth." The failure to encourage and to advance the development of clinical dentistry is a regrettable phase of medical history. When it is recalled that a generous and confiding public, following the promptings of medical leadership, has given to medicine enormous sums of money intended to support impartially and without prejudice all suitable efforts to keep people well, the indifference in medical schools to the diseases of the teeth and mouth and their systemic sequelae, and to the promotion of medical understanding and competency in those who aim to devote themselves professionally to oral health-service, cannot be regarded as reasonable or worthy.

2. *Clinical medicine*

An oral or dental appliance or procedure that violates physiological principles or disregards biological conditions, even though it be mechanically and esthetically perfect, may be tragic in its consequences of distress, disability, or disease. Dentists should be able to determine whether their patients are able to withstand the effects of prospective treat-

ments, especially those of local or general anesthesia. Dentistry cannot attain the full service equivalence of an oral specialty of medicine without close observance of the related principles of medical practice and without adaptability to the corresponding requirements of clinical medicine, among which are clear recognition of all of the disorders that may affect a dentist's procedures, or which may be influenced by them. Dental practice obviously includes both the opportunity and the obligation to detect oral symptoms of abnormalities within the related domains of dermatology, laryngology, ophthalmology, otology, and rhinology, common pathological states in other parts of the body, and certain systemic maladies; to give advisory health service in dietetics, sanitation, and prevention of diseases; and to consult intelligently and effectually with a physician in a patient's behalf.

In view of the obvious importance of this phase of dental practice one notes with surprise that the Dental Educational Council's curriculum (Table 3), which specifies acceptable minima, reserves only 48 hours for subjects that correlate clinical dentistry with clinical medicine. The allowances of these hours to such important matters as physical diagnosis and principles of medicine (16), principles of surgery (16), and anesthesia (16), are plainly disproportionate, although a degree of correlation is attained in the teaching of various aspects of clinical dentistry. The contrast in the Council's reservations between 48 hours for clinical medicine and 960 hours for elementary dental mechanics is impressive.

Dental service in hospitals and dispensaries has been developing, but as yet is generally deficient. Few dental schools maintain useful relationships with hospitals and, as a rule, dental students receive very little clinical instruction outside of the dental infirmaries. A closer union between hospitals and dental schools would facilitate expansion of the dental service in hospitals, and would also improve the instruction of the dental students in oral medicine. The need for dental internes in hospitals is apparent.

d. Clinical dentistry

Approximately 40 per cent of the Dental Educational Council's curriculum (Table 3) is devoted to clinical dentistry. Of the allotted total of 1808 hours, 1424 are reserved for clinical practice, and the remainder (384), for the consideration of special relationships, are divided among dental pathology and dental therapeutics (96), exodontia (16), operative dentistry (96), oral hygiene (32), oral surgery (32), orthodontia (32), prosthetic dentistry (64), and roentgenology (16). Every dental school has an infirmary, which is the analogue of the hospital and dispensary in medical education. Direct chair-side treatment of patients, under conditions closely similar in all significant respects to those of private practice, has been a fundamental procedure in dental education since the establishment of the first dental infirmary in the Baltimore College of Dental Surgery in 1846. During the era of commercialism in dental schools the purpose of proprietors to obtain large

financial profits from infirmary fees, and the imperative need of the students for practical experience in reparative and restorative dentistry, met on this common ground, to the great advantage of the prospective practitioner. In a large majority of the dental schools at present the clinical instruction is sincere, intensive, and the most effectual in the curriculum. Its chief faults are inadequate application of the medical sciences and deficient correlation with clinical medicine, as already noted. The infirmary presents an exceptional opportunity to the earnest dental student to teach himself clinical dentistry as he understands its scope, and to overcome to some degree the many handicaps arising in poor schools from inadequate presentation of the principles of physics and mechanics, insufficient education in esthetics, poor preparation in the medical sciences, and indifferent instruction in the relationships between medicine and dentistry.

The dental school, by bringing the student into intimate association with the patient relatively early in the curriculum, facilitates a much closer integration of the courses than the faculties have fully realized, and presents conditions that should encourage development of the most stimulating instruction. A varied chair-side experience during the last two years in an extended clinical service enables the student to attain a high grade of proficiency. In the best schools he acquires a readiness to begin a dependable practice *by the time he graduates* that is rarely achieved to the same degree by the medical undergraduate, unless a prolonged supplementary hospital training is included in his preparation. In these important respects dental education is notably superior to medical education.

e. Graduate work

The scope, complexity, and difficulties that arise from the concurrent mechanical, esthetic, and medical demands upon dentistry make it impossible for any one to practise expertly all aspects of it, and several important specialties have arisen as a consequence. Oral surgery and orthodontia have acquired the status of accredited dental specialties, but oral diagnosis, periodontia, and prosthodontia are among the phases that now seem to be attaining concreteness and gaining an increasing number of whole-time representatives. The schools of dentistry, like those of medicine, have not yet attempted seriously the task of training specialists in dental practice or in dental teaching or research, and with a few exceptions provide only undergraduate curricula. In view of the practical bent of dentistry it is strange that graduate work has never made an important appeal to dental teachers in the university schools, and that its urgency did not hasten the elevation of the undergraduate curriculum to an academic college foundation. This anomaly becomes all the more apparent when, reflecting on the obvious need for an adequate system of education for the specialties of dental practice and for dental teaching and research, one considers the impossibility of providing it in an undergraduate curriculum, and notes the fact that, lacking suitable opportunity in the dental schools, *bona fide*

specialists in dentistry, as in medicine, have obtained their training chiefly through apprenticeship or by self-instruction.

The first graduate courses in dentistry were offered at Michigan in 1894, where, for nearly twenty-five years, the graduate degree was D.D.Sc., but since 1918 has been M.S. Similar opportunities, though for the M.S. degree alone, have been offered by Minnesota since 1915-16, Illinois since 1921-22, Northwestern since 1922-23, and Marquette since 1924-25. The total attendance of graduate students in dentistry at these five universities during the past four academic years (1921-25) was successively 2, 8, 18, and 26, with the corresponding averages of 1, 2, 4, and 5, or one in 444, 216, 135, and 129, respectively, of the total number of graduates from all of the dental schools in the United States during the next preceding years. The maximum annual attendance during the past three years was registered at Northwestern, with 4, 9, and 14 students, respectively. None of the candidates has received the Ph.D. degree. The most recent additions to graduate curricula in dentistry are those offered at Marquette, where the dental school, on a

TABLE 7

GRADUATE CURRICULA AT MARQUETTE: ORGANIZED IN 1924-25
(Each extends through 1200 clock hours and 32 semester hours)

<i>Courses</i>	<i>Clock Hours</i>	<i>Semester Hours</i>	<i>Curriculum 1 Oral Surgery</i>	<i>Curriculum 2 Ortho- dontics</i>	<i>Curriculum 3 Prosthodontics</i>	<i>Curriculum 4 Preventive Dentistry</i>
Anatomy: head and neck	432	10	Required			
Anesthesia	64	1	Required			
Embryology	108	3	Required			
Histology	135	4	Required			
Neurology	108	4	Required			
Oral surgery: major and minor	209	3	Required			
Radiology	64	1	Required			
Surgical pathology and principles of surgery	80	1	Required			
Thesis	...	4	Required	Required	Required	Required
Bacteriology and sero-immunology	164	4		Required	Required	Required
Embryology	50	1		Required	Required	Required
Histo-pathology	210	4		Required	Required	Required
Orthodontics	300	7		Required		
Pathology: general and special	90	2		Required	Required	Required
Physiology and dietetics	306	8		Required	Required	Required
Prosthodontia	80	2		Required		
Occlusion: principles and mechanics	128	4			Required	
Orthodontics	32	1			Required	
Prosthetic restorations	220	4			Required	
Clinical microscopy: theory	54	2				Required
Clinical microscopy: practice	128	2				Required
Dental pathology	142	3				Required
Preventive dentistry	106	3				Required

high-school foundation until 1925-26, now requires two years of work in an academic college for admission, the undergraduate curriculum is being reorganized for the intensive training of general practitioners only and reduced in length to three years, and specialties will be taught in graduate curricula such as those indicated in Table 7, on page 139.

f. Special curricula and courses

In harmony with the recent growth of dentistry, and with the multiplication and improvement of its procedures, there is a widespread and commendable desire among dental practitioners for additional training, but the dental schools have not seriously attempted to provide it. The undesirable consequences of this neglect, which are indicated in a general way on pages 71 and 72, will continue to embarrass dentistry until the dental schools meet it effectually.

Curricula for the education of dental hygienists, advanced courses for the further training of general practitioners, courses for dental assistants and technicians, or dental extension teaching, or all of these, were conducted during 1924-25 by the schools named in Table 8. The importance of the auxiliary practice of oral hygiene, the need for the development of curricula for dental hygienists, and the urgency of better training for technicians, are discussed in Chapter IV.

TABLE 8

DENTAL SCHOOLS IN WHICH GRADUATE WORK AND SPECIAL COURSES WERE CONDUCTED IN 1924-25¹

<i>School</i>	<i>Graduate courses</i>	<i>Curriculum for dental hygienists</i>	<i>Courses for dental practitioners</i>	<i>Courses for dental assistants or technicians</i>	<i>Dental extension teaching</i>
California	-	+	-	-	+
Columbia	-	+	-	-	+
Harvard	-	-	+	-	-
Illinois	+	-	+	-	-
Iowa	-	-	+	-	+
Loyola (Chicago)	-	-	+	-	-
Marquette	+	+	+	-	+
Michigan	+	+	-	-	-
Minnesota	+	+	+	-	+
Nebraska	-	-	-	+	-
New York	-	-	+	-	-
North Pacific	-	-	-	+	-
Northwestern	+	+	+	+	+
Pennsylvania	-	+	+	-	-
Pittsburgh	-	-	+	-	-
Temple	-	+	-	-	-
Tufts (Forsyth)	-	+	+	-	-
Virginia	-	-	-	-	+
Washington	-	-	+	-	-
Total (+)	5	9	12	3	7

¹The Rochester Dental Dispensary has been conducting a school for dental hygienists since 1916-17.

D. GENERAL QUALITY OF THE TEACHING OF DENTISTRY AND THE STATUS OF THE TEACHERS

The general educational quality of many of the dental schools in this country, only three of which remain proprietary, is relatively inferior. Some of the least satisfactory are university schools, which, despite their academic relationships, have been conducted in the commercial spirit of proprietary schools. The observed educational infirmities are due in large degree to inadequacy of financial support ; low academic standards of admission ; conspicuous indifference to the requirements of good teaching ; serious shortage of capable teachers ; prevalent use of teaching titles as inducements to underpaid part-time practitioners to accept the advertising values of such school relationships in private practice in lieu of salaries, and the consequent deficiency in the number of devoted officers ; hostility to the legitimate claims of dental education in the universities from most of the medical authorities ; absence of the spirit of research and of the aspiration to scholarship in general ; and lack of vision of the high professional quality of dentistry as a means of health service.

Most of the teachers, having been selected without reference to teaching experience and having only a casual interest in their duties as instructors, make no particular effort to improve their ability and rarely seek instruction in a teacher's college. That teaching is a profession for which adequate training is desirable does not seem to be recognized by dental faculties. The dental school should be a clearing house for the best in dental practice, and in it the student should come into close association with some of the leading practitioners in the community, who, even though they may give only occasional service, are needed to contribute to the best development of the clinical instruction, to inspire the students to their most ardent efforts, to stimulate the interest of the whole faculty, and to quicken progress in all aspects of the work. But the active practitioners should not be expected to exercise leadership in the consideration of the educational problems of a school, which, as a rule, only a faculty containing a number of trained and experienced teachers can solve wisely and progressively. At present, most of the teachers of dental subjects are young and inexperienced practitioners, who serve only temporarily or incidentally, but, as the salaries are inadequate and the standing of dental teaching is relatively low, there is little to encourage them to look forward with confidence to a life of contented usefulness in whole-time positions in dental schools. These unfortunate conditions will probably continue until, in leading universities, the salaries of the teachers of dental subjects are made commensurate with the importance and value of good teaching and research in the dental schools ; until fellowships are established to help dental teachers to engage in special studies of education ; and until adequate opportunities for systematic advanced work in dentistry, with eminent teachers and investigators, are

created. It is regrettable that the universities most competent to promote these objects have done nothing important to advance them.

At the foundation of the inferior educational quality of many dental schools are also the assumptions that the dean must be a dentist above everything else; that he should be free to engage largely in the private practice of dentistry; that he may ignore his duties or have them performed by subordinates as much or as often as the paramount requirements of his private affairs suggest; and that experience in administrative work and training in education are the last and the least of the qualifications he should possess. The prevailing misapprehension in universities regarding the opportunities and needs of dental education, and the failures of universities to provide more generously for its development, are directly traceable to the lack of educational understanding, vision, and initiative among the deans of most of the university dental schools.

The training of men and women to practise dentistry is primarily a process of education, and the leadership in dental schools should be notably educational. A good dental faculty, selected on the basis of sound criteria of qualification, should always be able individually or collectively to solve the teaching problems that are peculiar to dentistry. It is neither necessary nor desirable for a practitioner of dentistry in the office of the dean to dictate any of this. The ideal executives of a dental school would be a dean who, although a dentist, had been trained broadly in the science and art of education, and an associate dean having similar training and capacity. But whether a dentist or not, the dean should be able persuasively to represent the cause of dental education in the councils of the university; to guide his colleagues in the proper accommodation of the school's educational difficulties; and to lead the faculty in the onerous task of making and keeping the school highly effectual not only as a teaching organization, but also as an agency for the promotion of scholarship and the advancement of research, a medium for important community health service, and a centre of professional inspiration.

CHAPTER VIII

EQUIPMENT AND FINANCIAL SUPPORT OF DENTAL SCHOOLS

A. EQUIPMENT

a. *Early conditions*

RELIABLE records of the physical status of dental schools during the first sixty years of their history are too fragmentary to reveal the extent of the equipment during that period. Conventional statements in annual announcements, to the effect that the facilities were complete and up-to-date, usually left everything to the reader's imagination. In a general way the development of buildings and equipment for dental schools has paralleled that for medical schools. Gradually from the very meagre accommodations at the beginning, consisting usually of one or two lecture rooms and a private retreat for the dissection of human cadavers, there have evolved the facilities of the modern university dental school of the best type, including ample technical and clinical means both for attention to the subjects and conditions peculiar to dentistry, and for laboratory instruction in the related arts and sciences. Before 1893 there had been little or no general interest in the problems of equipment and no concerted effort among the schools to improve it. Instruction by lectures predominated to such an extent that very little seemed to be needed in a material way except the infirmary. In 1896, three years after the establishment of the National School of [Association for] Dental Technics, which gave a strong impetus to considerations of equipment, a committee of the National Association of Dental Faculties stated, in a general report on the physical status of thirty-five of the forty-eight dental schools then in the United States, that they were "well provided with lecture rooms and in most instances ample laboratory and dispensary accommodations with sufficient and appropriate appliances." The committee regarded these conditions not only as a "broadening" of the curriculum, but also as evidence that "fuller courses" were given "in all departments," several schools having "recently added [didactic] courses in bacteriology and extended their work in histology and pathology in practical ways." This report, which omitted details, did not include a reference to twelve schools that were not represented in the Association, and appears to have been accepted solely as a matter of information, for there is no indication in the *Proceedings* that any definite minimum requirements in equipment had been considered or were projected. The model curriculum adopted three years later (page 119) suggests that several standards of equipment had been gradually acquiring definiteness informally, a view that is supported by the Association's decision, in 1900, to admit to advanced standing in the senior classes of its member schools only such dentists, from foreign countries,

as had been graduated from dental schools that met the following six minimum requirements affecting equipment in a total of ten criteria that were specified :

“(1) The college must possess a *bacteriological laboratory*, with sufficient equipment for instruction in a competent course in bacteriology, which must form a part of its curriculum of study. (2) The same must be required in *chemistry, histology, and pathology*. [The curriculum approved in 1899 did not indicate these laboratory requirements in bacteriology and pathology for American schools.] (3) There must be a *technic laboratory* in which shall be taught the proper manipulation for the insertion of all kinds of fillings for teeth, the preparation and filling of the roots of teeth, the tempering and shaping of instruments, the drawing of wire and tubing for cases in orthodontia, and the cutting of bolts and nuts. (4) There must be *prosthetic laboratories* sufficiently equipped for teaching all kinds of prosthetic work, and the construction of all the approved prosthetic appliances. (5) There must be a sufficiently equipped laboratory for instruction in making *crowns and bridges*, and the construction of appliances used in *orthodontia*. (6) There must be a properly equipped *infirmary* or surgery for the reception of patients, upon whom each and every student shall be required individually to perform all and enough of the operations necessary in dental practice thoroughly to qualify him for the successful pursuance of his profession.” (Italic not in the original.)

Although these published requirements were specified for foreign schools only, they suggested the Association's opinion of the minimum requirements in general equipment for an acceptable dental school in the United States. They remained a general guide until 1916, when the Dental Educational Council, in its first published folder on Minimum Requirements for Class A Dental Schools, included these indications of essential items of equipment: An *anatomical laboratory*, with at least one cadaver for every six students. One *chemical laboratory* equipped adequately for general inorganic, organic, qualitative, quantitative, and physiological chemistry. One *histological laboratory*, with high power microscopes sufficient in number to give each student the working use of one. A suitable number of *classrooms*, with a projection lantern in at least one of them. *Technic laboratories* capacious enough to provide an individual table for each student. An *infirmary* equipped with chairs equal in number to the membership of the senior class, with an adequate x-ray outfit, and practical facilities for the sterilization of the instruments used by the students. A *library* with at least twice as many volumes as students enrolled in the school, and constantly accessible.¹ “The value of the building and equipment (grounds excluded) must be equal to at least \$300 for every student enrolled . . . and the school must have . . . equipment for at least 100 students.” The infirmary must afford opportunity for each student to conduct at least 150 operations in fillings, prosthetic work, and orthodontia, additional to preparatory treatments and extractions.

¹Despite the requirement of laboratories in bacteriology and pathology for schools accredited in foreign countries by the National Association of Dental Faculties in 1900, as stated above, these standards of equipment for a Class A school in the United States do not specify laboratories in either bacteriology or pathology, nor do they include laboratories of physiology and pharmacology.

b. Recent developments

The Dental Educational Council's latest statement of its minimum requirements in equipment, issued in 1922, includes, besides standards of capacity, illumination, and sanitation of rooms and buildings, these specifications relating to essentials of equipment for its Class A rating: (1) Adequate number and quality of microscopes, instruments, models, charts, teaching specimens, projection lanterns, lathes, ovens, vulcanizers, and other teaching apparatus, materials, and accessories. (2) Of the equipment commonly used by students, an amount sufficient to provide for the work of individuals or small groups. (3) In the anatomical laboratory, at least one cadaver for eight students, whether at work simultaneously or not. (4) The equipment of the infirmary, and the number and character of the patients subjected to treatment, such as to afford, for each student, adequate instruction in the various operations of dentistry. (5) In the infirmary an efficient system of sterilization, and an adequate x-ray outfit, both readily accessible. (6) A library of modern textbooks and reference books on dentistry and allied subjects, including files and current numbers of dental and other scientific journals, properly indexed; situated in a room adequate in size, equipment, and accessibility to invite its continual use by students and teachers; and in charge of an "attendant."¹

Since 1923, in harmony with the standards implied as well as expressed in the foregoing requirements, and through the use of a system of rating that includes similar criteria, the Council has emphasized the importance of certain kinds of objective facilities in terms of rooms, furniture, working equipment, and teaching accessories, for the academic and medical sciences, dental technology, and clinical dentistry, but none for dental esthetics, the oral correlations with clinical medicine, research, or graduate work. In 1924-25 the general equipment of the dental schools in the United States ranged, in regard to quality and degree of completeness, from that of the proprietary Texas Dental College, situated in several small rented rooms in a commercial block, to such buildings as the commodious and distinctive one of the Thomas W. Evans Museum and Dental Institute, at the University of Pennsylvania. Twenty-nine schools conduct infirmaries in their main buildings; and of the fourteen without buildings for their own exclusive use, eight share facilities with medical schools and four with other schools than medical; one school conducts its technical and clinical work in rented rooms near a university; and one, without any academic association, occupies a few rented rooms. A classification of the schools into these groups is shown in Table 1, on page 146.

In 1924-25 the estimated value of the land and buildings used primarily for dental education by the forty-three schools in the United States was \$6,105,137, an average of \$141,980 for each school.² The equipment was valued at \$3,042,371, an average of \$70,753.

¹ See the footnote on page 144, which applies also to these specifications. Anatomy is the only medical science directly mentioned in the recent requirements relating to equipment.

² This does not include rented property, or buildings of which the larger portions are used by medical schools. See the Appendix (Table 1, last four columns).

There was a total debt of \$1,707,807, an average of \$39,716. The total net value of the property was \$7,439,701, an average of \$173,016. The total floor area devoted mainly to dental instruction averaged 34,910 sq. ft., which is closely equivalent to that of eleven rooms 30 ft. by 100 ft. in size. The corresponding figures for the Canadian schools are given on page 219.

A majority of the schools are well equipped for the work in dental technology and in clinical dentistry (page 137). During 1924-25, in twenty-three schools, all or nearly all of the medical sciences were taught with the coöperation of medical faculties, and, as a rule, in laboratories where medical students received similar instruction. Few of the schools have adequate facilities for the study of the correlations between clinical medicine and clinical dentistry, although some maintain useful clinical relationships with hospitals and dispensaries. In most of the schools the libraries are notably inadequate.

TABLE I

CLASSIFICATION OF THE DENTAL SCHOOLS IN THE UNITED STATES
WITH REFERENCE TO GENERAL EQUIPMENT: 1924-25

I. SCHOOLS WHICH HAVE THE EXCLUSIVE USE, PRACTICALLY, OF AT LEAST ONE BUILDING (29)

Atlanta ¹	Denver	Kansas City ²	* Minnesota	San Francisco ²
* Baylor	* Harvard	* Louisville	New York ³	So. California
* Buffalo	* Howard	Loyola (Chicago)	* Ohio (Cin.)	* Vanderbilt
Cincinnati ¹	* Illinois	Marquette	* Pennsylvania	* Washington
* Columbia	Indiana ³	* Meharry ⁴	Pittsburgh	* Western Reserve
Creighton	* Iowa	* Michigan	* St. Louis	

II. SCHOOLS WHICH DO NOT HAVE THE EXCLUSIVE USE OF A BUILDING (14)

A. *Occupancy shared with a medical school (8)*

* Georgetown	* Ohio State (Col.)	* Tennessee	* Tulane
Maryland	Temple	* Tufts	* Virginia ⁴

B. *Occupancy shared with a school or schools other than medical (4)*

California	Loyola (New Orleans)	North Pacific ⁴	Northwestern
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C. *Clinical work done in rented rooms near the university*

Nebraska

D. *Occupies a few rented rooms*

Texas^{1,5}

The equipment commonly used by dental students in their technical and clinical work is very similar to that in the office and laboratory of a dental practitioner. Although as

* In 1924-25, most or all of the medical sciences were taught with the coöperation of the medical school. This statement applies to twenty-three dental schools.

¹ Independent and proprietary, of which there are three.

² Independent and non-proprietary, of which there are two.

³ United with the university at the close of 1924-25, of which there were two.

⁴ One of two or more associated professional schools, of which groups there are three, although North Pacific College of Oregon is primarily a dental school.

⁵ Now occupies a new building (1925-26).

a rule all of the massive articles that may be employed in common are supplied by the school, the student is required to purchase most of the things he needs, which, as his personal property, may be useful in his future practice. Inasmuch as the units in this private outfit are numerous and valuable, and their utility is easily impaired, the selection, care, replacement, and cost of these instruments and materials are matters of particular concern to the student. Much of this minor equipment is often sold to the student under conditions that are directly imposed upon him by the school, and in some cases appears to be made excessive for mercenary reasons. A number of schools act as direct intermediaries in the sale of equipment to students, or encourage the students to conduct a co-operative plan, in order to ensure the use of approved articles at reasonable rates. Representatives of other schools, considering this function a commercial opportunity, either sell goods to students at prices intended to afford a "good profit," or to that end, openly or privately, effect personal arrangements with supply houses.

c. Undesirable relationships of supply houses

Thirteen schools, most of them integral parts of universities and four in state universities, reserve rooms in their buildings for retail stores conducted independently by one or more supply houses for the direct sale of dental merchandise to students. This is done "for the convenience of all concerned," but, because the salesmen are not always men of high personal character, and their example and influence are not in harmony with the ideals of a profession, some of these stores breed personal selfishness and commercial overreaching among the students. Thus, in institutions where a true professional spirit should be inculcated above everything else, the outlook of both teachers and students is beclouded by mercenary influences. The location of such independent stores in the buildings of dental schools is unnecessary, undignified, and unprofessional. Instead of venders of dental merchandise being required to sell their wares in the market-place, the supply house is welcomed into the dental school building as a closely coöperative agency. At home and at ease as an important and accredited part of the local educational system, it is given, by such frankly intimate association, a degree of public standing and participation that appears to carry with it, for the house and for "business in dentistry," an avowedly professional benediction. Under such circumstances, purposes of material acquisition, which utilitarian education unavoidably nourishes in the student, are overstimulated by the insignia of associated commercialism, when such aims should be persuasively and consistently repressed by refining restraints that minimize selfishness and encourage professional aspiration.

Dental manufacturers and supply houses have been remarkably successful in the production and distribution of invaluable merchandise, and the advanced practice of

modern dentistry would be impossible without a continual abundance of the best products of the dental industries. Too much cannot be said in commendation of the enterprise that has developed this solid foundation for the material evolution of oral health-service. Dental business, having been effectually organized, is competent to continue and to develop this important public service, which alone is more than sufficient to tax its greatest ingenuity and all of its integrity, and which assures honorable profits and contentment.¹ Unfortunately, however, dental business essays to be rather the mentor of dentistry than its faithful and effective assistant, and presumes continually to advise and to guide the profession. The relatively weak resistance of dentistry to commercial cajolery, as evidenced in the results that are being continually obtained among dentists by producers and distributors of supplies, has encouraged dental manufacturers and supply houses persistently to intrude selfish influences into almost every phase of dental affairs, long after medicine has developed a complete intolerance for such trade impositions. No other profession appears to respond so spontaneously to infantile advertising. Some men of influence in dental education are active agents of dental business, not always frankly but none the less effectually, and they will probably continue to retard the growth of altruism in dentistry so long as they are given places of trust and responsibility in the profession. Dental education should be completely freed not only from proprietary management, which is openly personal, but also from that type of selfishness which, far more damaging to the professional spirit of dentistry, manifests itself insidiously on behalf of dental business through confidential relationships in avowedly professional organizations. The advancement of dentistry in the public interest requires the complete ascendancy of the spirit of service over all commercial considerations without exception.

B. FINANCIAL SUPPORT

a. *Proprietary era*

The financial management of hospitals and dispensaries is usually separate from that of medical schools; but, since the establishment in 1846 of the first dental infirmary as an integral part of the Baltimore College of Dental Surgery, dental schools have had their own out-patient departments or infirmaries, which, because of low costs of equipment and service, usually have been maintained and operated at a profit. The two main sources of revenue for the support of most dental schools are tuition fees paid by students, and service fees paid by patients. Most of the treatment in the dental infirmaries, for which the patients pay definite fees, is given in all of the schools by the junior and senior students as a required part of their clinical training, and, under the supervision of teachers, is per-

¹In the United States during 1925, dental goods, exclusive of instruments and machinery, were made to the value of \$38,769,049, including \$5,947,729 for artificial teeth. These dental products were made by 326 manufacturing establishments, which paid \$6,131,699 in wages to 5303 (average monthly) wage-earners, not including salaried employees. (Preliminary report of Census of Manufactures in 1925: U. S. Department of Commerce.)

formed for the schools without remuneration of the students. On this plan the greater the number of students in attendance, the longer the line of patients receivable in the infirmary for treatment by students, and the smaller the salaries for instruction, the larger the ensuing net income. Under private ownership of dental schools, the financial returns from these two sources, and the profits to the proprietors, have usually been heavy. Such a school, conducted at a large annual profit, recently paid a single dividend equal to two-thirds of the par value of its outstanding stock.

For many years the instruction in dental schools consisted almost entirely of lectures, laboratory work in dental mechanics, and infirmary practice. Under these conditions, the cost of equipment and teaching having been very low, the managers of the business of dental education reaped their richest financial harvests, and dental schools multiplied to their maximum number. Most of the dental schools long resisted the demand for laboratory work in the medical sciences, chiefly because in proprietary schools the addition of such instruction threatened to consume the profits by greatly increasing the cost of equipment and teaching. When the demand for laboratory work in the academic and medical sciences became strong enough to require formal attention, practical courses were instituted in most of the dental schools, but they were usually conducted superficially and ineffectively. In some instances, although the courses were publicly announced as parts of the curriculum, they were never given. Even now, because of inadequate equipment and ineffectual teaching, the few remaining independent dental schools, and most of those in universities that are expected or required to be self-supporting, are notably deficient in their attention to the academic and medical sciences. Experience has demonstrated that a dental school in which there is due attention to all of the laboratory subjects, adequate instruction in clinical dentistry and in its correlations with clinical medicine, proper remuneration for all of the teachers, reasonable activity in research, and commensurate equipment, is like an acceptable medical school in being unable to support itself on the income from fees.

b. Recent conditions

The total amounts of the funds directly appropriated in universities during the past five years, for the use of dental schools in excess of their current income from fees, are shown in Table 2, on page 150.

That a dental school cannot be at the same time a commendable educational institution and a successful money-making organization having been demonstrated, the transformation of dental schools from the status of private ownership to membership in universities has assumed cumulative force and urgency during the past few years, and only five of the forty-four schools in this country remain independent, of which three are proprietary

(1925-26). Of these five independent dental schools, all but one seek union with universities, and only one remains proprietary by choice. Universities represent the best type of public agency for the promotion of advanced education in all of its branches, and, since their management as a rule is competent and altruistic, they are trusted to promote the public welfare rather than the private or personal interests of individuals or corporations. Accordingly, universities receive and can suitably invite gifts and endowments for such specific purposes as the furtherance of dental education, and for the support of all of the

TABLE 2

DATA INDICATING THAT APPROXIMATELY HALF THE NUMBER OF UNIVERSITY DENTAL SCHOOLS IN THE UNITED STATES REQUIRED AND OBTAINED *CURRENT* INCOME IN EXCESS OF THE COMBINED AMOUNTS OF TUITION AND SERVICE FEES PAID BY STUDENTS AND INFIRMARY PATIENTS: 1920-25¹

	1920-21	1921-22	1922-23	1923-24	1924-25
Total amount of direct appropriations by universities to dental schools, in excess of tuition and infirmary fees, and of all other <i>current</i> income	\$195,512	\$254,976	\$294,266	\$350,078	\$512,016
Average amount of the appropriations	9,776	16,998	17,310	20,593	26,948
Number of schools to which these appropriations were made ²	20	15	17	17	19
Number of university schools which were conducted without a deficit, or at a profit, on the <i>current</i> income from fees ³	14	19	17	19	17

TABLE 3

AMOUNTS OF CURRENT INCOME FROM ENDOWMENT AVAILABLE TO THE DENTAL SCHOOLS OF THE UNITED STATES: 1920-25⁴

School	Current income from endowment				
	1920-21	1921-22	1922-23	1923-24	1924-25
California	None	None	None	\$549	\$589
Columbia	\$6,000	\$6,000	\$6,000	6,550	6,550
Harvard	10,420	8,528	9,255	9,218	9,500
Northwestern	None	None	66	66	610
Pennsylvania	25,000	35,000	34,800	38,664	34,952
Pittsburgh	100	150	150	300	200
Total	<u>\$41,520</u>	<u>\$49,678</u>	<u>\$50,271</u>	<u>\$55,347</u>	<u>\$52,401</u>
Number of schools having current income from endowment	4	4	5	6	6
Number of schools having no current income from endowment ⁴	42	42	41	37	37
Total number of dental schools	46	46	46	43	43

¹ This includes the dental schools in the two groups of associated non-proprietary professional schools during the first three years (Meharry, Virginia), and the three since the latter part of the fourth year (Meharry, North Pacific, Virginia). See page 146.

² Of the schools that received this additional income, those that did not exact a higher entrance requirement than graduation from a high school numbered 19, 6, 9, 7, and 6, respectively.

³ Of the schools that did not receive direct appropriations from universities, those in which the minimum entrance requirement was graduation from a high school numbered 25, 23, 18, 15, and 13, respectively.

⁴ Several endowment funds now in process of development from profits are not indicated here because they have not yet been productive of current income.

functions universities perform for the benefit of the public. Independent professional schools, if proprietary, cannot for obvious reasons expect to obtain endowments; and, if non-proprietary, rarely receive gifts of funds because the public senses the scholastic disability that arises from lack of academic associations, and knows that such schools cannot be so useful as they would be if they were parts of universities. These facts indicate why, all other things being equal, there will be cumulative advantage to dentistry from the incorporation of all of the dental schools into universities. But, if a university requires a dental

TABLE 4

DATA SHOWING THE GENERAL FINANCIAL CONDITION OF THE DENTAL SCHOOLS IN THE UNITED STATES: 1920-25¹

	1920-21	1921-22	1922-23	1923-24	1924-25
Current income	\$4,285,528	\$4,971,140	\$5,618,420	\$5,781,931	\$5,810,045
Current expenditures	4,144,418	4,761,729	5,329,151	5,458,560	5,558,472
Surplus	\$141,110	\$209,411	\$289,269	\$323,371	\$251,573
Excess of expenditures over dental income in the university schools, and included in the above total for current income (see Part VI and the Appendix) ²	787,925	930,887	908,636	953,237	721,535
General net deficit	646,815	721,476	619,367	629,866	469,962
Average net deficit per school	14,061	15,684	13,464	14,648	10,929

TABLE 5

DATA SHOWING THE RELATION BETWEEN ATTENDANCE AND INCOME FROM FEES AT THE DENTAL SCHOOLS IN THE UNITED STATES: 1920-25

	1920-21	1921-22	1922-23	1923-24	1924-25
I. A. Current income from fees:					
Tuition fees (students)	\$2,392,437	\$2,664,796	\$2,928,685	\$2,937,660	\$2,858,602
Infirmary fees (patients)	912,739	1,109,823	1,503,213	1,622,656	1,538,394
Total	\$3,305,176	\$3,774,619	\$4,431,898	\$4,560,316	\$4,396,996
B. Income compared with that for 1920-21, expressed in percentages:					
Tuition fees (students)	100	111	122	123	119
Infirmary fees (patients)	100	122	165	178	169
II. A. Attendance:					
Students, at the end of the year	11,745	12,369	13,099	12,355	11,863
Patients treated in the infirmaries	262,595	306,467	381,928	424,780	411,452
B. Attendance compared with that for 1920-21, expressed in percentages:					
Students	100	105	112	105	101
Patients	100	117	145	162	157

¹See also the general financial data on pages 145-146.

²These totals include very liberal estimates of the value of the indirect benefits derived by most of the schools from their membership in universities. The corresponding total amounts of the actual appropriations to the schools, by the universities, are shown in Table 2.

school to be self-supporting, or deliberately uses it in a mercenary manner to provide resources for other departments, the school's membership in that university may fail to be helpful to the work of the dental faculty.

Generous financial support of the best dental schools, for the promotion of the public welfare through individual and community health-service, is an important social necessity. That the universities have failed almost completely to impress upon the public the urgency of this need is shown by the data in Table 3, which presents the names of the six dental schools having current income from endowments during the past five years, the amounts of such income, and related information. In 1924-25, the average amount of current income from endowment for the six schools named in the Table was \$8734; for the forty-three schools in the United States, it was \$1219.¹ No other statement in the present Bulletin, regarding dental schools, indicates more directly than this the reasons for the present deficiencies in dental education.

The financial condition of the dental schools individually, during 1920-24, may be noted from the data in Part VI. The tables in the Appendix present financial items for 1924-25, in an arrangement intended to facilitate direct comparisons. The general financial situation in dental education in the United States for five consecutive years is indicated by the data in Table 4, on page 151.

In some of the schools it has been found desirable to increase various fees, in order to meet current expenses; in others, to swell the profits for a number of reasons including anticipated payments into university treasuries. The general conditions in this relation, for the schools collectively, may be estimated from the data in Table 5, on page 151.

c. Need for endowments

Dental education needs and deserves specific endowments. It will be unable to attain its normal development until it enjoys a full share of the many advantages that now accrue to the students, teachers, investigators, and practitioners of other types of scientific health-service. Without a relatively large income in excess of fees, salaries for instruction cannot be made sufficient to attract able men to the career of teaching in dentistry, constructive experimentation in dental education will be sporadic and superficial, and in most schools the instruction will remain perfunctory and uninspiring. Deprived of financial support analogous to that given to medical education, research will continue to languish, libraries cannot be materially strengthened, equipment will not be improved, methods will lack scientific scrutiny, desirable development of instruction for both medical and dental students in the correlations between clinical medicine and clinical dentistry will be impossible, and coöperation between medicine and dentistry will not acquire the cor-

¹ Some of the dental schools in state universities, which receive allotments of annual legislative appropriations, have the equivalent of current income from endowment.

diality and sufficiency that should characterize it. The recent gifts by Mr. George Eastman, the General Education Board, and the Rockefeller Foundation to the University of Rochester (page 463), and of Mrs. Montgomery Ward to Northwestern University (page 331), amounting in each instance to millions for the promotion of education, research, and service in medicine and dentistry coordinately, signify a high appreciation of the public importance of dental education.

The financial needs of the dental schools are indicated in some detail in Tables 1, 2, 3, and 4 of the Appendix, where Table 7 also presents, for each school in 1924-25, typical data relating to the average amounts of the tuition fees and of the expenditures per student.

CHAPTER IX

RESEARCH

A. GENERAL IMPORT FOR DENTISTRY

SYSTEMATIC endeavor to extend the boundaries of knowledge is the mainspring of science, and the register of a profession's standing and achievement. Without the stimulating influence of recurrent discoveries in a profession, ignorance, discouragement, inefficiency, and stagnation impair the usefulness of those who seek to exemplify its best service. With research in active progress, however, and its findings freely disseminated, there is comprehension, enthusiasm, effectiveness, and growth in those who devote themselves to the duties of a responsible calling. Research in its greatest successes attains the highest flights of imagination, but its influence may also permeate the events of every-day experience, for the practitioner of dentistry who makes the most complete and accurate diagnosis in a given instance is guided by the spirit of enquiry to the discovery of truth in a particular relationship. The practice of health service in any branch, unless animated by research, is weakened by the complacency of empiricism. The most useful practitioners are revealed by the light of the former, incompetents and quacks are protected by the shadows of the latter.

The fruits of enquiry are essential foods for the proper nourishment and full growth of a profession, but, as in the nutrition of the human body, there must be a balanced ration for normal development. Thus far, investigation in dentistry has been one-sided, for, in the main, it has consisted of the development of profitable patented inventions, chiefly under commercial auspices. This research, which has been mechanical almost exclusively and biological only incidentally, has been directed toward immediate and obvious remedial needs. Although it has been very desirable and useful in the attainment of these important objectives, reparation rather than prevention has been its primary concern. In the fundamental duty of endeavoring seriously to discover means of obviating the development of dental and oral abnormalities, dentistry seems to have been waiting for such agencies to arise spontaneously; has learned and applied very little; and with notable exceptions has been so well satisfied to meet, remedially, conditions as they are in the individual, to-day, that the profession in general is failing to acquire the knowledge that might give it power, by prevention, to serve all humanity to-morrow. In this relation, as in all others, problems cannot be solved without understanding, attention, imagination, and effort. If complete prevention of any dental or oral deficiency is unattainable at present, dental teachers should be able to ascertain that such is the case and why. But, if any or all such defects can be obviated, investigators in the dental schools should endeavor to learn how. The finest flowering of dental education, by its elucidation of scientific principles and by the instillation of altruistic purposes in the most gifted

students, will be discoveries of means for the general prevention of dental and oral diseases. A system of dental education that fails to make this ideal an abiding aspiration of its teachers, and the goal of its students, misses its greatest possibilities of usefulness.

B. RESEARCH AT DENTAL SCHOOLS AND MEDICAL SCHOOLS CONTRASTED

One of the most striking contrasts between medical schools and dental schools, viewed collectively, is the vigorous activity in research in the former and the weak interest in original investigation in the latter. Most of the medical schools display keen and lively effort to discover the nature of the conditions, factors, and influences that maintain health, or that induce deficiency, or that afford the most effectual means to control or to cure disease; and the teachers maintain an aggressive and ardent endeavor to formulate the problems of medical science and art, and to solve them. The dental schools show high appreciation of new appliances, implements, and operative procedures; give alert attention to the invention of better instruments; and manifest active interest in devices of value in dental practice. But, with a few notable exceptions, the teachers have very hazy conceptions of the biological problems of dental science and of the pathological criteria of oral health-service, and exhibit little inclination or ability to open new paths to the undiscovered truths of either. In medical schools during the past fifteen years, coincident with increasing endowments, the interest in research has grown so strong, and its rewards in professional distinction have become so great and beguiling, that individual teachers in increasing numbers are shirking the duties of instruction on the pretext that the prospective importance of their investigations justifies disregard of the immediate needs of their students. In dental schools, on the other hand, there is no imminent danger of any impairment of the quality of the instruction because of undue absorption in research.

In part, these impressive differences between medical and dental schools have grown from the more generous financial support accorded to medicine and from the more active interest of the universities in medical education. But, in large degree, they have also developed from other influences, among which are the higher plane of general education upon which medical teaching has been adjusted, the greater appreciation among medical teachers of all of the sciences upon which modern health service is based, the broader view in the medical schools of the application of the related sciences (to all parts of the body except the mouth), and the clearer vision of the future needs and opportunities of medicine. The reasons for the contrast become clearer, and some of the measures for the improvement of research in dental schools become more evident, when it is considered, further, that many of the teachers of medical sciences and of clinical medicine in universities, who occupy positions of commanding influence and cooperate with dental faculties more or less unwillingly, underrate both the importance of dentistry and its intellectual quality as shown by its present low academic standards. Not only have these medical teachers been

indifferent to the problems of oral health and dental practice, but, owing to traditional prejudice or to ignorance, they have also continually disparaged dental research as devoid of systemic significance.

C. SPECIAL CONDITIONS THAT INTERFERE WITH RESEARCH IN DENTAL SCHOOLS

Of the two general groups of teachers in dental schools, those who give instruction in the dental subjects are usually more interested in private practice than in teaching or in research. Often, without the advantages of an inspiring preliminary education, their understanding of the applications of the related sciences is slight, their outlook is restricted chiefly to proficiency in superficial reparative manipulation, and they have neither inclination nor ability to conduct or guide original investigation. The teachers of the medical sciences in university dental schools could promote dental research if they would, but, in accord with the prevailing inattention in universities to dental education, most of these instructors have seemingly not yet learned that, although normal teeth are living parts of the body, abnormal teeth may endanger the life of the individual. These teachers as a group, despite their more advanced education, their broader views of the application of the medical sciences, and their clearer vision of the ideals of health service, have been unconcerned about the obvious importance of its oral aspects. They have failed to include the teeth within the scope of their interest in research, and have not been inspired by the dental practitioners among their colleagues to give dental problems attention. Both groups of teachers in most schools, collectively as faculties, being inactive in dental research and indifferent to it, fail to evoke the spirit of enquiry among their students, who are not taught to understand anything intimately, but rather to acquire facility in empirical work of direct visible utility. The dental mind has not been encouraged to go very far behind the scenes or into fundamentals, has been too "practical" to deal effectually with the unseen, and has focused attention on the immediate and the tangible. As dental practitioners have not been educated to apprehend clearly or to think constructively of their daily biological experiences, the imaginations of many stop at the abutments of bridges or at the tips of the roots of teeth, and successful repairs and effective restorations satisfy their professional purposes.

Lack of interest in biological research in dental schools and among dental practitioners has been directly dependent upon disregard for the medical sciences, which even now are tolerated rather than taught in some schools. Instruction in these subjects is often poor because the teachers are either indifferent when drafted from the medical staff, or incompetent when recruited from other sources. The students naturally imagine they ought to know "something" of these fundamental subjects; but many, observing that their clinical teachers have little or no acquaintance with the medical sciences, or fail to apply

them in "practical dentistry," promptly conclude that "such knowledge is merely a fad," and soon acquire the "typical clinical indifference to the theoretical subjects." As a consequence, students project their future needs along mechanical lines almost exclusively, and lose opportunity to acquire broad biological comprehension. After graduation, practising empirically, they rarely have either the inclination or the capacity to turn their observations to good account in studies of means to prevent disease.

These unfavorable conditions are hardly susceptible of much improvement while the public and the universities withhold adequate financial support, or the teachers of the medical sciences ignore dental problems, or the teachers of the dental subjects perform their duties perfunctorily, or the dental students lack the preliminary education that is required to make a large number of them responsive to the intellectual appeals of research. Dental education cannot attain its greatest helpfulness for the individual student where the teachers lack the inspiration of the ideals of research; where the instruction fails to stimulate growth of its spirit in the students; and where the duties of practice are not shown to be obligations both of special enquiry and of direct response to the truth in the findings, for each patient in every instance of treatment, prescription, or advice. The chief responsibility of a dental school is the training of relatively large numbers of general practitioners of dentistry; but it should also encourage and support research by its teachers, and should arouse and develop creative capacity and professional leadership among its most gifted students. Inspired men of unusual ability, critical judgment, and distinguished service will arise most frequently among the graduates of dental schools that are animated by the spirit of research.

D. GENERAL PROGRESS IN DENTAL RESEARCH

a. Success in reparation

The development of the practice of dentistry has been proceeding steadily, step by step, on a remarkable succession of discoveries, inventions, devices, and procedures. Nearly all of them have been mechanical in nature and reparative in import, but the greatest, the boon of general inhalation anesthesia, was biochemical in character and fell within the scope of the medical sciences. The evolution of ways and means of treatment in the routine practice of dentistry has carried the art to an extraordinary degree of perfection and efficiency in remedial relief for the individual patient. It would be impossible to exaggerate the benefits to humanity that have been derived, and will continue cumulatively to arise, from the ingenuity of the long line of contributors of important dental methods and utilities for the alleviation of suffering and the removal of disability. The wholesale manufacture and sale of most of these additions to the dental armamentarium has required the development of a great industry and heavy monetary investments. Collectively, the leading dental manufacturers and supply houses have been performing

a signal public service by putting these articles on the market, and also by assuming the financial risks involved in their production in the superior quality, and in their distribution in the large quantities, now required by nearly 70,000 practitioners in this country alone (page 148). The maintenance of a high degree of excellence in dental products through efforts continually to improve them, and by research to substitute or refine them, is a responsibility which is so important and exacting, and so certain to receive its just rewards in remuneration and appreciation, that the self-respecting dental manufacturer or owner of a worthy dental supply-house will stick to his last, if he reads aright the signs of the times, and not impair the esteem in which he may be deservedly held for honorable industrial usefulness by intruding commercial influences where only professional considerations should appear.

b. Failure in prevention

Unfortunately, the extraordinary development of mechanical agencies for relief and reparation in dental practice has not been matched by commensurate progress in the prevention of dental and oral abnormalities, a phase of dentistry in which very little has been discovered or achieved. The tendency to irregular alignment in dentition appears to be growing; decay of teeth is rampant; loosening of teeth owing to disease of the closely investing tissues was never more common; conditions of disease at the roots of teeth are as numerous as ever; systemic sequelae of infection through dental channels have been noted in increasing incidence and variety; defective teeth are being extracted by the millions; and oral maladies involving both teeth and jaws, and requiring surgical attention, have not perceptibly decreased. Dentistry has been triumphant in the art of repair, but has been baffled by the mysteries of prevention. By the use of adequate physical means in the mechanical tasks that long were regarded as its chief obligations, dentistry has attained a remarkable degree of success. Confronted, however, by the modern duty to understand pathological causes and to remove or control them, dentistry, lacking the requisite medical comprehension, is rendering deficient health service; and medicine, by an indifference for which no one attempts a justification, has failed to direct the resources of medical research to the task of disinterested cooperation in the treatment and prevention of dental disorders.

c. Special agencies for the promotion of dental research

1. Journal and association

Although few of the dental schools have been active in original investigation, and the dental profession has not yet attained notable success in preventing oral ailments, an increasing number of the most enlightened dentists, appreciating the duty and opportunity to apply biological principles as effectually as mechanical methods for the maintenance

of dental and oral health, have been promoting special agencies for the advancement of research in dentistry. The *Journal of Dental Research*, established in New York City in 1919, in accordance with the best traditions of disinterested professional journalism, is a quarterly, which, rejecting advertisements as a means of support and therefore having no obligations to increase the sale of industrial products, aims to promote research in all phases of dentistry by affording exceptional advantages for well-illustrated and non-commercial publication. The International Association for Dental Research, founded in New York City in 1920 — a federation of sections in New York, Boston, Chicago, Toronto, Ann Arbor, and San Francisco — holds local and general meetings, and is gradually attaining significance as an organization for the stimulation of dental research and for the encouragement of the teachers and practitioners who directly engage in original investigation.

2. *Scientific Foundation and Research Commission of the American Dental Association*

(a) Establishment and achievements

In 1913, under the leadership of Dr. Weston A. Price, one of the first to apply roentgenography to the diagnosis of oral disorders, the American Dental Association created a Scientific Foundation and Research Commission. In 1915, at Cleveland, Ohio, the Commission established an incorporated Institute for Dental Research that was intended to resemble the Rockefeller Institute for Medical Research. Originally, the funds for this important purpose were contributed by dentists individually, on five-year pledges of personal subscriptions or through state societies to the amount of one or more dollars per member of the total payment of annual dues. Lately, the financial support has been obtained, in the main, by apportionment of the annual dues of the members of the Association. The original contributions were used directly for the advancement of research, but, for the purchase of property, the Association raised an additional fund, which was secured chiefly from laymen, dentists, and dental societies. The expectation that special gifts for an endowment would be obtainable has not been realized. Research under the auspices of the Commission was begun in 1913, chiefly on grants to individual workers in university laboratories. In 1916, under the directorship of Dr. Price, it was extended to the Institute's own laboratories, which were housed in a separate building with a staff of whole-time and part-time workers. From the beginning, however, numerous conflicts of purpose and policy as well as of responsibility and authority, and consequent confusion and discord, so severely embarrassed the work of the Institute that, in 1920, at the Director's suggestion, the Institute was discontinued, the equipment sold, the land and building leased for other purposes for a period of ninety-nine years, and the direct and annual income thus derived turned over to the Commission. As a standing committee of the Association, the Commission has continued, without domicile, to promote research by the annual award of grants to individual investigators. Although the Institute could not be

TABLE I
EXPENDITURES FOR RESEARCH UNDER THE AUSPICES OF THE SCIENTIFIC FOUNDATION AND
RESEARCH COMMISSION OF THE AMERICAN DENTAL ASSOCIATION: 1920-25¹

(Compiled from published records. Verified by the Secretary of the Commission)

	1920-21	1921-22	1922-23	1923-24	1924-25	Total
T. B. Hartzell, ² College of Medicine, University of Minnesota	\$3,627	\$2,984	\$3,955	\$3,659	\$3,700	\$17,925
P. R. Howe, Forsyth Dental Infirmary and Harvard Medical School	750	1,527	2,943	3,077	4,000	12,297
G. S. Millberry, ¹ College of Dentistry, University of California	500	900	2,077	2,000	2,000	7,477
W. H. G. Logan, Chicago College of Dental Surgery	... ³	900	2,375	25 ⁴	...	3,300
A. D. Black, Dental School, Northwestern University	...	1,200	2,200	2,200	2,400	8,000
A. D. Black, Dental Index Bureau	...	2,853	3,362	2,795	1,992	11,002
Henry C. Ferris, New York City	...	1,000	1,000	150 ⁵	...	2,150
M. L. Ward, R. W. Bunting, and U. G. Rickert, ¹ College of Dental Surgery, University of Michigan	...	...	1,800	1,800	1,800	5,400
H. B. Tileston, School of Dentistry, University of Louisville	...	...	1,125	1,500	1,500	4,125
E. H. Bruening and C. E. Woodbury, College of Dentistry, Creighton University	...	...⁶	... ⁶	417	300	717
F. O. Hetrick, for the West Texas Dental Society	...	...	...	89	1,000	1,089
F. V. Simonton, College of Dentistry, University of California	...	...	...	1,500	1,425	2,925
F. O. Hetrick, for the Nebraska State Hospital	...	...	...	...⁷	500	500
Total amount of the expenditures	\$4,877	\$11,364	\$20,837	\$19,212	\$20,617	\$76,907
Number of individuals to whom payments were made	6	15	24	25	20	...

¹ The funds appropriated for the support of the researches at the University of California and at the University of Michigan were paid to the fiscal representatives of the universities and by them transferred to the corresponding collaborators. In all other instances payments were made directly to the collaborators by the Secretary-Treasurer of the Commission upon proper detailed requisition from the advisers, each of whom is named in this table. See footnote 2. *Unused grants:* (a) \$900, to W. A. Grey, University of Minnesota Hospital, in 1921-22, for a statistical study of the ratio of focal infections to other diseased conditions; (b) \$600 to the United States Bureau of Standards, in 1924-25, for a study of physical properties of materials used in dental practice; (c) also those mentioned in footnotes 4, 5, 6, and 7.

² The names of individuals as advisers were used by the Commission to differentiate the grants, but in no case did an adviser receive remuneration. He served solely as an unpaid adviser of collaborators to whom the funds were paid and who conducted the researches in the institutions specified. See footnote 1.

³ The mark, . . . , indicates no grant.

⁴ Because suitable collaboration could not be obtained, there was no research at the Chicago College of Dental Surgery, under the allotted grant of \$2400 for a study of problems pertaining to the treatment of pulpless teeth. The small indicated expenditure represents a delayed payment on the account for 1922-23.

⁵ There was no research by Dr. Ferris on the allotted grant of \$1000 for a study of the relation of the composition of the saliva to systemic disease, because he was unable to obtain the help of a technician. The small indicated expenditure represents a delayed payment on the account for 1922-23.

⁶ Grants of \$1000 each, for studies of the comparative histology of teeth and bone, were not used.

⁷ A misunderstanding prevented the use of a grant of \$500 for a study of nervous disorders due to dental or oral conditions.

continued, Dr. Price's devoted work in founding and endeavoring to maintain it resulted not only in the research accomplished through the agency of the Institute but also in the creation of the Weston A. Price Fund, which, from the lease of the Institute's property, will yield approximately \$11,000 annually for the promotion of research, beginning in 1928 (page 33). In addition — and, measured in terms of ultimate good, most important — the dental profession was awakened to an understanding of the need for research, and the Association induced to give it direct support.

The data in Table I indicate the various amounts that have been expended annually during 1920–25 from definite grants by the Commission. The nature of the researches conducted under the auspices of the Commission and the names of the investigators have been indicated in detail in the published annual reports of the Secretary of the Commission. The data for 1923–24 were presented in the issue of the *Journal of the American Dental Association* for May, 1925 (xii, p. 575). Additional data regarding the fund for research are given in the Appendix.

(b) Weaknesses of the Commission in conception and purposes

Research in dentistry is so urgently needed, the purpose to promote it is so commendable, and the spirit of self-help is so worthy, that certain infirmities of the American Dental Association's plan to support research, largely on apportionments from the annual dues of its members, cannot be pointed out without regret; but it is believed that these weaknesses should be frankly indicated in the interest of greater progress in dental research itself. Several of these deficiencies made it impossible for the Association to continue its Research Institute, while some of the ensuing influences threaten to misspend the funds now available and to demoralize the movement in support of dental research.

The Commission, all of whose twenty-five members serve without remuneration and are plainly animated by the most commendable motives, has done more than any other agency to arouse interest in research among dental practitioners, and continues to quicken the spirit of enquiry in the American Dental Association. Unfortunately, very few members of the Association comprehend the difficulties and uncertainties that beset original investigation, and, having no real fondness for the privilege of paying annual dues on an ascending scale of taxation, they very naturally "expect something for the money" that is apportioned for the support of investigations. Failing to realize that "results" of research cannot be produced like dental supplies — by machinery — and that much of the ablest and most earnest effort may be wholly negative in its outcome, the members of the Association doubt the desirability of expenditures of their dues that do not yield early assurances of practical value. The numerous members of the Research Commission, who vote the grants, are designated by appointment with tactful regard for geographical distribution and honorary distinctions, in the belief that interest in research can be

stimulated among the practitioners in this political way. The members are usually selected for reasons other than demonstrated understanding of the peculiarities and limitations of research, or appreciation of the methods by which important additions to knowledge can be made, or expert comprehension of ways and means to particular scientific ends or of most advantageous routes thereto. As representatives of variable moods at annual meetings of the Association, the members of the Commission are in the predicament of congressmen in the consideration of an appropriation bill, when matters of general importance may be subordinated to the exigencies of local considerations. Instead of giving strong support to several studies of questions of outstanding importance, the total amount of available funds is divided into weak fractions to assist in maintaining researches that are often short in range and superficial in import. Funds have been awarded to advisers who have had no training in research, and have shown little ability to conduct it or to guide others through it; and there is a growing tendency to accept flamboyant inventories of titles and abstracts of fragmentary reports as evidence of profundity and advance rather than of superficiality and confusion. The Commission's grants weaken the sense of obligation of dental schools individually to endeavor to obtain important endowments of their own for research, and some of the grants have had the indirect effect of reducing the load of salaries for instruction in dental school budgets. The Commission does nothing to solve one of the most pressing problems—the discovery of young men and women who are exceptionally qualified and disposed to devote their lives to dental teaching and research. It does not conduct a critical study of the progress of dental research, nor recurrently report the findings of a sustained enquiry of this kind for the information of the public and for the guidance and stimulation of dental students, teachers, and investigators. It does not formulate and publish reasons, from time to time, why funds in large amounts are urgently needed for the promotion of the public welfare through masterly studies of such important problems in dental practice as the status of the pulpless tooth and its proper treatment. The Commission is without a whole-time officer to execute its views; to coördinate the researches it supports, so far as that may profitably be done; to conceive and promote progressive policies; and to represent it persuasively before the profession and the public.

(c) Suggested change of plan

If, under the general guidance of a whole-time member, the Commission's resources, present and to be obtained, were concentrated on the solution of a fundamental problem, or if individual grants under the present plan were conditioned on the availability of funds in equal or larger amounts from other sources for the same purposes, the work of the Commission would certainly be more fruitful in discovery of principles and more satisfactory to the many individual contributors to its funds. It is probable, however, that, without an annual income large enough for the liberal support of intensive research on the

solution of main problems, the resources of the Association could be used to far greater advantage in the study of some of the many professional matters which the universities may not be inclined to investigate, but which are important immediate questions in the daily routine work of the practitioner, such as the qualities that the most useful type of dentifrice should have and why.

Interest in oral hygiene is extending in every direction and the use of dentifrices is rapidly increasing, but the public looks in vain to the organized dental profession for authoritative guidance and protection in the selection of dentifrices; and, in bewilderment, follows the lead of the most persuasive and often the least truthful advertisements. "The dentifrice problem," cited merely as an example of many important predicaments of practice, is growing acute as many different products, having dissimilar powers and representing conflicting purposes, are being widely advertised in terms of contradiction, exaggeration, or absurdity, not only in lay publications but also in dental journals, which, although professedly conducted in "the interest of the profession," sell their pages for the deception of dentists and their patients. Indifference to this situation prevails among dentists chiefly from lack of understanding of its import, but it also exists despite the fact that the findings, if any, on which the claims for some dentifrices are based may be secret or unconfirmed, unreliable or fraudulent, and the dentifrices themselves damaging to the health of the teeth or oral tissues. Such practices of exploitation, common in newspapers and supply-house organs, reflect a financial policy that is frankly self-interested. But it is difficult to account for the fact that the American Dental Association, as an organization, which should be alert to represent faithfully the professional ideals of dentistry, engages in this kind of commercialism. In return for liberal sums of money for advertisements in its official monthly *Journal*, the Association helps to sell dentifrices regarding the oral healthfulness of which its agents have no reliable assurance, and on which it conducts no searching enquiry. By so doing the Association participates actively for pay in the encouragement of dental quackery and in the promotion of empirical dentistry among confiding honorable practitioners, who are thus induced to use or recommend goods exploited with the help and approval of the Association they trust. Expenditure of portions of the annual dues of the members in behalf of investigations conducted for their guidance and support as practitioners would seem to be a much more desirable plan than disbursements of these funds, as in the recent past, for the promotion of research on such interesting though remotely academic problems as the histology of the teeth and shell of the claw of the lobster, or on the question why the bullfrog has teeth and the American toad has none. Investigations such as these, which have no apparent immediate value, but which if done thoroughly might lead to discoveries of fundamental importance, could be financed to far greater public advantage from funds available in the universities for the advancement of research without reference to utilitarian considerations.

The Commission would perform a useful public service if, formally expressing the

conviction that all dental schools should be engaged in research and should endeavor to obtain the necessary funds, it also announced that, after 1928-29, independent grants in support of research would be awarded to officers of dental schools under exceptional circumstances only. The Association would be wise to discontinue its attempt to do what the universities should undertake without assistance from the dues paid to the Association by its members. The universities are now awakening to their responsibilities in dental education, and, since one of their paramount duties in this relation is the direct promotion of dental research, they will certainly proceed with it. If the Association, through its Commission, conducted a continuous study of the progress and most urgent needs of dental research, and frequently published statements of both for public and professional guidance, it would encourage and stimulate coordinated work in the universities. If the Association also gave increasing support to penetrating and dependable research into the validity of the advertised claims for the many industrial articles offered to the individual practitioner and now used empirically by him, and thus steadily acquired new working information of direct practical helpfulness to all dentists and their patients, it would perform a function similar in public importance to the very useful service of the Council on Pharmacy and Chemistry of the American Medical Association.

Wherever this proposal has been discussed it has been suggested, by some, that research of this kind, by threatening to destroy certain kinds of undesirable business, would array the commercial interests unitedly against it and that the present grip of the manufacturers on the machinery of the Association is strong enough to prevent the creation of anything so protective of dentistry as the Council on Pharmacy and Chemistry of the American Medical Association has been of medicine. It is certain, however, that, when the rank and file of the membership of the American Dental Association fully realize the import of the fact that the Association has not been seriously attempting to solve the problems of most immediate importance for the practitioner, but, instead, has been trying to do what the universities should conduct without the Association's financial assistance, new leadership will arise, against the commercialism that may now block the way, to promote the kind of research that would give reliably to dentists the information and guidance they urgently need in the selection and use of much that is offered for sale to them and to their patients.

E. SOME URGENT PROBLEMS FOR INVESTIGATION IN DENTAL SCHOOLS

a. Need for sustained interest in procedures of treatment

The importance of mechanics and esthetics, and of their applications, is considered in some detail on pages 128-133. Until the knowledge of the causes of dental diseases becomes clear and certain, and the prevention of all dental disorders is attainable and

actually achieved, the technical procedures of amelioration, reparation, and beautification will remain the chief means of urgent oral health-service. Therefore, the bio-technical expedients of dentistry, although they have long received the closest attention and have been farthest advanced, should be given continual study, and their progressive improvement made an abiding responsibility of dental schools. Methods of examination, diagnosis, and treatment, and the attendant technical procedures in relation to known conditions, automatically impress their demands for betterment. But, to become available to the larger proportion of the public that now is unable to pay for good reparative dental service, these means, subjected to intensive research, should be made simpler and more direct, brought well within the capabilities of the average general practitioner, and applied with materials and by processes of lowest permissible costs. The need for sustained interest in the improvement of all phases of treatment is so obvious and so widely understood, however, that attention in this section, relating particularly to research in dental schools, may be more profitably directed to a few of the many biological aspects of oral health-service about which dentistry has been less concerned, and which, theoretically more fundamental and holding the keys to the possibilities of the control and prevention of the chief oral maladies, not only do not appeal to the self-interest of patentees or producers but require large financial gifts for their disinterested study.

b. Essential biological considerations

The types of dental research that could be undertaken to the greatest advantage in university dental schools are those that, relating to the deepest problems of dentistry, require the highest degree of scholarship, the most complete understanding of the fundamental sciences, the widest latitude of choice of experimental ways and means, the broadest freedom of application and of direction of approach, and the fullest measure of altruistic devotion; and which, conducted with abundant collaborative resources in associated laboratories, could be promoted under the least exacting extraneous expectations as to the rate of progress and the nature of the outcome. Given these favorable conditions, and financial support such as that which investigators in the medical schools enjoy, members of dental faculties, trained and competent to conduct research, could reasonably be expected to make steady progress in the solution of the major problems in the science and art of oral health-service.

For the prospective erection of a system of preventive control of oral abnormalities, which is the main purpose of the most profound dental research, certain unique facts provide an immovable foundation. The main body of a fully-formed tooth, in harmony with the morphological requirements of its functions to transmit heavy pressure as well as to resist compression therefrom, is an exceptionally dense biological mass and also a particularly stable structure. The hard parts of a human tooth, containing neither blood

vessels nor more than a few active cells, if any, have the mechanical quality of deposited matter rather than the dynamic character of cellular structure. Therefore, movement of contained substances being very slight in amount, and occurring chiefly by diffusion rather than selectively by cellular nutrition, these parts are notable for the very small degrees of chemical activity and reaction that occur within them, as compared with some of the bones and all of the soft tissues of the body. Consequently, the teeth, being markedly passive chemically, are relatively defenseless, have very limited powers of self-repair or regeneration, and are unable to remove imperfections in the structure, or to mend breaks in the continuity, of the protective coat of enamel. For the same reasons, they cannot effectually resist or remedy bacterial disintegration of the enamel or of any portion of dentin that may be exposed through defects in the enamel, nor prevent the passage of microorganisms along such channels into the central dental pulp. A tooth, after its full development, appears to be beyond the possibility of important improvement in physiological efficiency by any process of nutritional invigoration, although the dentinal protection of the pulp may be increased somewhat by special activity of the pulp itself, and useful change by impregnation of substances from the pulp and from the oral fluids is a possibility. Functional use does not enlarge fully-formed teeth, or thicken their opposing enamel coats, or give them individually greater mechanical utility. On the contrary, it involves attrition, which, despite defensive formation of new dentin from within, becomes cumulative with gradual net loss of dental substance. But perfectly formed teeth in healthy bodies may withstand all of the ordinary wear and tear to which they are subjected, and remain functional indefinitely and free from physiological deficiency, without any hygienic attention or operative treatment for their general preservation.

The inability of teeth to repair defects in the enamel, and the common occurrence of imperfections in this protective covering, especially of the molars, are conditions that justify the removal of deficient portions of the enamel and their artificial replacement by adequate filling procedures very soon after the eruption of a tooth, *before decay can begin or, gaining headway, can spread to adjacent perfect tissue*. Prompt acceptance of the theoretical inevitable in this undesirable initial condition when it occurs, which usually involves the sacrifice of only a very small portion of the superficial tissue that otherwise would soon be lost by decay, enables the alert dentist to prevent the passage of caries through this imperfect enamel, and thus to protect the health and prolong the usefulness of the tooth for many years ("prophylactic odontotomy"). For children having defective enamel—and few escape—the practical importance of this procedure of "cutting the tooth" for the prompt prevention of caries or of the extension of initial decay cannot be overestimated.

The striking facts that a tooth cannot remove defects in the structure of its enamel, or repair breaks in the continuity of this protective coat, or actively defend itself against

invasion by microorganisms, and yet under ordinary conditions of use and regardless of oral hygiene, if perfectly formed, may remain healthy and functional for a lifetime, suggest that the secrets of general prevention of dental abnormality are hidden in the constructive processes of normal dentition rather than in the conditions of superficial oral hygiene, however valuable the latter may be as supplementary means for the protection of the teeth by the removal of extrinsic hostile agents or of destructive influences. On the other hand, although a tooth that is perfect to begin with may remain healthy indefinitely, unless of course it is grossly injured, certain important facts suggest that inimical conditions within the body or in the oral environment of the teeth, or both, may induce disease of a perfect tooth, even after many years of freedom from noticeable defects or deficiencies. The one group of conditions suggests that, for fully formed teeth, ordinary hygienic procedures may be futile as preventive measures; the other emphasizes their importance in delaying the incidence of dental ailments. More appropriate enquiry than any heretofore instituted may be expected to reveal all of the facts, and to afford a reliable basis for true prevention. Problems of research relating to dentition and to oral hygiene are among those noted in the succeeding sections; and to infection of the roots of teeth, on pages 230-231.

c. Various influences on the processes of normal dentition

In a consideration of the problems of normal production of the teeth and of prevention of dental defects, a pivotal truth is the fact that the foundations for the permanent dentition are laid during embryonic development. Discoveries of the essential conditions for the perfect prenatal growth of the teeth and jaws, and adjacent parts, promise to reveal primary means for preventive control of oral abnormalities, and also to provide a new general basis for effective enquiry into practically every biological question of dental and oral interest. Comprehensive study of the problems of normal dentition, in a determination of physiological means for the prevention of dental and oral deficiencies, would necessarily include thorough research into these wide channels, among many others, relating especially to formation, eruption, alignment, and occlusion; to the protective enamel; and to the tissues that hold the teeth in place:¹

- (a) The types of dental and oral abnormalities that are directly influenced by heredity.
- (b) The correlations between a child's dentition and the physiological status of the parents at the time of conception, and for preceding periods of various lengths.
- (c) The influences, on a child's teeth, of the physiological condition and environmental relationships of the mother throughout pregnancy and during the period of lactation.
- (d) The dietary and closely environmental conditions, during infancy, childhood, and

¹ The problems of research suggested in this subsection, and in those that follow, are presented as illustrations only, not as comprehensive plans of research in any relation. The suggestions are intended to show the scope and urgency of dental research, to focus interest on its promotion, and to indicate clearly the need for liberal financial support of efforts to advance it in the dental schools.

adolescence, that are best adapted for the maintenance of physiological growth of the body in general and of normal dentition in particular.

(e) The character and interrelationships of the processes of nervous and chemical coordination in the body that influence dentition, and of the conditions that disturb these adjustments, in embryo, infancy, childhood, and adolescence, especially.

(f) The relation of social and economic factors to general health and dentition, from infancy to maturity.

(g) The nature of transient conditions, such as habits, which, with or without effect on normal general growth and health, may influence dentition.

(h) The effects of common diseases on dentition.

Despite the fundamental nature of these problems and of others that are similar in general import, and the greater preventive control their solution might afford, organized dentistry has failed to subject them to systematic study. Beyond a few fragments of knowledge in each relation, little of importance has been reliably established. It is obvious that prevention of the oral abnormalities that arise later in life is also a matter of great importance (page 170), but the extent to which, in the middle-aged or senile, the manifestations of abnormality in the tissues that surround the teeth are due to preventable deficiencies in the original development of these tissues has never been determined.

d. Destructive factors in the oral environment

1. Enamel

When the destructive influences that may be exerted upon teeth by systemic conditions or the immediate oral environment, or both, are considered, one finds a similar situation of uncertainty requiring intensive research. Thus, in a consideration of superficial influences in the mouth that tend to bring about decay of teeth and which may be directly affected by measures of oral hygiene, six conditions are particularly important:

(1) Although dental enamel is hard and dense, some of its ingredients react chemically with various substances that may be secreted, produced, or taken into the mouth. Such reactions may remove these constituents from the enamel, which, as a consequence, may be damaged by superficial solution, penetration, or disintegration.

(2) Normally, many kinds of microorganisms are continually present on all oral tissues, in all oral fluids, and on all exposed surfaces of teeth. They could not be wholly removed at any time by any method, but multiply rapidly under quiescent conditions, and produce a variety of substances that tend to react chemically and destructively on the constituents of the enamel.

(3) Various substances in many types of food, such as sugars in candy, pastry, adhesive desserts, and the like, are fermentable by oral bacteria into acidic products that may attack the enamel.

(4) When for any reason fermentable material lodges at a particular position on a tooth or between teeth, molecules of destructive fermentation products are directed in a steady procession against the tooth or teeth at that point as often as convertible material appears and as long as it remains.

(5) Recurrent lodgment of fermentable material at a given location, day by day for a long period, may gradually result in acidic and bacterial penetration of the enamel at that point, with consequent exposure of the underlying dentin, and automatic putrefactive tunneling thereafter by microorganisms, which, once admitted, may multiply with increased rapidity on the additional food derived from the dentin.

(6) Such decay occurs at separate positions, not on the surfaces of teeth generally or symmetrically, and, in its initiation and development in a tooth, is a sharply localized process.

Considered sequentially, these factors of direct dental decay are presumably operative through the recurrent lodgment at a given position of solid or liquid masses of food and other debris that are there fermented by bacteria, the resultant acidic products of fermentation, continually renewed, slowly penetrating the enamel at these points, and, if the process is sufficiently prolonged, producing channels along which bacteria advance into and through the dentin and thence to the pulp.

That dentistry has not found a satisfactory way to prevent these destructive developments is indicated by the fact that conventional measures of oral hygiene do not seem to do more than delay the onset or retard the rate of progress of dental decay. Intensive investigation of primary factors in this situation, especially in correlation with researches of the type indicated in the preceding subsection (page 167), to afford preventive control, should include comprehensive enquiry into such conditions as the following:

(a) The exact elementary composition and the mineralogical constitution of the inorganic matter in enamel, with particular reference to variations in the resistance to chemical change.

(b) The structural relationships between the mineral and non-mineral constituents of enamel, especially at the surface, with special regard for the admissibility of microorganisms along definite channels.

(c) The nature of the substances in saliva, both in health and in disease, and under different conditions of secretion and nutrition, which directly or indirectly modify the enamel, physically or chemically.

(d) The possibility of inducing protective superficial impregnation of enamel with physiological substances or other agents.

(e) The probability that saliva contains substances which inhibit or stimulate the action of decay-inducing organisms, and that variation in the distribution of saliva over the dental surfaces causes fluctuation in this influence.

(f) The reasons for the fact that in many mouths in which the teeth are never brushed, but are notably unclean from adherent debris, there is little or no decay.

(g) The influence of deposits of salivary mucin, if any, on the initiation of dental decay.

(h) The conditions of the teeth and mouth that particularly favor the undesirable lodgment or deposition of food, salivary constituents, and bacteria on dental surfaces.

(i) The kinds of acceptable food which, either in chemical character, or by requiring vigorous mastication rub the teeth physiologically to the greatest advantage, are the most efficient in preventing depositions on teeth.

(j) The forms of food that yield the most destructive substances in their fermentation by the most active of the decay-producing organisms.

(k) Conditions that determine the most abundant growth of the microorganisms, and the production of the damaging substances by them, at the initiation of decay in different locations.

(l) The character and peculiarities of the most destructive type or types of microorganisms that are involved in the initiation of decay, and the chemical nature of their most damaging products.

(m) The histological quality of the "enamel cuticle" (Nasmyth's membrane), and its relation to the normal protection of the enamel against the action of microorganisms.

(n) The influence, on dental decay, of secretions from the oral, nasal, and pharyngeal tissues.

(o) The perfection of mechanical means for the ready and efficient application of dentifrices to all dental surfaces.

There has been much trifling with questions that are included within the scope of these basic problems, but dentistry has not given them serious attention, despite the universal recommendation to prevent decay by keeping teeth clean, and freely using toothbrushes, dentifrices, and dental floss or tape to do so. Everybody knows that neither bristles nor dentifrices ordinarily pass between teeth which fit tightly against one another and which may undergo decay at their surfaces of contact; that bristles may not enter the crevices, fissures, and pits which occur in many teeth; and that dental floss or tape cannot be effectually applied by the layman. Fortunately these means of attaining oral cleanliness, the most practical now available for popular use, serve to delay the incidence of dental disorders, or to retard their progress, and, pending the development of more satisfactory agencies, should be improved.

2. *Periodontal tissues*

Diseases of the tissues that surround and support the teeth are as common at middle age as caries in youth, and, like decay, they tend to induce not only total loss of teeth but also serious local and systemic disturbances. Their causes being incompletely understood

and their prevention not yet wholly attainable, research directed at their control is one of the outstanding obligations of dentistry.

Dentists who have had long and intimate clinical experience with the periodontal disorders note these generalizations regarding them:

(1) Dental caries is absent from many mouths in which there is periodontal disease and *vice versa*, indicating a dissimilarity of important influences in the development of these ailments.

(2) Local agencies are usually dominant in the causation of periodontal maladies.

(3) In many cases, however, systemic forces seem to be primarily responsible for the occurrence of periodontal disorders.

(4) Hereditary influences appear to be factors in the development of many cases of periodontal disturbance.

(5) The "enamel cuticle," where it connects with the gum surface, may be a protection against admission of microorganisms between them.

(6) Human teeth may undergo "continuous eruption" throughout life, although very slowly and at variable rates.

(7) The gums tend constantly though variably to recede toward the apex of the root.

(8) Thus far studies of nutrition, in animals, have failed to produce periodontal lesions that are similar, in essential respects, to those of the disease.

(9) A disturbing agency called "traumatic occlusion," which is stated to be essentially an excessive pressure on certain teeth when the jaws are brought together, is regarded as a cause of periodontal lesions in some cases and of lesions of the dental pulp in others. It has even been claimed that this factor may determine the incidence of enamel decay.

Power to prevent disease obviously arises from complete understanding of the normal as well as of the pathological, yet the physiology of the teeth and their associated structures has been seriously neglected, and the study of dental problems has proceeded almost entirely from the standpoint of the pathologist. Dentistry, absorbed in the obvious elements of periodontal disease, has focused its practice on such matters as the removal of deposits of tartar, of mucin plaques, and of other extraneous irritants, and has advised patients that periodontal disease can be prevented by keeping the teeth clean, notwithstanding the fact that this disorder frequently develops in mouths that have been receiving scrupulous care in this respect. Over-emphasis on cleanliness of the teeth as the basis of oral health has tended to prevent appreciation of its deeper biological foundations. Oral hygiene has given relief, but it is only a short step toward prevention. Dentistry has made gratifying progress in the treatment of mature cases of periodontal disease, but prevention awaits the outcome of research. Complete investigation of periodontal disease should include attention to many procedures and objectives, such as these:

(a) Comprehensive histological examination of the diseased tissues, correlated with close observations of the clinical conditions.

(b) Determination of the histological state of teeth and their supporting structures in cases of periodontal disease that have been successfully treated.

(c) Histological examinations analogous to those in (b), but applied to cases treated without result, or with incomplete success, (1) by each of the conventional methods, such as dietary regulation, removal of calculus (tartar), relief of "traumatic occlusion," etc., and (2) by new methods that the results might suggest.

(d) Chemical analysis of the fluids of the mouth as a whole, and of those that are exuded at and near the gum margin.

(e) Observations of the dynamics of tooth function, with special reference to effects (1) on the local circulation, and on the growth (2) of alveolar bone and (3) of cementum.

(f) Studies of hereditary relationships to determine the reasons for (1) the observed resistance to periodontal disease in some individuals, and (2) the susceptibility thereto that is commonly observed in mouths which are relatively immune to caries.

(g) Development, in animals, of methods to produce lesions that would be typical of human periodontal disease, for its experimental study.

(h) Enquiry into the nature of the systemic conditions, in health and disease, that may initiate or affect the development of periodontal disorder.

(i) Thorough study of the "enamel cuticle" where it is attached to the gum, with special reference (1) to its protective relationships and (2) to the possibility that its perfect production might be facilitated.

(j) Consideration of means, if any, to retard or halt (1) recession of the gums, and (2) "continuous eruption" of the teeth.

(k) Effort to ascertain the full import of "traumatic occlusion" as a cause of periodontal disease, or as an effect, or both.

(l) Improvement of methods for the personal care of the mouth, to delay or prevent the incidence of periodontal disease, so far as purely local procedures can accomplish either result in any case.

A comprehensive study of the causes and treatment of periodontal disease, supported for a period of five years by a grant of \$85,000 from the Carnegie Corporation, and by at least \$20,000 from other sources, has been in progress at the University of California since 1923. This research is mentioned on pages 270 and 272. The findings have been published occasionally in various dental, medical, and biological journals since 1923, and a detailed summary of the results is about to appear in the *Journal of Dental Research*.

e. Illustrations of desirable research in two fields outlined in subsections c and d preceding

The two ordinary illustrations of desirable dental research that follow suggest not only its wide range and its special difficulties, but also the present weakness in dental know-

ledge of broad biological conditions in general relationships at one extreme, and of narrow biochemical quality of the most common dental tissue at the other. They also indicate the need for constructive activity and adequate financial support in all aspects of investigation in oral health-service.

1. *The types of dental and oral abnormalities that are directly influenced by heredity (page 167)*

Biological observations indicate that conditions of heredity may induce various types of dental development, among them family uniformities in the size, shape, and arrangement of the teeth, individually and collectively; in the thickness of the enamel or the hardness of the dentine; in the shape and capacity of the pulp canal; in the absence of individual teeth or the presence of extra teeth; in the crowding of teeth, with consequent irregular placement and interspacing; in the degree of resistance or susceptibility to decay of the teeth, to periodontal disease, and even to systemic infection from bacteria in dental abscesses. Not only are hereditary deviations from the normal important in themselves, but they may also qualify the effectiveness of hygienic measures for the prevention of oral diseases. A daily bath is a very healthful habit, but it is not a preventive of diabetes or tuberculosis. If dentists had been effectually taught the biological foundations of their functions in health service, and imbued with the spirit of research in their practice in every treatment and for every patient, hereditary influences in dentition would be subjects of continual routine enquiry and general discovery; broader knowledge of hereditary conditions and greater power of prevention would have taken the place of the present ignorance; and the prevailing confusion of hereditary phenomena with those of disease or malnutrition, during the formation of the teeth, would not exist. Dental practitioners have not been taught the biological sciences effectively enough to enable them systematically to recognize the significance of important facts of inheritance even when observed. Under more favorable conditions of education, many dentists would be carefully and systematically recording full biological histories of their patients, in family and racial groups, with a view to the discovery of hereditary factors for personal guidance in treatment and for general publication. Histories of this kind might be recorded to the greatest advantage in the rural communities and small towns, where personal knowledge could be readily acquired directly, particularly by dentists with special opportunities in long-established practices to study the dentition of members of several generations in the same families.

There is growing appreciation of orthodontia because of its utility for the corrective treatment of children with teeth in malocclusion. As a rule the teeth of individuals of native races are regularly placed and interspaced. Biologists suggest that the special need for orthodontia in this country may be due in some degree to the union of persons with dissimilar types of dentition—individuals with small jaws and small teeth mating with

others having large jaws and large teeth — some of their children having small jaws and large teeth, with consequent overcrowding of the dental arch. Dentistry has opinions on this problem, but no proof. Why are the teeth of the healthy full-blooded Negro without any attention to oral hygiene particularly resistant to decay, whereas the teeth of the Anglo-Saxon with all his attention to oral hygiene are very susceptible to caries? Dentistry offers many guesses but does not know. An infected pulpless tooth may be retained in one person for many years without seeming to induce any but immaterial local effects; in another person, such a condition very promptly sets up general debility. Do such persons have different systemic degrees of resistance to the responsible infective organisms; if so, why? Dentists seem to be waiting for others to find out. Biological research with reference to the influence of heredity might provide the answers to each of these questions, and to many more of analogous import. "Oral hygiene" cannot be regarded as successful "preventive dentistry" while means of controlling hereditary dental and oral variations remain undiscovered.

2. *The exact elementary composition and the mineralogical constitution of the inorganic matter in enamel, with particular reference to variations in the resistance to chemical change (page 169)*

Present knowledge of the conditions suggested in the above heading illustrates, from a chemical point of view, the great need for biological research in dentistry. Dental students are usually taught that dental enamel is a mineral tissue composed principally of calcium phosphate. Few learn, however, that this protective coat contains a relatively large number of components in special relationships, or that it has been given so little direct biochemical study that, despite its importance as the site of incipient decay, its constitution is uncertain and the reasons for differences or variations in its susceptibility or resistance to the initiation of the carious processes remain to be determined.

Nearly all of the mineral matter in dental enamel is disposed in microscopic hexagonal rods or prisms. In the light of accordant data of incomplete chemical analysis, this particular physical state, which is unusual under biological conditions, suggests that enamel consists chiefly of apatite (*ἀπατᾶν*, to deceive), a phosphatic mineral that is widely distributed in many varieties and which for centuries was mistaken for others. Among the common forms of apatite are hexagonal crystals, which, colorless or varicolored, transparent or opaque, according to differences in the nature of associated materials, are suggestive of analogies with normal enamel in some respects and with "brown stain" or mottled enamel in others. Although dental enamel is composed mainly of tri-basic calcium phosphate, it also contains magnesium, manganese, chlorine, fluorine, and carbonate. The ordinary types of apatite include forms consisting of three parts of the phosphate and one of calcium chloride in one instance, and three parts of the phosphate and one of calcium fluoride in another. In familiar kinds of apatite, calcium is replaced by magne-

sium or manganese, and chlorine or fluorine by hydroxyl or carbonate, indicating great responsiveness of the mineral to external influences during its formation. All of these elements or radicals are common to animals and plants, and are present in an ordinary diet.

The adjustment of the constituents of enamel during its normal development depends not only on sufficiency and balance of the diet but also on equilibrium of special processes of coordination. The particular forms of apatite that may be produced in enamel are presumably affected by such glands as the parathyroids and thymus, fluctuations in their adaptive influences doubtless causing significant variations in its quality. If these deductions should be verified and extended by research, it might be possible physiologically to strengthen enamel against the action of such external chemical agents as those produced by bacteria, for its resistance may vary with the proportions of the units in the mineralogical structure, or with the nature of the structure itself, and these may be controllable. Although the recent discovery of protein in enamel complicates these views, it also emphasizes the importance of a thorough study of enamel, with special reference to elementary percentage composition, chemical character, mineralogical constitution, histological structure, resistance to solution and disintegration, and relation to the prevention of decay of teeth, the most general and urgent problem in dentistry.

F. PARAMOUNT REQUIREMENTS FOR THE PROMOTION OF RESEARCH IN DENTAL SCHOOLS

Prevention of oral abnormalities cannot be attained unless the many complex problems involved in their control are attacked by a body of active enquirers who are well grounded in the knowledge and methods of the related sciences, animated by the spirit of research, and led, preferably in the dental schools, by wise, trained, and effective investigators. Men and women who would be sufficiently interested in the solution of these problems to devote themselves wholeheartedly to their study, and who would be competent to conduct such work, must be found and encouraged to proceed. This is an important function of the dental schools. Comprehensive and coordinated research in the biological aspects of oral health-service, which is essential for the discovery of ways and means for the prevention of dental defects, cannot be conducted without adequate financial support. The dental schools, now without endowments, cannot provide it; but, if the best schools were given endowment funds in amounts sufficient to enable them to promote research, prospective discoveries of great importance for the prevention of dental and oral distress would be assured, and the public welfare would be enhanced enormously.

CHAPTER X

PROSPECTIVE IMPROVEMENTS OF DENTAL EDUCATION

THE dental profession is a highly skilled and specialized one, and the quality of dental health care is largely dependent upon the quality of dental education. The dental profession is a highly skilled and specialized one, and the quality of dental health care is largely dependent upon the quality of dental education.

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PART III

PROSPECTIVE IMPROVEMENTS OF DENTAL EDUCATION IN THE UNITED STATES

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CONCLUSIONS

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CHAPTER X

PROPOSED GENERAL REORGANIZATION

A. BASIS OF THE SUGGESTED RECONSTRUCTION

THE findings of the present study suggest a reorganization of dental education to include the fundamental changes and extensions indicated by these five general conclusions:

(1) In universities, dentistry, an independent division of health service and, in effect, the oral specialty of the healing art, should receive the quality of consideration and support now deservedly accorded to medicine.

(2) In dental schools, teaching and research should be as effectual as the best in a good university, and the status of dental teachers should be raised accordingly.

(3) The preparatory education of dentists should be equivalent, in general character, to that of physicians, which now includes at least two years of approved work in an accredited academic college after graduation from a four-year high school.

(4) The undergraduate curriculum in dentistry should be devised for intensive preparation for the duties of general practice only, and should be so organized that earnest and competent students could complete the training in three years.

(5) Optional full-year graduate curricula, separate or combined, including dispensary and hospital experience as well as opportunity and encouragement in research, should be provided for all types of specialization in oral science and art, especially those of private practice, public-health administration, teaching, and investigation.

B. NEED FOR EARNEST ATTENTION TO DENTAL EDUCATION IN THE UNIVERSITIES

Dental education cannot achieve its greatest degree of usefulness until the universities, accepting dental practice as an important division of general health service, give their dental schools adequate financial support, raise the quality of dental teaching to the high plane of excellence that its responsibility requires, provide suitable library facilities for dental students, promote both graduate work and research in every aspect of stomatology, and set before dentistry the loftiest ideals of professional character and attainment. Notwithstanding the fact that three-fourths of the dental schools in the United States are parts of universities, the needs of dental education have been receiving only casual attention in most of them; and although only three of the forty-four schools continue to be proprietary, a larger number of the university dental schools are being conducted as commercial accessories. Boards of trustees, misled by the financial achievements of

the private owners of various schools before their absorption into universities, kept in ignorance of the pressing needs of dental education, and encouraged by the traditional view that dentistry is rather a trade than a profession, have assumed that dental schools may be acceptably conducted on a low educational plane at a high profit as financial investments for universities. Medical schools are neither expected nor required to be even self-sustaining, but in some cases have been regularly financed in part with "earnings" from the operation of dental schools, where conditions in a number of universities reflect unfavorably on the educational sincerity of the trustees.

A phase of the neglect of the dental schools in many of the universities is indicated by the lack of suitable libraries in their dental buildings or by the deficiency of dental books and dental journals in their general libraries. The occurrence of such a condition in a proprietary school might be expected, but in a university it cannot be explained creditably. It was said at one university, where the dental school is avowedly conducted for financial profit, that the dental library had been neglected because the dental teachers themselves did not want a library. This idea had been suggested by the fact that as recently as 1920 the Dental Educational Council's requirements for a Class A rating included the provision that, although the school should have a library, it would be adequate if the number of books equaled twice the number of enrolled students. One naturally assumes that university control means something better than this, but more than one university has been content barely to meet such minimum requirements. In the universities, graduate work in dentistry, even in its simpler phases, is almost non-existent, and there has been a general failure to impress upon dental teachers the fundamental relation of graduate study to productive scholarship, and to the development of educational and professional leadership. The indifference to dental research, in the universities, is considered in Chapter IX. A large share of the responsibility for this backward condition is due to over-emphasis by dentists on the manual needs as contrasted with the mental requirements of dental practice, and to indifference among dental teachers to a liberal education as a basis for professional service.

C. REQUIREMENTS FOR THE IMPROVEMENT OF TEACHING AND RESEARCH, AND FOR THE ELEVATION OF THE STATUS OF THE DENTAL TEACHER

The failure of many of the universities to take dental education seriously is shown most strikingly by the prevailing inattention to the quality of the teaching in dental schools, particularly in the subjects that are peculiar to dentistry. Men who have acquired reputations as successful practitioners are made professors regardless of their inability or disinclination to teach, and, given important teaching duties to perform, are retained when their work is uninstrusive or even farcical. They are also permitted to

subordinate their teaching obligations to all the requirements of a routine private practice, and privileged to delegate their duties to recent graduates who, noting the influence on a practitioner's prestige of a public relationship to a dental school, accept the appointments as temporary expedients, and regard the positions mainly as stepping-stones to lucrative local practice. This has been the way of commercialism in dental schools to make money, but some of the universities are following it to evade the duty of giving dental teaching proper support. Special effort should be made to find and suitably remunerate a much larger number of men and women who would make teaching in dentistry their primary professional pursuit, and who would promote research effectively. If the undergraduate curriculum in dental schools were based on two years of study in an academic college, and graduate work were instituted, better teaching of the dental subjects would be necessary; but these advancements would also help to recruit good teachers in larger numbers and to stimulate the spirit of research.

The university dental school in which research is actively in progress, in any but a perfunctory way, is an exception. Most of the research in dentistry in this country has had commercial objectives. Although many millions of dollars have been sought and obtained for the endowment of medical education and research, most of the universities have been unconcerned about similar endowments for dentistry. Contrasted with the generous annual income for the advancement of medicine, the few thousands available for the promotion of dentistry, as summarized on page 150, reveal sharply the indifference of many of the universities to public needs in oral health-service. A dental school of the most useful type cannot thrive on an income consisting solely of the fees paid by students and patients. On such limited financial resources, good teachers cannot be given adequate remuneration and fruitful research is practically impossible.

D. EQUALIZATION OF PRE-DENTAL EDUCATION WITH PRE-MEDICAL EDUCATION

a. General advantages of at least two years of study in an academic college

A broad refining education is a fundamental need for those who devote their lives to the professions of greatest service to humanity, and who aspire to usefulness beyond the responsibilities of the technician. Leadership in the professional sphere, and in the opportunities in social endeavor and influence, is rooted in the soil of a cultural education. Slovenly intellectual habits and undeveloped mental powers are symbols of mediocrity. Only individuals of rare capacity for growth and self-instruction rise above the plane of the artisan, if they have not been well trained to use their minds and, before entering the dental school, have not formed the intellectual habits and developed the

mental capabilities that the study of dentistry requires. In an address before the Dental Alumni Society of the University of Pennsylvania, the present writer summarized substantially as follows "some advantages of a liberal education in the professions, with special reference to dentistry" (*The Alumni Register*, 1924, xxvii, p. 78):

The value of a liberal education in the development of mental quality, personal character, and social intelligence, may be inestimable. The perspective of cultural study guards the mind and the spirit against the relatively narrowing influences of a professional training, and yet adjusts them to its exactions. A sound academic education involves a thorough grounding in fundamentals; intellectual, moral, and spiritual discipline, including self-control; sincere training of the mind; sustained effort at the mastery of subjects of primary import; and development of mental capacity and vigor from intellectual drill. As one enumerates the chief qualities of a good dentist, which he manifests at every stage of his personal service, their number and import become impressive. When a patient presents himself for treatment, a conscientious dentist must experience continuously all the tension of *self-control*. There is the immediate duty of *attention*, the obligation of *courtesy*, and the need for *kindliness*. *Sympathy* for distress or disability tugs at the heart-strings. *Tact* in manner and *good-will* in mode are prerequisites of effective *coöperation* in the patient's predicament and in his behalf. *Enquiry*, in the spirit of research, reveals the conditions that require penetrating *analysis*, full *understanding*, and sharp *discrimination* for the broad *perspective*, clear *vision*, sound *judgment*, and reliable *decision* on which the best service must be solidly based. This, in turn, imposes *responsibility*, requires *resourcefulness*, demands *fidelity*, and impels *generosity* of devotion to all of the ideals of professional purpose. As a rule these requirements must be met standing up, with patient after patient in distress or apprehension; and usually through fatiguing, nerve-racking emergencies, hour by hour, during long and busy days. One might add many more important traits, such as ability, knowledge, courage, esthetic appreciation, digital facility, technical comprehension, etc.; but consider the scope and degree of the intellectual, moral, and spiritual exactions of dental practice that even these few insignia of personality connote. Who would care to say, seriously, that prospective dentists, to exemplify these attributes, need not as a rule give their minds and hearts the best training that may be reasonably acquired, and as early in their careers as possible? Who would declare responsibly that a flood of information about the routine details of the practice of a vocation, and excessive training in manual procedures, can be sufficient preparation for all of the requirements of the practice of modern dentistry — to say nothing of those of the inner life of the practitioner himself?

A liberal education awakens and stimulates curiosity and the spirit of enquiry; expands views and improves judgment; develops the habit of mental effort, and the ability and inclination to remain a serious student throughout a career; enlarges the capacity to think scientifically and constructively; trains in the ways of gathering, assembling,

organizing, and interpreting facts and of grasping principles; promotes discrimination and true perspective, and readiness to sift the important from the immaterial, with open-mindedness and without empiricism or prejudice; inspires conception and application of ideals, constructive use of hypotheses as working agencies, ready adaptability to and coördination of ideas, and growth of intellectual individuality and integrity; kindles imagination; furthers the acquisition of knowledge and the development of vision and wisdom; fosters love of truth; favors realization of universal concepts as reliable foundations for specialization of knowledge or of effort; and facilitates the application of sound and comprehensive reasoning, and also self-discipline, to the solution of the problems of a profession and of a life. A liberal education weaves the fabric of personality and character; illumines the sum of the conditions for the best possible career; affords weights, measures, and balances with which to determine the real values of civilization; prepares for service and leadership in the most difficult relationships of endeavor and responsibility; begets humility, unselfishness, and good citizenship; holds unlimited possibilities for the development of mind, personality, character, manners, conscientiousness, and social consciousness; and strengthens the foundations for every activity and relationship of honorable usefulness and for every personal expectation of deserved contentment.

It is often assumed that several years of college residence automatically or mysteriously present the advantages of a liberal education. But at a college, as in after-life, observation, study, reflection, introspection, and self-instruction in general are essential for the acquisition of a liberal education, which elicits and refines the powers and the qualities that have been enumerated. No college can impart them to a mental vacuum, or to an empty heart, or to a spiritless character; but for the youth having the elements of the requisites for a profession such as dentistry — and no others should be encouraged to enter it — the years of serious intellectual effort at a good academic college may be the crucial period of personal development and refinement, and of preparation for a career of usefulness and distinction.

It is certain that the intellectual power of dentistry would be greatly invigorated if the requirement for admission to dental schools were raised to the minimum now exacted by medical schools. After at least two years of earnest study in an academic college, a prospective dental student not only would enjoy the many direct benefits of such an advanced preliminary education, but also would be more mature, and manually, mentally, and morally better prepared to proceed in a dental school than he could have been two years earlier, immediately after graduation from a high school. He would be a keener student, could be taught dentistry more effectually, would have greater capacity for intellectual growth, would be more competent to teach himself, and would be more likely to acquire scholarly interests and remain an earnest student of the problems of his profession. As a maturing process, the work in a good academic college not only develops the

student's intellectual ability and his powers of discernment and of judgment, but also usefully tests his steadfastness of purpose and his ambition.

In recent years many academic colleges, by a process of inflation owing to the great multiplication of diverse and unrelated courses, have greatly impaired their usefulness as agencies for intellectual improvement. But the futility of making the college a bureau of information has focused attention on the need for a rededication to the ideal that education is primarily a process to train the powers and habits of the mind, and that this can best be attained by adherence to the principles of simplicity, sincerity, and thoroughness, and by rejection of the procedures of a cafeteria. If, along with desirable deflation, the work of the public schools and academic colleges could be more effectually coordinated for the attainment of their intellectual objectives and shortened by two or three years, the growing need for thoroughness in advanced education would not involve excessive delay in the inauguration of a professional career. Meanwhile the professional schools must continue to build upon the foundations laid by the secondary school and by the academic college.

b. Conditions in an academic college that favor orientation of the student

Two years of serious endeavor in an academic college, if suitably planned, would afford a crucial test of a student's interest in dentistry. It would protect him against the consequences of premature estimates of his aptitude, and open new vistas of opportunity, along alternative routes, if earlier professional inclinations were not confirmed. These great advantages would accrue not only from a student's own concern but also from important conditions affecting his effort. In the academic colleges of the United States, in 1900, there were about 93,000 students; in 1923, there were approximately 370,000; and now there are probably 400,000—an increase at about six times the rate of growth of the general population. This extraordinary expansion of the academic colleges has increased the number and complexity of their responsibilities, among which are the duty accurately to estimate the intellectual ability of applicants for admission so that only those who are presumably able to derive commensurate benefits will be accepted, and then, by methods conducive to rigorous mental training sincerely and effectually applied, to help the students to discover and develop their native powers and find the avenues along which their future careers can be most satisfactorily directed. The individual academic college, unless it avowedly restricts its instruction to a definite scope, is under public obligation to provide curricula that are well adapted for the kinds of higher education that the main groups of its students may prefer or need. The historical antagonism between colleges for liberal education and schools for professional training has been succeeded by cooperation.

At present two general aspirations predominate among the purposes of the students in the academic colleges. From the beginning, the larger group desire to improve their intellectual preparation for professions or special occupations. The smaller group seek general culture without reference to particular vocations or utilities. Some academic colleges direct their curricula wholly to the furtherance of the purely cultural aim ; others, mainly to the promotion of the pre-professional objective. In the Academic College of the University of Minnesota, for example, approximately two-thirds of the number of student credit hours of instruction are taken collectively in pre-professional courses, or in subjects that are parts of the curricula of professional schools, or in elective work offered to professional students. Coincidentally with the trend shown by these conditions, there has been a steadily increasing demand in academic colleges for combinations of cultural and practical courses, and curricula for effectual preparation for the professions—for the presentation of a definite intellectual goal that the student clearly perceives and desires to attain. There has also been a growing need for suitable vocational guidance for students who, unable after a trial to meet the intellectual requirements of the cultural curricula and clearly unsuited to professional careers but competent for enlightened activity in less exacting occupations, should be led into fields of usefulness where their abilities would have correlative opportunities. By requiring advanced pre-professional education, medicine has lately been deriving great benefits from the academic processes of preparation and elimination ; but dentistry has enjoyed only a very small share of the advantages that the proposed equalization of pre-dental with pre-medical academic requirements would afford.

c. Desirability of general tests of vocational adaptability during the period of pre-professional education

The need for early reliable determinations of the adaptability of college students for preferred types of careers is growing as the opportunities increase in number and diversity, and as the difficulties attending fortunate selection multiply. A period of two years of residence in an academic college would offer very favorable occasion, through the agency of extra courses, for a useful evaluation of a prospective dental student's ability to practise dentistry, which could be conducted without impairment of the quality of his academic education. Besides tending to make the work more sincere, and to impart coherence and continuity of mental effort, such a trial, by inducing the student to look ahead, would enable him in good time to determine for himself whether his professional aspirations were founded on assured aptitude. In addition to the prerequisites for admission to schools of medicine (page 126), and in furtherance of the proposed vocational test, the academic curriculum for the prospective dental student might include an

extra course in mechanics as an extension of the required work in physics, and courses in esthetics and in oral hygiene. If such extra courses were included in the pre-dental requirement, students who might be unable to take them in the academic colleges of their preference could obtain the instruction in other colleges or at universities during summer sessions. As a group, these extra studies would help the dental aspirant to measure his assumed proclivities, and to initiate development of his professional abilities or to establish his ineptitude; and besides they would afford enlivening assurances, if he had not mistaken his forte, not only that he was on his way but also that he was going toward the goal of his mature preference. If his preliminary education in esthetics afforded experience in some of the typical procedures, and conveyed much of the spirit, of current elementary courses in art appreciation, art structure, carving, designing, drawing, metal-working, and modeling, he would receive the consequent cultural benefits, and his esthetic perceptions would be stimulated in anticipation of his professional responsibilities—and quite incidentally though effectually his digital ability would also be improved. The extra work in oral hygiene, associated with the college's health program, might suitably include the presentation of conditions in a dental school, which would quicken the student's interest in his prospective professional work or clearly indicate mistaken aspirations. The student rather than courses or credits would be the chief concern.

d. Special advantages for dental education

With the standards of pre-dental and pre-medical education equalized as proposed, the curricula for students of medicine and dentistry in the academic college would be much the same and the two groups, if not too large, could usually be taught together. Early association of prospective physicians, surgeons, and dental surgeons, on a plane of educational equality, would be socially and professionally desirable for each group. Laboratory courses in the academic sciences could be more economically and effectually conducted for the united groups of students than for the two separately. Through the agency of a reasonable proportion of desirable elective courses, extra courses, and summer courses, joint programs of pre-medical and pre-dental education could be given a suitable range of adaptability to the diverse academic needs of each type of practitioner. Under these conditions of equality, dental students would not be inferior to medical students in educational preparation or professional outlook, there would be no mental distinctions or reservations between the two groups in the academic college, and coöperation and association in their subsequent health service would be natural, not embarrassed. In the laboratories of medical schools, the medico-dental sciences could be taught to dental students as the intellectual peers of medical students. The teachers of these sciences to dental students would no longer have occasion to assume, as is now generally the case, to the very great detriment of the proper education of dentists, that "almost

anything is good enough for the intellectually inferior students of dentistry." On the contrary, the desirable adaptation and abbreviation of the courses in the medical sciences for dental students, to meet the special needs of the dental practitioner (as suggested on page 193), would be properly regarded as evidence of divergence merely, not of deficiency.

The higher academic requirement for admission to the study of dentistry, by making the pecuniary rewards seem to be too difficult of attainment or too long delayed, would tend to keep out of the dental profession individuals having acute commercial proclivities who would be more useful and more appropriately occupied in one of the trades than in a profession. This loftier educational standard, tending to repel persons of inferior professional instinct, would attract the high-minded men and women to whom professional service makes its strongest appeal and for whom it offers the greatest opportunities for contented usefulness.

e. Academic subjects transferable from the dental to the academic curriculum

One or more of such academic subjects as biology, chemistry, drawing, English, and physics are now parts of the curriculum in most schools of dentistry. In the Dental School associated with the University of Southern California, for example, which, rated Class A by the Dental Educational Council, has been conducting a four-year curriculum on a high-school foundation, 592 hours (288 didactic, 304 laboratory) in a total of 1280 (544 didactic, 736 laboratory) in the first year are devoted, according to the Announcement for 1925-26, to these academic subjects: biology (192), "dental rhetoric" (96), inorganic chemistry (192), physics *without laboratory work* (64), and technical drawing (48). In the second year 144 hours (48 didactic, 96 laboratory) are given to organic chemistry (64) and metallurgy (80), the latter being largely inorganic chemistry — "experiments in demonstration of the theory of chemistry are carried on in the laboratory." Two pre-dental years of study in an academic college would include all of these subjects except metallurgy, and their removal from the four-year dental curriculum would facilitate its complete reorganization.

E. THREE-YEAR UNDERGRADUATE CURRICULUM FOR THE TRAINING OF
GENERAL PRACTITIONERS ONLY

a. Basis of the proposed reduction in the length of the present undergraduate curriculum

If the plane of preliminary education were raised to a requirement of at least two years of approved work in an accredited academic college, including the proposed test of professional aptitude, there would ensue not only a transfer of non-professional courses and

academic parts of some technical courses from the professional curriculum to the pre-professional, but also a consequent higher average in the mental, manual, and esthetic qualifications of the dental students. In the dental school these conditions would require improvement of the teaching, and would also favor marked reduction of the hours devoted excessively to dental mechanics, and subtraction of the hours now given to the redundancies of special aspects of dentistry that should be reserved for graduate curricula. Therefore, it is reasonable to believe that, despite certain desirable additions to the curriculum to improve the correlations with clinical medicine, able and diligent students could be taught the fundamentals so successfully in three years of intensive effort that, at the end of that period, they would be competent safely and worthily to begin the general practice of dentistry. Extension of the academic year to nine or ten months, by prefixing a summer session, would remove any doubt of a capable student's ability to conclude the work of the undergraduate curriculum in three academic years. There is no urgent need for a summer vacation of from three to four months for vigorous young men and women who are preparing to engage in the arduous duties of health service, particularly for students of an art in which manual dexterity in particular procedures, one of the essentials of its practice, can be attained only by persistent effort and retained only by continual application. Summer sessions are now acceptable additions to the work of an increasing number of educational institutions, and the attendance is steadily rising. The usefulness of every dental school would be increased if the service of the infirmary were extended throughout the summer.

The sciences and arts on which dentistry rests are ever becoming wider and deeper, and their applications to dental practice more complex. As a consequence, the effective teaching of dentistry is steadily growing more difficult. But can this situation be met only by automatic quantitative measures or are there thoughtful qualitative means of coping with it? Teachers of dentistry face a common problem: shall they continue to multiply courses to include the successive accretions of details of knowledge, and to use these courses mechanically, in an expanding exaction, as a means of rating the student's efforts to accumulate a required minimum number of credits? Or shall the instructors, from their experience and judgment, aim, by careful reintegrations year by year, to assist the students to teach themselves and to give to the students the guidance that will effectually help them, without waste of time, to attain the goal? If superficial means alone were available, it would require little ingenuity to show mathematically that, in order to teach a student "everything" that a practitioner should ultimately learn and be able to do, the present four-year dental curriculum must be extended immediately to twice its length, and that an additional year would have to be added at intervals of about four years or less to keep pace with the rapid growth of knowledge and understanding. Given opportunity, the individual teacher, in dental schools as in schools of other types, is inclined to increase the allowance of time for the presentation of his subject, even when

its relative consequence may be diminishing, because of a natural tendency to elaborate its details and to exaggerate their significance, to say nothing of the misjudgment that often leads him to attach importance to the trivial, or to distort the perspective of his course in a given curriculum, or to present his subject for the use he himself makes of it. He frequently emphasizes quantity of instruction at the expense of quality, overlooks the importance of establishing clear points of view, and fails to realize the significance of problems and of instruction in the best methods for their solution. Instead of occasional extensions of the time in which departments may elaborate subjects individually and disconnectedly and add new courses on fragments of major subjects, as has long been the custom, diminution of the present total time allowance to a minimum required for effectual teaching of the essentials of each of the main subjects in a reorganized dental curriculum, and appropriate allotments of hours to the individual courses, would be more rational. A deliberate reduction in the amount of basic work to a reasonable minimum would keep the faculties more alert to detect new developments and more responsive to the ideas that flow from recent discoveries. The inherent essentials of each subject could be determined, and a standing statement of them revised from time to time, by the American Association of Dental Schools, or by the Dental Educational Council in collaboration with the organizations represented in it. This could be done advantageously, in accord with the highest ideals of education and practice, for the promotion of all the methods of teaching and examination best adapted to reveal and to develop quality and capacity in the student, and would not require specification of the sequence of courses or of the number of hours to be devoted to any subject. With the fundamentals as the basis of the dental curriculum, adequate opportunity could be given for independent reading and study; the number of hours of prescribed work could be made commensurate with real as contrasted with fancied needs; required elective courses and also optional courses could be offered for better development of the natural interests, native powers, and desirable initiative of the student; and the library and infirmary would become the chief centres of activity in every good school.

There is a widespread notion that a certain degree of mechanical aptitude for dental practice is lost after a very youthful age, "even in those who take to dentistry naturally," if that ability is not sustained and improved by early, intensive, and prolonged digital exercise. Upon this biological hypothesis has been built the current opinion that the requirement of a preliminary education above the plane of the high school tends to prevent the proper preparation of dentists by delaying their professional training until an age when, the potential for manual dexterity having been seriously impaired, the fingers cannot reacquire their pristine facility by any effort or in routine procedures; and that, therefore, it is essential to begin dental education in early youth and more important to train the hands than the mind. But this speculation has not been based upon reliable observations nor founded on authentic research; and, quite inconsistently, those who

endorse it favor long summer vacations for dental students and discontinuance of digital training during these periods. The view ignores the probability that like tools in general, hands and fingers, and also their neuro-muscular coördinations in a given individual, are inherently well adapted to the requirements and exhibition of mechanical facility or they are not. And it disregards the fact that manual dexterity is also correlated with other more fundamental conditions than the age of the individual. Collaborative research into the facts in this relation, by dental schools and departments of psychology in universities, is a matter to which the American Association of Dental Schools might profitably direct its special attention.

b. Importance of a basic undergraduate curriculum for the training of general practitioners only, and the reservation of specialties for graduate curricula

Impressed by the rapid expansion of the body of knowledge underlying the practice of dentistry, and by the steady diversification of its intricate procedures, dental faculties continue to pack minutiae into the undergraduate courses in quantities far beyond a student's capacity to absorb or to assimilate. Much of this wasteful excess is read to the classes, and the students naturally wonder why they should try to remember what their instructors cannot recall and evidently do not use, and why time should be reserved in the curriculum for required attendance at formal readings, by teachers, of details that the students themselves could obtain more usefully and in less time directly from books or copies of manuscripts. Although only very general aspects of important specialties like oral surgery, orthodontia, and prosthodontia can be included effectually in the training of a general practitioner, dental faculties persist in increasing the load on the undergraduate student by gradually enlarging the scope of the redundant instruction in the special phases of practice. There is almost complete failure in the dental schools to recognize the basic need for a well-organized undergraduate curriculum for the intensive training of general practitioners only, together with supplementary optional graduate curricula for equally effectual education in all aspects of oral specialization.

In the Dental Educational Council's undergraduate curriculum (page 120), about 240 hours are devoted to orthodontia (lectures, 32, technic, 48, and a corresponding proportion of 1424 clinical hours—probably 80 hours additional) and oral surgery (principles, 32; clinic, approximately 48), a reservation for these two accredited specialties of practically five times as many hours as the allowance for stated instruction in the correlations between clinical medicine and clinical dentistry. For prospective general practitioners the work in each of these important subjects could be suitably reduced to the essentials for prevention of disease, relief of distress, recognition of disorders in their incipiency, general diagnosis, treatment of minor deficiencies, and helpful action or advice in emer-

gencies or under special conditions. General practitioners so situated that they could not refer unusual patients to specialists would be thrown upon their own resources of courage and common sense, and, presumably responsible individually and always steadily growing in capacity, could be trusted to meet such critical situations effectually. In a similar spirit, some of the more complicated aspects of prosthesis, as now presented to undergraduates, that lie beyond the initial needs of the average general practitioner, might be reserved for the specialty, particularly because the busy dentist, when his intra-oral service requires all of his time, usually and appropriately turns over to a technician the extra-oral hand-work to which he, the practitioner, while an undergraduate was obliged to give excessive attention. If well instructed in fundamentals, a general practitioner could teach himself the way into and through any new procedure of dental mechanics, and in the school would not need to "try everything at least once."

The highest attainable function of an undergraduate curriculum in dentistry is the education of men and women to be wise and capable general practitioners, competent to begin a reliable independent service, and able to learn and also to grow steadily in proficiency and aspiration from experience and study. Instead of proceeding on the view that the undergraduate curriculum should afford a sound education in the fundamentals and an effectual training in the manual essentials of the general practice of dentistry, and that it should also develop strong inclination and ample ability in the student to continue to teach himself as a practitioner, many dental faculties seem to regard the curriculum as an educational kaleidoscope. They fail to consider that instruction and education are not identical, that the presentation of an overabundance of minutiae or the multiplication of insignificant procedures may prevent the promotion of understanding or the development of proficiency, that informational details may soon cease to have current value or cannot be remembered, and that an opportunity to drink from Niagara may not be more satisfying than freedom to drink from a spring. Of course, the more a general practitioner knows of the whole of his art, all other things being equal, the better he can practise a part of it. But it is impossible for a prospective dentist to learn in any school more than a very small fraction of the stored information pertaining to his profession, or to imbibe more than a modicum of the accumulated wisdom of his teachers. He cannot be made a finished product by the time of his graduation, in the sense that he "knows and does everything," and cannot be given much more than the essentials for a confident, dependable, and useful beginning. Examining boards should note this distinction and should recognize the personal signs of capacity and promise. But if the student were imbued with an abiding devotion to the ideals of his profession, appreciative of the human, social, and economic relationships of dental practice, impressed by a proper sense of his limitations in knowledge and capacity, possessed by an eagerness to continue his effort to master the foundations of his art, and animated by ardent desires to grow steadily in comprehension

of medical and mechanical principles and in wisdom respecting their sanitary and artistic applications—all of which it should be the function of the teachers to inculcate—a practitioner beginning with these potentials for self-examination, self-instruction, and self-stimulation would attain degrees of success and contentment in oral health-service that floods of information could never assure.

c. Betterment of the teaching of the undergraduate courses

The main features of the present undergraduate curriculum in dental schools, and some of its deficiencies, are considered on pages 128–138.

1. Mechanical phases

A minimum requirement of two years of approved work in an accredited academic college for admission to the dental school, with attendant diversion of the inept to fields of greater prospective usefulness, would include adequate attention to the principles of mathematics, physics, and mechanics. The improved preparation of the student in these essentials would favor their more effectual correlation with the practical instruction in dentistry, and thus would also facilitate the student's acquisition of the requisite mental aptitude, technical familiarity, and manual dexterity, in much less time than that now assumed to be necessary for these important purposes. Imitation of conventional forms or procedures for the attainment of facility in assigned tasks would no longer be the main features of the technical instruction. The development of constructive imagination, the appreciative use of fundamentals, and the technical adaptability to unforeseen conditions, would be added mental objectives. Improvements in the quality of the instruction in dental mechanics, especially in its prosthetic phases, as well as an important saving of time in this relation, could be effected with the collaboration of teachers of engineering. Such coöperation, shown to special advantage at the University of Michigan (page 199), could be obtained conveniently in most of the university schools, and would be particularly advantageous in the conduct of graduate work in prosthesis.

2. Esthetic features

If the pre-professional education of the prospective dentist included instruction in the science of beauty, for its cultural value, its utility in testing the student's vocational adaptability, and its basic contribution to the quality and spirit of dental practice, he would enter the dental school much better prepared than at present in the principles and import of esthetics, and would more readily acquire felicity in the clinical expression of his ideals of oral and facial comeliness. The desirability of close attention to the esthetic aspects of prosthetic dentistry, during the period of infirmary practice especially, suggests that the coöperation of teachers of fine art would be very useful in certain features

of the clinical instruction. Most of the university schools would be readily able to obtain such assistance, which would also be very helpful in graduate work in the prosthetic phases of dentistry.

The proposed academic education of the prospective dental student in the principles of esthetics (page 186) need not anticipate any particular conditions in dental practice, but it should be directed to the formation of a permanent artistic judgment that would make it impossible for him to tolerate anything that is positively bad in any form of art. This is one of the most important phases of culture in any civilization, and one that is seriously neglected in this country. In the dental school, however, the student should receive a training in applied esthetics that would not only make him intolerant of bad art in dentistry but also give him the necessary knowledge, taste, and ability to plan and execute prosthetic work in conformity with the ideals of beauty, to direct technicians to the most artistic results, and to instruct patients in oral esthetics. The vulgar taste of a large majority of the public, as to good art in dental prosthesis, is striking proof of the need for better education in this field. The demand, especially by many women, for small white teeth, evenly or mechanically arranged without the slightest reference to the demands of typical form, is an evidence of bad taste that the dentist should seek to overcome (page 131).

3. *Medical sciences*

Some of the prospective favorable influences of an equalization of pre-medical and pre-dental requirements, on the instruction of dental students in the medico-dental subjects, are noted on page 186. The teaching of the medical sciences has long been one of the most difficult phases of dental education. For most of the university dental schools, it is now conducted in laboratories in the medical buildings by members of the medical departments. The instruction of dental students in these sciences could be materially improved by better adaptation of the courses to the needs of dentists. In this relation cooperating medical teachers should give due attention to the fact that a prospective general practitioner of dentistry, who may not treat diseases outside of the oral domain, must receive extensive special training in various mechanical and esthetic procedures, which, not being among the concerns of a physician, make dentistry a unique division of the healing art. Instruction in these important matters cannot be developed satisfactorily by direct and delayed addition to a full curriculum in medicine. Their peculiarities make it necessary to train the main body of dentists from the beginning as avowed specialists in oral health-service.¹ As a rule the attendance at medical schools is large enough to require division of the classes of medical students into sections for their proper laboratory instruction. If it were desired to teach dental and medical students together, the

¹ No other form of specialization in health service, except nursing, has as many practitioners as dentistry. In the United States there are now (1925) about 16,000 specialists of the practice of conventional medicine, and nearly 70,000 dentists (page 85). The dentists are increasing more rapidly than the specialists of medical practice.

facilities in most of the medical schools would be inadequate for the purpose, and neither group of students could be given suitable attention without marked diminution in the number of each. Therefore, under the usual conditions of attendance, it would be impossible or very inconvenient to unite the medical and dental students for laboratory work in the same classes or sections. This unavoidable physical difficulty harmonizes, however, with the desirability of giving most of the instruction in the medical sciences to the two groups of students independently, for each should be guided through the work with the relative utilities of the medical sciences clearly in view. Association of the two groups of students at lectures, demonstrations, and conferences on general aspects of these subjects, so far as it might be arranged conveniently, would favor attainment of practical equality in the general character of this instruction.

The courses in the medical sciences should be adapted to the needs of dental students by suitable reorganization, condensation, coördination, and clinical application, and with due emphasis on oral phases of each subject. This could be done without any impairment of the intellectual quality or the practical value of the instruction as contrasted with that for medical students. These sciences should be taught not only to provide useful medical information but also, and primarily, to develop appreciation and comprehension of medical principles. Dentists, having acquired a medical outlook as undergraduates, could then exercise their diagnostic skill, mechanical ingenuity, and manual dexterity with the medical understanding upon which successful practice of any important branch of health service depends. Unfortunately, in many university schools, such a careful readjustment and correlation to the needs of the prospective practitioner of dentistry would disturb the serenity of members of medical faculties who control instruction in the medical sciences and who, shirking the duties of teaching and desiring an easy solution of the problem, prefer to repeat mechanically for dental students the corresponding laboratory courses given to medical students. Nevertheless, dental faculties should be prepared to show why adaptations of the courses are needed and how they might be made, and why teachers who would be interested in giving the courses properly to dental students should be carefully selected for the purpose.

In general, the teachers of the medical sciences to dental undergraduates should be dental surgeons wherever dentists with adequate special training and scholarly capacity in these subjects are available, but at present very few are able to qualify for such service. Pending the development of an adequate number of dentists fully competent to teach the medical sciences, the courses in these subjects in the dental curriculum can best be taught by sympathetic members of the medical staff, who should also serve as members of the dental faculty or be subject to its jurisdiction in the coöperative instruction of dental students. When dental students of intellectual quality and professional outlook similar to those in medicine are involved, as would generally be the case after the pro-

posed equalization of pre-dental and pre-medical requirements, accord in both administrative and educational arrangements in this relation should not be difficult.

There is steady growth of responsible conviction that the medical sciences as they are usually taught to medical students could be made more valuable, with a considerable saving of time, if the formal courses were condensed into basic presentations of principles, and if each science were also informally integrated with the clinical work. The stated courses in these subjects should be reduced to what would probably be fruitful in developing medical understanding and to what is actually used in medical practice, and should be presented with due regard for the laws of learning. The student, instead of receiving suggestions that these courses afford his only opportunity to "learn the subjects," should be taught that they are introductions only, and that each subject should be studiously pursued thereafter, not merely passed and then ignored. These courses, organized behind departmental intrenchments, kept in closely guarded compartments, and frequently regarded as insignia of traditional partisanship, are taught under the direction of an increasing number of instructors who, disliking the "routine work" and minimizing its importance, take from a studious performance of their teaching duties as much time as they may for more agreeable diversion, often in research. Many of these instructors, selected without reference to teaching ability and frequently in complete disregard for obvious deficiency, present the subjects primarily from the standpoint of their personal use of them, and as if the courses were intended for prospective investigators or specialists, rather than for general practitioners. As now offered, these courses usually present many facts and opinions before the student has been prepared to comprehend their significance. They may train his memory, but they cultivate neither his understanding nor his judgment. They fail to develop facility in the use of principles for the solution of problems, or for the resolution of difficulties, or for prompt accommodations in emergencies. Ability to weigh evidence and power to draw conclusions with intellectual independence, both of which are essentials in the practice of medicine, are given little opportunity for revelation or for exercise. The development of a "scientific attitude of mind in the physician," which is an earnest objective of the present system of isolated courses in the medical sciences, is not promoted in a student but rather hindered by a struggle to memorize a recurrent array of facts that have not been clearly correlated, and which are too multitudinous or too insignificant for the teachers of the clinical subjects to recall or to apply. "Scientific initiative" cannot be developed by such depressing conditions, unless it arises among a few as a result of their reaction against the prevailing discouragement. Dental faculties, seeking to obtain effectual cooperation from medical schools in the instruction of dental students, should note the significance of such current views, and, in the organization of their courses in the medico-dental subjects, should reject for dentistry any deficiencies in the medical curriculum that convenience or inertia may tend to maintain.

4. *Clinical work*

In most of the dental schools the instruction in clinical dentistry is notably successful, but should be improved by an increase in the number of whole-time teachers, and in both the applications of the medical sciences and the correlations with clinical medicine. A suitable extension of time for these betterments, and the subtraction of the corresponding hours from the large number ordinarily reserved for manual training, could have no perceptible effect on the digital dexterity of the student, but would certainly bring about a pronounced improvement of his medical comprehension. If the increased attention to clinical medicine included observations in a dispensary or hospital, or both and their suitable correlations with the instruction in clinical dentistry, the time and effort thus expended would yield substantial returns in medical understanding, stimulating experience, and practical proficiency. Such opportunities to assimilate the best in the wisdom of experienced teachers of clinical medicine in its complex relation to clinical dentistry would be exceptional for a large number of students who, after the initiation of their practice, would find it difficult to teach themselves effectually in this field. If this readjustment in behalf of better instruction in clinical medicine in its relation to dentistry caused a real loss for the student in dental mechanics, which seems highly improbable, it could easily be repaired after graduation by practice and repetition in the self-instruction that his training in dental technology would facilitate.

On a basis of broader general education, improved mechanical facility, greater esthetic felicity, and better medical understanding, the courses in clinical dentistry could be developed to the highest degree of efficiency, because all of the principles involved would be better comprehended by the student, all of the applications and correlations could be made more effectually, and the work would be more scientific and less empirical in all respects.

The great urgency of preventive dentistry for children (pages 79 and 232), including operative procedures to secure it (page 166), makes a children's department of the infirmary an essential feature of modern clinical instruction in dentistry, and suggests adequate development of this service in every dental school, especially with the close collaboration of pediatricians.

d. Feasibility of the proposed reduction in the length of the undergraduate professional curriculum from four years to three

1. *Sanctioned by a permissive rule of the Dental Educational Council*

The suggestion that the undergraduate curriculum in dentistry, if based on two years of approved work in an accredited academic college, can be suitably reduced in length from four years to three (page 179), is supported directly by important recent experience. The Dental Educational Council, in its booklets on Minimum Requirements for Class

A Dental Schools, as issued in 1920 and 1922, included in Article III, on advanced standing, a section (3) which continues in force and reads as follows:

"Students who present sixty or more semester hours of credit from a standard college or university [two years of work in an academic college], in addition to fifteen units of secondary-school education [full curriculum in a four-year high school], and who present satisfactory credits for one school year of college English, two school years of college chemistry, one school year of college physics, and one school year of college biology or zoölogy—*provided* that these courses are fully equivalent to the corresponding courses of the first year of the dental curriculum—may be allowed to complete the dental course in three years; *provided further*, that the dental school can arrange a satisfactory schedule so that such students can get courses in the dental subjects taught in the first year of the dental curriculum. Such courses must be fully equivalent to the regular courses of the first year and must be given systematically under competent instructors. Such courses must be taken so as not to diminish the efficiency of the regular work of the second year, and must be completed before the work of the third year is begun."

2. *Experience with students admitted from the academic college to advanced standing*

(a) General

Although the original adoption and the continuance of the foregoing rule indicated the Council's willingness to sanction a shortening of the four-year curriculum to one of three years, for the few individuals to whom it was expected occasionally to apply, the full significance of this concession, as a basis for prospective reorganization of the dental curriculum, was not appreciated. Early during the present study, suitable enquiries addressed to members of dental faculties and of state boards of dental examiners developed clear evidence that as a rule the students, who on this academic basis had been admitted to the second of the four years of the dental curriculum, were capable, passed with credit the required courses, and, after their graduation, excelled in the license examinations, were admitted to practice, and were regarded as competent dentists. At a few schools, where strong prejudice prevailed against high academic standards, it was suggested that students who had been admitted to the sophomore class, after completion of two years of work in an academic college, were "all right in the head and heart, but a little off in the fingers." Where the bias was in favor of high academic standards, such students were regarded as "among the best in the class."

(b) Observations at Marquette

The most important formal evidence in this relation, because it was obviously free from all preconceptions in favor of the conclusions it justifies, has recently been published by the Dean of the Dental School of Marquette University, who included the following remarks in a statement of the reasons for his conversion to support of the

"two-three-graduate plan,"¹ and for Marquette University's decision to begin to enact it in September, 1925 (*Proceedings of the American Association of Dental Schools, 1925*, ii, pp. 65-67):

"The school with which I am connected has accepted sophomores on this basis [the Council's permissive rule quoted above] since 1919. . . . Thus we have had five years of experience with a two-three plan—and let me assert that it has been a most happy experience. . . . Of course we were merely following the prescribed rules of the Dental Educational Council of America and had no idea that we were experimenting with the two-three plan or any other plan at the time. When the two-three-graduate plan was first proposed [March, 1924] . . . I opposed it because I did not believe it to be workable and practical. . . . But . . . even though I was not favorably impressed . . . at the time, I remembered, more or less clearly, that we had graduated a number of men who had been admitted as sophomores with two years of prescribed liberal-arts-college work and that these men were among the leaders in their classes. One of the first things I did after my return . . . [from the meeting in March, 1924, at which the two-three-graduate plan had been formally presented] was to call for the records of these men, in order to analyze them.

"I found that since 1919 we have admitted nineteen students who were prepared, according to the rules of the Council, to enter our sophomore class. Of these, seven have been graduated and twelve are still students. The seven graduates had weighted averages of 91, 89, 90, 88, 87, 85, and 89, for the three years . . . in all courses. That this is an excellent record will be seen when I tell you that the average grade given in the college is a little more than 81. The clinic grades of these seven men were of the same character: namely, 92, 89, 80, 94, [84,]² 90, and 90. The average grade given in the clinic is 82.

"Seven of the twelve students now in attendance are seniors [1924-25]. The weighted averages of these men during their sophomore and junior years, and the first semester of their senior year, were 89, 85, 91, 88, 90, 85, and 90. Their clinic averages during the junior year and the first semester of the senior year were 90, 85, 89, 94, 95, 80, and 90.³ It may be said for the student whose grade is 80 that he is handicapped by the fact that he is working his way through school. One of the twelve students now in attendance is a junior. His general average is 90. His average in technic classes and clinic is 87. The remaining four students are sophomores. They are all in the highest quarter of their class. Their average grade is 90. Their average technic grade is 91. . . .

"Of the entire group of nineteen students, only two ever received grades that were

¹ Beginning in the spring of 1922, the coordination of a two-year academic curriculum, a three-year undergraduate professional curriculum, and optional full-year graduate curricula, as a possible basis for the reorganization of dental education, was analyzed privately by the present writer with many advisers. It was mentioned casually by one of the advisers during a public discussion at the final meeting of the American Institute of Dental Teachers, in January, 1923. At the first annual meeting of the American Association of Dental Schools, in March, 1924, the plan was presented formally, as one of the findings of this study. For convenience in private discussion the plan was termed informally the "two-three-graduate plan," by which it is now currently designated. Under that title, at the second annual meeting of the American Association of Dental Schools, in March, 1925, the plan was included in a symposium on the prospective reorganization of dental education.

² By a typographical error, the fifth average was omitted from the official record in the *Proceedings*.

³ At graduation in 1925, the weighted averages for the same students, for their sophomore, junior, and senior years, were respectively 89, 85, 90, 87, 89, 85, and 89; and for their clinical work, for the junior and senior years, respectively 90, 86, 91, 94, 93, 83, and 92. (*Dean of the School: June 29, 1925.*) Each of these seven graduates passed state-board examinations and has been licensed to practise dentistry. (*Secretary of the School: July 18, 1925.*)

below passing. One of the graduates received a condition in anesthesia in his junior year. Another graduate received a condition in clinic work during the first semester of his junior year, but finished his senior year with a grade of 90. Of the students now in attendance, none have thus far received a grade below passing.

"In order to be thorough in my discussion of these men, I will admit that they all received special instruction in prosthetic technic and dental anatomy during the four weeks preceding their sophomore year, but the Faculty went to this additional trouble only because it was difficult (though not impossible) to arrange a satisfactory sophomore schedule for them. This special attention might have been given to them during the sophomore year, if the group had been large enough to warrant the effort on the part of the Faculty.

"From this analysis we arrive at the definite conclusion that not only is the two-three plan possible but it is highly desirable in the light of past experience. Our experience of five years clearly shows that the two-three plan develops superior students. Most of these young men had determined to take up medicine when they began their liberal arts course. At the end of their pre-medical course they deliberately gave up their idea of becoming physicians, choosing dentistry in preference. They were mature enough to make an intelligent choice. They had been well trained by reason of their two years in liberal arts. The inevitable result was that they became excellent students and will become dentists who are a credit to the profession."

(c) Approbative decisions of state boards of dental examiners

The Dental Educational Council has found no occasion to rescind the permissive regulation quoted on page 197. State boards of dental examiners, on the foundation of experience, within the bounds of common sense, and in harmony with the Council's view, have concluded that dental schools are free to admit students to advanced standing, and that a legal requirement of graduation from a four-year curriculum in dentistry, as a prerequisite for admission to a license examination, does not predicate four years of residence in a single institution of any particular type. These boards have taken the broad and reasonable view that the laws in this regard aim only to assure the knowledge and proficiency that are usually gained from completion of a four-year dental curriculum, as attested by the diploma of a reputable dental school that regularly awards its degree to graduates of such a curriculum — or to graduates of the full equivalent of a four-year curriculum, as determined by the faculty of a reputable school.

3. *Important saving of time in the teaching of dental technology at Michigan*

Highly significant from another point of view in this relation, as expressive of the outcome of educational research in progress, were the following statements of the Dean of the Dental School of the University of Michigan in his presidential address at the meeting of the American Association of Dental Schools, in March, 1925 (*Proceedings*, ii, pp. 188-189):

"The courses in technics are too narrow, unnecessarily long, and are not based sufficiently upon the physical sciences, and the clinics bear a direct relationship to the

technic courses. . . . Our faculty has been conducting some experiments to ascertain whether it was necessary to spend as much time at technics as we have formerly done. . . . One of the first things we did was to eliminate the so-called dental technics during the first professional year and substitute shop practice and drawing in the engineering college, and mineralogy in the literary college, all of which took far less time than the former dental technics. The all-around ingenuity and technical ability of students who had only this limited contact with the engineering college became at once obvious and suggested a cut in the so-called dental technics that we had required in the sophomore year. This we carried out with caution and at the same time improved our teaching staff. About six years ago we had as high as from 1600 to 1800 laboratory hours required of dental students for technics. To-day, we have reduced the number to about 800, including porcelain technics that are not taught until the students have had some general operative experience, and our students are better prepared for the future than at any time in the history of the college. . . . I am firmly convinced that dentistry has wasted . . . time in technical laboratories [by using more] than was necessary to prepare the average student. . . . I believe that a reduction of at least 50 per cent in time is possible in most schools and at the same time the student will be better prepared. . . . A little science applied to the subject of technics will immediately reduce the time required and improve the quality of our product . . . [and] fully meet the expectations of the *most exacting in technics.*"

F. VARIOUS TYPES OF COMBINED UNDERGRADUATE CURRICULA

Combined undergraduate curricula for effective general training in dentistry and in medicine jointly, or in dentistry and in other fields, such as education and public-health administration, through periods of three to five years or more, would favor the development of better service on the borderlines between domains where formal boundaries are becoming indistinct. Such combined curricula in dentistry and medicine, founded on two years of pre-professional study in an academic college, are needed in several universities to improve particularly the foundations for the practice of oral diagnosis and maxillo-facial surgery and to train consulting stomatologists. In this country dentists may legally practise maxillo-facial surgery, but, being heavily charged with complicated and immediately serious medical responsibility, it should be based on the essentials of the education required of general surgeons, with collateral or supplementary instruction in the related aspects of dentistry. Combined undergraduate medical and dental curricula would provide effectually for adequate general training in these relationships, and would be a sound basis for advanced study in graduate curricula. Neither medical schools nor dental schools have made suitable provision for effectual education in these difficult aspects of oral health-service. There are no professional degrees for specialists in dentistry, although D.D.Sc. has been awarded to a few graduate students (page 202).

G. GRADUATE WORK FOR ALL TYPES OF ORAL SPECIALIZATION

The larger share of the work of preventing and treating dental disorders, and of fitting sanitary and pleasing substitutes for deficient or lost parts, must be accomplished by general practitioners, whose broad training is the primary object of dental education; but certain aspects of dentistry, especially the most intricate mechanically, the most difficult esthetically, or the most responsible medically, cannot be practised expertly without extended experience or supplementary special training. The various extension, advanced, and "post-graduate" courses now being offered in increasing number, although very desirable for the further education of general practitioners, cannot, because of their unavoidable brevity, provide intensive or thorough training for the most efficient practice of such specialties as oral diagnosis, oral surgery, orthodontia, and prosthodontia, which can be obtained only through combined medical and dental curricula, as suggested above, or through graduate curricula equal in length and in character to such as are offered in universities to candidates for higher degrees. If the example of the five universities that now conduct graduate curricula in dentistry were followed generally, the proprietary "post-graduate" schools would succumb from malnutrition.

Graduate work should obviously be based directly on the undergraduate dental curriculum, or on combinations of the undergraduate dental curriculum with similar curricula in medicine or in other fields, and could be begun in the year succeeding graduation or later. As a rule, however, graduate work in further preparation for the practice of a specialty can be undertaken most advantageously after experience in general practice has not only developed strong inclination but also revealed particular aptitude. Ample opportunity could be afforded to general practitioners, as special students, to take parts or all of given graduate courses; and portions could also be offered as extension courses. In dentistry, as in medicine, recent graduates show increasing tendency to become specialists.

The two-three-graduate plan comprehends effectual training for the practice of the dental specialties, and also contemplates the termination of present conditions under which any one who has been admitted to the general practice of dentistry may publicly announce himself to be an expert in a particular branch, irrespective of the validity of his claim. Further abuses of this privilege should be prevented. It would seem to be obvious that any person who has been licensed as a dentist should be free to practise any part of an accredited specialty of dentistry, provided he does so in the ordinary course of his general service, just as under analogous conditions a physician may legally do any act within the field of dentistry, if it is performed in a routine way for the treatment of disease, the relief of suffering, or the removal of disability, although not avowedly as dentistry. But just as a physician, without a license to practise dentistry, may not lawfully represent himself to be a dentist, so also a dentist who may justifiably regard himself as being superior to general practitioners in a particular aspect of the art should be obliged

to demonstrate to the state's examiners the validity of such a claim before being permitted to induce the public to believe it. Adequate graduate study as provided in the two-three-graduate plan, a supplementary license, and periodic registration, would expedite the most skilful practice of the specialties, and also would fully safeguard the interests of the public and of the profession. The usefulness of a national board of dental examiners, in helping to determine the general acceptability of specialists, is suggested on page 70.

H. GENERAL ASPECTS OF THE "TWO-THREE-GRADUATE PLAN"

a. Academic and professional degrees

The plan of requiring two years of approved work in an accredited academic college for admission to dental schools, reducing the length of the undergraduate dental curriculum from four years to three, and providing optional full-year graduate curricula for all types of specialization in oral science and art, would be analogous, in gradation of academic values and in relationships of courses and advanced professional opportunities, to the programs of studies in universities that now lead to the award, respectively, of the bachelor, master, and doctoral degrees, and could reasonably be expected to exercise similarly advantageous educational and professional influences in dentistry. On this general plan, including the two-year pre-dental curriculum, the degree of B.S. might be awarded, to fully qualified students on a plane of scholarship appreciably higher than the passing grade, at the end of the second or third dental year; the professional degree, at the end of the third dental year; M.S., at the end of a first graduate year; and Ph.D., according to the nature, extent, and quality of the work accomplished, after two or more additional graduate years. On a combination of the undergraduate dental curriculum with other undergraduate curricula, appropriate degrees, such as M.B. and D.D.S., might be awarded to indicate the coördinated types of training.

Among teachers it is a matter of general regret that the doctorate was ever used to indicate completion of undergraduate courses in medicine and dentistry, for the corresponding baccalaureates would have served every useful public purpose as well or better; they would also have been academically analogous to other bachelor degrees; and their award would not have implied the acquisition of advanced professional knowledge and training, which the doctoral degrees in medicine and dentistry have never truly indicated. If the degrees of Bachelor of Medicine and Bachelor of Dental Surgery had been regarded as academic signs of ability safely to begin the dependable practice of the corresponding arts, higher degrees of conventional usage might have been effectually employed to signalize successive advancements. If the degrees of Master of Dental Surgery and Doctor of Dental Surgery had been used as proper incentives to further intellectual and professional effort among dentists, they would now be helpful to distinguish

completion of various stages of development in ability, experience, and wisdom, to the highest possible satisfaction of both the public and the dental profession. But long established customs rarely yield to the persuasions of logic. With medicine in this country showing no signs of willingness to substitute a baccalaureate for a doctorate, as the mark of ability to engage in general practice, dentistry, aiming to become the full service equivalent of an oral specialty of medicine, would be unwise to abandon the symbol of professional equality. Many statutes specify the doctorate as the professional degree in medicine and in dentistry. There is no demand in either profession for a change in this specific provision of the laws and no likelihood of public concern about it in the future.

b. Summary of advantages

The proposed coordination of two academic years, three professional years, and one or more optional graduate years would afford so many improvements over the present situation in dental education that some of its advantages may now be suitably summarized, for convenient review as an introduction to a discussion of disadvantages of the plan. The years, months, weeks, and days are those of conventional length unless otherwise indicated.

(1) An admission requirement of at least two years of approved work in an accredited academic college would help dental students to attain a plane of intellectual equality with students of medicine. Through the agency of several extra courses that would be both cultural and determinative of vocational aptitude, it would also favor more effective and timely selection of individuals suited for the practice of dentistry. It would facilitate economic readjustments of professional plans by which, for example, after discovery of unexpected talents or preferences, prospective dental students might advantageously become students of medicine, or vice versa. Supplementary work in summer sessions would help students from some of the smaller academic colleges to meet the extra requirements. The two-year standard would present a sound basis for the subsequent award of the B.S. degree to the most competent dental students, as well as for the evolution of graduate work of the highest quality. As a consequence of the elimination of academic subjects from the professional curriculum, through earlier presentation of them in the academic college, the dental curriculum could be materially shortened, and the correlation of academic subjects with those of dentistry could be greatly improved.

(2) Reduction in the minimum length of the undergraduate dental curriculum from four years to three, by elimination of courses in academic subjects and saving of time in their more effectual applications, by subtraction of hours devoted excessively to dental mechanics, and by postponement of needless instruction in specialties to graduate years, would not interfere with proper teaching of any of the subjects that should be presented to dental students, nor prevent adequate attention to correlations with clinical medicine. These

reductions and readjustments, accompanied by better adaptation and some abbreviation of the courses in the medical sciences, would make it possible to improve the sequence and coördination of all of the courses, and to give them more deliberate attention, without overcrowding the curriculum beyond the requirements of an intensive program. Extension of the academic year, by beginning it with a summer session, would remove any doubt regarding the feasibility of this phase of the plan.

(3) Optional full-year graduate curricula would place the specialties of oral science and art on a sound educational footing and on a responsible professional basis, and would also encourage advanced work, improve teaching, and promote research.

(4) In its entirety the plan would closely coördinate dental education with higher education in general, and with medical education in particular, and with public needs in oral health-service, and would raise the professional quality of dentistry and the aspirations of dentists. By elevating to a high plane the minimum requirement in academic education for independent general practitioners, without making the total period of preparation for practice excessive in length, the plan would dissuade laboratory technicians from becoming pretenders in dental practice or from making organized attempts to induce legislatures to substitute ignorance for education in the public regulation of responsible oral health-service. By removing the necessity for the creation of a medical specialty of stomatology, to replace a deficient dentistry, the plan would prevent the damage and demoralization involved in a conflict between organized dentistry and organized medicine on that issue. To advance with cumulative success as a mode of health service, dentistry, represented by the great body of independent general practitioners, must be intellectually vigorous, mechanically facile, esthetically felicitous, medically competent, ethically sincere, professionally keen, and socially altruistic. The "two-three-graduate plan," under the direction of able and contented teachers devoted to the ideals of public service, would favor the development and manifestation of all of these qualities in the average student.

The plan, a tripartite program of essentials, is like a skeleton rather than a fully organized body, and therefore, in its use, is susceptible of wide variation and of free expression of preferences. Its primary phases can be adopted separately, experimentally, and gradually, without impairment of the system into which they may be fitted. It would impart both elasticity and diversity to dental education, for it is neither a mould nor a strait-jacket. It suggests conditions that are suitable for general adoption as minima. By lengthening the professional years so that three would have the content of four, schools that now prefer a conventional two-four plan without reference to graduate work could save a year of the practitioner's time for professional service. Tuition fees, teaching salaries, etc., would presumably be readjusted accordingly. The optional graduate phase provides in effect, by addition, two-four, two-five, and two-six plans culminating in all aspects of oral specialization and research. The plan presents a basis for close coöperation between

medical and dental schools, and favors an evolution in the relationship between medicine and dentistry that would be entirely natural and in full accord with the future responsibilities of each.

c. Discussion of suggested disadvantages

Among the disadvantages that might arise from adoption of the "two-three-graduate plan," only four of the few that have been suggested appear to be significant. It is believed by some that a two-year academic standard for admission to dental schools would repel the main body of desirable prospective dentists, and, by diverting most of them to other fields of usefulness, would permanently reduce the number of practitioners below the public requirements in dental service; but there is nothing in experience or probability to justify such a fear (page 83). In medicine the elevation of the pre-professional standard has raised the intellectual average, and also has effected very desirable eliminations, without causing more than a temporary reduction in the number of practitioners at a time when their number was excessive. The belief cited above seems never to have been suggested by any one who appreciates the significance of the trend of students to the academic colleges. From 1890 to 1922, when the growth of the general population was 73.5 per cent, the increase in the attendance at the academic colleges was 346 per cent. From 1900 to 1910 the total population of the United States increased 21 per cent; the number of students in the academic colleges in the same period rose, in the South, 34 per cent; in the North and West, 109 per cent; in the whole country, 85 per cent. From 1910 to 1920 the total population increased 14.9 per cent; the number of students in the academic colleges in the same decade rose, in the South, 80 per cent; in the North and West, 100 per cent; in the country as a whole, 96 per cent. From 1900 to 1923, the absolute number of students in the academic colleges increased, in the South, from 28,000 to 74,000; in the North and West, from 65,000 to 296,000; in the country as a whole, from 93,000 to 370,000. Now there are approximately 400,000 such students, and probably a large majority are preparing for careers in the professions. In an era when oral health-service is steadily rising in public esteem, it is highly improbable that dentistry is falling into disrepute among the most intelligent young men and women in the country. Practically all of the dental schools will exact at least one year of work in an academic college for admission beginning in 1926-27, in conformity with the Dental Educational Council's requirements for a rating of acceptability thereafter. It is unreasonable to suppose that any important number of desirable persons who would undertake the study of dentistry on the basis of one year of academic work followed by a four-year professional curriculum — a total of five years — would be discouraged by a program of equal length consisting of two years of academic study followed by a three-year professional curriculum. On the contrary, removal of the prevailing opinion that dentistry as a profession is intellectually inferior to medicine, and elimination of that deterrent against its selection for a career

of usefulness, would probably be followed by marked increase in the number of those who would aspire to be among the best dentists.

It is feared by some that reduction in the length of the professional curriculum would make it impossible to give to the medical sciences the attention they deserve. This difficulty disappears when, by comparative examination of curricula, it is found that, if the courses in the medical sciences are suitably adapted to the needs of dental students, reduced to basic presentations of principles, freed from redundant details, and in part taught in close integration with clinical dentistry and in its correlations with clinical medicine, they can be effectually presented during the first and second years in proper sequence without overcrowding the curriculum and without disturbing any other desirable correlations. But in schools where this appears to be undesirable, the proposed extension of the academic year (page 188) would afford ample opportunity to retain all of the favorite excesses without requiring the students to remain another year in residence.

A number of executives have suggested that the years of the undergraduate curriculum cannot be lengthened to give three years the content of four, where that might be desired, because "it would disorganize the whole University [sic] . . . and [also] the dates fixed for license examinations." The proposed extension would do neither, if the academic years in the dental school were begun in summer sessions, to which teachers and universities have become accustomed. Annual vacations for teachers could readily be readjusted to this program. Loan funds could be used to help needy students.

The most important objection is the likelihood that, by reduction in the number of undergraduate classes from four to three, the annual income from tuition fees in a given school would be seriously diminished. Independent dental schools would doubtless find this obstacle insurmountable, but there are now only five such schools and these will soon become integral parts of universities or be discontinued. In the universities having dental schools, the full equivalent of the missing fourth-year dental classes would probably be resident in the academic colleges, paying tuition fees there; and graduate students in dentistry would pay the corresponding fees to the university treasurers. Universities alive to their responsibility in dental education will seek endowment funds for the proper maintenance of the dental schools. It is reasonable to assume that when the public learns the nature and extent of the needs of dental schools for the furtherance of teaching, for the improvement of practice, and for the advancement of research in the field of health-service, the necessary gifts will be forthcoming. Without adequate endowments, or the equivalent in current income, the dental schools will be obliged to continue a program intended in many cases primarily to keep themselves alive, and to prolong the residence of students, rather than to give the students what a modern dental school with proper public support should offer on a plan of economic, intensive, and integrated effort.

CHAPTER III

PART I. HISTORY OF CANADA

PART II. EDUCATION

PART IV

DENTAL EDUCATION IN CANADA

CHAPTER XI

DENTAL EDUCATION IN CANADA

A. INTRODUCTION

THE main features of dental education in Canada and in the United States are so similar that such differences as may be noted are not greater, in general, than those existing between the best dental schools in any pair of American states. Intercourse between the two countries having been free for more than a century, the interchange of professional and personal courtesies having been uninterruptedly cordial and sincere, and the benefits of this interrelationship having been mutually helpful and sustaining, it has required persistent effort, throughout the present study and in the preparation of this Bulletin, to restrain the spontaneous tendency to think and write of the dental schools in Canada and in the United States as units of a single system.

In Canada dentistry, regulated by law as an independent profession, is closely organized nationally, provincially, and in the urban centres of population, and supports a number of important journals devoted to its advancement. In the Dominion there are five dental schools, all of which are integral parts of universities. The distinctive professional degree, awarded by universities, is D.D.S.; the license to practise confers formally the professional title of Licentiate of Dental Surgery (L.D.S.).¹ With a much smaller population than that of the United States, and a less urgent public need, the institutional teaching of dentistry was not successfully inaugurated in Canada until 1875, the year in which the College of Dental Surgery of the University of Michigan was established and thirty-five years after the organization of the Baltimore College of Dental Surgery. The extended experience of the dental schools in America was helpful to the founders of the first Canadian school, and the precedents established on this basis have been followed by each of the succeeding schools in the Dominion. As a consequence, the lines of progress in dental education in both countries during the past fifty years have been essentially parallel, although training for general practice by apprenticeship continues to be legal in some of the provinces.² In Canada, however, the proprietary schools disappeared more promptly than in the United States; and a five-year curriculum, or a requirement of at least one year of approved work in an accredited academic college for admission to a four-year curriculum, is now the standard in all of the schools (1925-26),

¹ "Licentiate of Dental Surgery" may be regarded as a professional degree that is coördinate with academic degrees, which historically signify admission to the fellowship of scholars. The rules of several law societies refer to the "degree of Barrister at Law"; for a number of years (1870-95) the New York State Dental Society conferred the degree of "Master of Dental Surgery"; and the American Society of Dental Surgeons used "Doctor of Dental Surgery" as a professional degree before it was awarded by a dental college or a university. "Fellow of the American College of Surgeons" (F.A.C.S.) and "Fellow of the American College of Dentists" (F.A.C.D.), and similar titles that recognize professional distinction, are coördinate with academic degrees and are used as such.

² In Newfoundland and Labrador, where there are no dental schools, dentistry is regulated by law as an independent profession. The Newfoundland Dental Council, consisting of three physicians (M.D.) and three dentists (D.D.S.), is the official licensing board. Of the ten dentists in the colony, six are graduates of American dental schools.

whereas in the United States the latter requirement or the equivalent will not be generally operative as the minimum before 1926-27, although graduation from a high school will then continue to be sufficient for admission to the four-year curricula of the Dental School of the University of California and the proprietary Texas Dental College.

The Canadian universities do not regard dentistry as a branch of the practice of conventional medicine, and do not require prospective dentists to obtain the M.D. degree as a prerequisite for the dental license. Canadian and American universities, in their accord in this fundamental matter, plainly exemplify prevailing professional, social, and economic conditions in the Dominion and in the United States. From the American standpoint, the position of the Canadians is highly significant because, despite their familiarity with the prevailing European system and their freedom to adopt it, they prefer the North American. A Canadian dentist of international repute, summing up, from his extended experience and observations, the "essential differences between the training for the practice of dentistry and the quality of that practice outside of the United States and Canada generally, on one side, and in North America on the other," wrote this memorandum for use in the present study:

"(1) In Great Britain and Europe, generally, dental education has been under the control of medicine. As a consequence, dental students have been taught the medical subjects in medical colleges. This has resulted in a scientific training better than that given in most of the dental colleges in North America. However, in spite of this fact there have been two disadvantages: (a) The work has not been directed toward the practice of dentistry, nor has it been applied directly to the teeth and surrounding tissues; and (b) dental students have frequently been grouped in the class-room with medical students, but have not received the same attention nor has the same grade of work been required of them. (2) There has been a lack of development on the operative and prosthetic side, which has prevented the average practitioner in Europe from giving as good a service in the replacement of lost tooth tissue compared with the average dentist on this side. (3) In Europe, and particularly in Great Britain, there has more recently been a frank recognition of these conditions with the result that to-day the operative and prosthetic side of dentistry is being rapidly developed; and upon the other hand, in North America the teaching of the scientific and medical subjects is being greatly strengthened" (1924-25).¹

The improvements outlined on page 239, by promoting medical comprehension without neglecting mechanical and esthetic essentials, would give to dentistry the merits of both the European and the American systems of training and practice.

¹ One of the leading American dentists, who is also a physician and has had wide experience in Europe, independently recorded his views on this question as follows: "In the medical sciences many of the foreign universities apparently give better instruction to dental students than they receive on the average in this country, but in the technical branches the training in our schools is far superior to that of European schools, primarily because of the lack of opportunity in foreign schools for clinical experience in the finer technical procedures. The foreign dental student lacks opportunity for broad clinical training largely because of medical control of dental education. They overlook the fact that a dentist's knowledge of the medical sciences can, in the main, be practically applied only in proportion to his technical ability. The dental faculties abroad appear to be so subordinate to the medical that they do not succeed in giving the dental student technical training, either in the laboratory or clinic, comparable to that of the schools in the United States and Canada" (1924-25).

B. GENERAL STATUS OF DENTAL PRACTICE

a. Before the creation of the Dominion

The conditions of the practice of dentistry in the Canadian provinces before the creation of the Dominion, in 1867, were similar to those in the United States, as set forth in Chapter II. There were then no dental schools in Canada, and nearly all of the practitioners were trained by the method of apprenticeship, although a few were graduates of dental schools in the United States or of foreign medical schools. As dentistry had not been put under public control in either country, itinerant practitioners were as common in Canada as their varieties in the United States, and the amount of irresponsible practice was relatively the same on both sides of the boundary, varying chiefly with differences in total population and in its distribution.

*b. Since the confederation of the provinces*1. *Statutory regulation*

Efforts to initiate statutory regulation of the practice of dentistry were brought to successful issue in the United States and in Canada simultaneously, and for the same reasons. Although public control of dental practice in the United States was begun by Alabama in 1842, shortly after the graduation of the first class from the first dental school but with doubtful or indifferent success, it did not become a progressive policy until 1868, when, after vigorous agitation of the problem among dentists, dental laws were enacted in Kentucky, New York, and Ohio, in February, April, and May, respectively, of that year. In 1867, representatives of the dental practitioners in Ontario, then numbering about 150, under the leadership of B. W. Day, M.D., L.D.S., of Kingston, realizing with their American colleagues the need for improvement in the public status of the profession and appreciating the importance of organization for that purpose, established the Dental Association of Ontario, the first dental society in Canada. In January, 1868, on the petition and largely through the influence of this Association, and under the Dominion Constitution, which, like that of the United States, permitted the federated units to control such strictly domestic affairs as education, the Legislature of Ontario enacted a law that inaugurated public regulation of the practice of dentistry in the province. Analogous statutes were adopted successively in Quebec (1869), Manitoba (1883), British Columbia (1885), New Brunswick (1890), Northwest Territories (1890), Nova Scotia (1891), Prince Edward Island (1892), and Alberta and Saskatchewan after their creation from the Northwest Territories (1906).

Following British precedent in the incorporation of self-governing guilds, the Ontario "Act Respecting Dentistry" organized all of the dentists then engaged in practice in the province, and subsequently to be admitted thereto, into a corporation named the Royal

College of Dental Surgeons of Ontario, to be managed by a board of directors chosen by the corporation from its own membership for individual terms of two years. The Royal College was empowered, among other responsibilities, to control admissions to the practice of dentistry in the province, and to prescribe the conditions of the preliminary education and of the professional training, to conduct the qualifying examinations, and to issue licenses to practitioners. It was also authorized, at its discretion, to organize and to conduct a dental school independently of a university or in affiliation with one; and was given the duty to interpret and to enforce the dental law. The Royal College is analogous, in the United States, to an incorporated state dental society. The functions of its board of directors include those of an American state board of dental examiners. But the added powers to establish and manage a school of dentistry, and the implied prerogative to exclude other dental schools from the province, gave the Royal College a scope of authority greater than that of any organization of dentists in the United States, which it has consistently exercised with complete fidelity to the public interests, and in a way to reflect great credit upon dentists as public servants and upon dentistry as a profession. The vital difference between the private conduct of a dental school to put money into the pockets of profiteers, and the public management of a dental school to advance the welfare of a people, becomes strikingly evident when the abiding service of the Royal College to dentistry in Canada, since it assumed full control of its School in 1893, is compared with the continuing disservice, to dentistry, of the existing proprietary schools in the United States.

The dental laws in the Canadian provinces, following the example of the Ontario statute, organized all of the dentists into incorporated bodies, designated at present, in British Columbia, Quebec, and Saskatchewan, the College of Dental Surgeons; in Alberta, Manitoba, and Nova Scotia, the Dental Association; and in New Brunswick and Prince Edward Island, the Dental Society. The names of the respective provinces are included. Like the Royal College of Dental Surgeons of Ontario, each of these corporations has a board of directors or council that serves as an executive body, an examining board, and a law enforcement agency; but, although each corporation in Nova Scotia, Ontario, and Quebec has conducted a dental school, none does so any longer. In Alberta the examining board is appointed by the Senate of the University of Alberta. The Dominion Dental Council (page 213) has no powers of regulation.

2. Organizations of practitioners

There are many local dental societies in Canada, especially in the larger centres of population. Besides the incorporated organizations, each province has a voluntary dental association, which is analogous in character and purpose, in the United States, to an unincorporated state dental society. The Canadian Dental Association, the national organization of Dominion dentists, was organized in 1902, holds biennial meetings, and bears

the same general relation to the progress of Canadian dentistry as the American Dental Association to the advancement of the profession in the United States. All of these organizations consider ethical and practical matters of professional concern, promote knowledge of the principles of dentistry, and stimulate interest in dental education.

The Dominion Dental Council of Canada, an unincorporated body having the functions of a national board of dental examiners, was created tentatively in 1902 and permanently organized in 1904. It was established to harmonize professional interests throughout the Dominion; to erect and maintain standards of ethics and education accordingly; to conduct examinations for the determination of professional proficiency; and to issue qualification certificates, on a high standard of capacity, that should facilitate the holder's admission to practise anywhere in the Dominion without being obliged to take a provincial examination. Representatives of the incorporated dental profession in all of the provinces and the Northwest Territories, except British Columbia, were present at the organization of the Council, and all except the delegates from the Province of Quebec entered the agreement. The Council, which is now composed of one delegate from each of seven cooperating provinces, holds professional examinations annually in June and September. Although it is without legal authority, and functions on a voluntary interprovincial agreement, its certificates are now accepted by the boards of examiners in all of the provinces except British Columbia and Quebec. The Council maintains a high ethical position, exerts an elevating professional influence, promotes the advancement of educational standards, and furthers the growth of the fraternal spirit among Canadian dentists. Unlike the Dental Educational Council of America, the Dominion Dental Council does not rate any of the dental schools or publicly classify them, but resembles the National Board of Medical Examiners of the United States in providing reliable certification of individual professional quality in accordance with the legal requirements for a license to practise in the provinces it represents.

C. PROGRESS OF DENTAL EDUCATION

a. Conditions before the establishment of the first permanent Canadian dental school in the Province of Ontario

Before 1867 Canadian dentistry, then wholly unorganized, had neither educational nor professional standards and lacked publications devoted to its advancement. In these respects its status was similar to that of dentistry in the United States thirty years earlier (page 39). In 1867, private apprenticeship for periods ranging from about three months to a year constituted the prevailing mode of preparation for practice, although a small number of dentists, especially among those who were also physicians, had been trained in other countries. A few were graduates of American dental schools, which, including that

established at Harvard University in the same year, were then only nine in number (page 42). In 1869, the Royal College of Dental Surgeons, the incorporated dental profession of Ontario, established a dental school in Toronto, in rented rooms that were equipped for instruction in the dental subjects by its own faculty. Under an arrangement with the Medical College of Victoria University, in Toronto, the students were taught anatomy, chemistry, materia medica, and physiology in that institution. Inasmuch as attendance at a school had not been made a prerequisite for admission to practice, and prospective dentists continued to prefer training by apprenticeship, supplemented in individual cases by private tutoring in special preparation for the license examination, only two students applied for instruction. At the end of the first term, regarding the effort as premature, the Royal College discontinued the School at a financial loss. In 1873, and for a year or two thereafter, formal as well as informal suggestions to universities in the Province of Ontario, concerning the establishment of a dental school, failed to arouse constructive interest.

b. First Canadian dental school

In 1875, J. B. Willmott, D.D.S., and Luke Tesky, M.D., under more favorable prospects, at the request of the Board of Directors of the Royal College of Dental Surgeons of Ontario and under their supervision, supported by an annual grant of one hundred and fifty dollars, successfully organized in Toronto the School of Dentistry of the Royal College of Dental Surgeons of Ontario, which under their management became the first permanent Canadian dental school. Its first group of graduates, eleven in number, received diplomas in 1876. Although from 1875 to 1893, the School was conducted under the jurisdiction of the Royal College, the members of the Faculty received the fees and assumed entire financial responsibility. During this period, however, the School, barely self-supporting, was constantly under the ethical supervision of the Royal College. In 1893, the attendance having mounted to ninety students and the obligations of the incorporated profession having increased accordingly, the School was made an integral part of the Royal College. Thereafter, in a building of its own beginning in 1896, it was conducted wholly by and for the Royal College until July 1, 1925, when, after an affiliation with the University of Toronto since 1888, it became an organic part of the University, to which the Royal College has relinquished all educational prerogatives while continuing to regulate the practice of dentistry and to enforce the provincial dental statute. Not the least of the enlightened acts of the Royal College for the promotion of the dental welfare of the province was its decision, after a long period of affiliation and upon a full plebiscite of the members, to surrender to the University of Toronto, a more appropriate scholastic agency, the active conduct of dental education in Ontario.

In 1875, when the School was founded, there were eleven dental schools in the United

States including the one organized at about the same time in the University of Michigan, each of which gave its graduates the degree of D.D.S. or D.M.D. The act incorporating the Royal College of Dental Surgeons of Ontario did not empower it to grant degrees, nor did it acquire that authority thereafter; but the Royal College has awarded to each graduate of the School, by diploma, the title of Licentiate of Dental Surgery, which conferred the legal right to practise dentistry in Ontario. From 1889 to 1925, under the terms of the affiliation with the University of Toronto, the graduates of the School received also the D.D.S. degree. This School was a member of the National Association of Dental Faculties (of the United States) from 1890 to 1916; participated, in 1893, in the organization of the American School of [Association for] Dental Technics, and remained a member of the "Institutes" that succeeded it; and, in 1923, coöperated in the organization of the American Association of Dental Schools.

c. Succeeding Canadian dental schools

1. Province of Quebec

After the incorporation of the dental profession of the Province of Quebec, in 1869, originally as the provincial Dental Association, candidates for admission to practice, although trained by apprenticeship, were required by the board of examiners to attend a short course of lectures on anatomy, chemistry, and physiology, and to conduct dissections of the head and neck, at the medical school of either Laval University or McGill University, and to stand examination in these subjects. In 1892, after failure to interest Laval University or McGill University in dental education, the Association founded a dental school under the deanship of Dr. W. George Beers, who had been both the leader of the movement to organize the profession in the province and the secretary of the board of examiners from its establishment. About the same time, the University of Bishop's College, at Lennoxville, which had an affiliated Faculty of Medicine in Montreal, began the organization of a Department of Dentistry of that Faculty. In the spring of 1893 the two projects were united, under Parliamentary approval, in the Dental College of the Province of Quebec, which, conducted under the supervision of the board of examiners of the Dental Association and in affiliation with the Medical School of the University of Bishop's College, awarded the degree of D.D.S., beginning in 1893. The act of Parliament that sanctioned this arrangement provided also that the instruction should be given in duplicate sections, one French, the other English, but this bi-lingual plan developed mechanical and financial difficulties that had not been anticipated. The embarrassments becoming cumulative, representatives of the Association in 1903, after a renewal of previous efforts, finally succeeded in inducing Laval University and McGill University to establish French and English dental schools. A provincial statute in that year facilitated the demise of the Dental

College of the Province of Quebec and the creation of a dental school as an integral part of each of these two universities.

In 1903, in accordance with the terms of this understanding, Laval University established a dental school, which in 1921 became the Faculty of Dental Surgery of the University of Montreal. Its first class of two students graduated in 1905. From its inception, this School has been the only one on the Western Hemisphere to issue its annual announcements, give all of its instruction, and award the professional degree (D.C.D.), in French. This School was a member of the National Association of Dental Faculties (of the United States) from 1907, and of the Institute of Dental Pedagogics (later the American Institute of Dental Teachers) from 1909, until their amalgamation, in 1923, into the American Association of Dental Schools, which the School helped to organize.

The associated establishment of the English dental school in McGill University was delayed by a disagreement regarding the nature of the degree to be awarded, the members of the Medical Faculty objecting to recognition of the doctoral form of the professional degree in dentistry. In 1906 the School was opened as a Department of the Medical School, and in 1908 the degree of Master of Dental Surgery was given to its first class of three graduates. There were no graduates in 1909, but thereafter the degree was D.D.S., and there have been graduates annually. In 1919 the School became independent of the Medical Faculty. It was a member of the Institute of Dental Pedagogics, later the American Institute of Dental Teachers, from 1911 until 1923, when it coöperated in the establishment of the American Association of Dental Schools, of which its Dean is President (1925-26).

2. Province of Nova Scotia

In 1907 the Nova Scotia Dental Association was empowered by law to establish a dental school, independently or in affiliation with a university or college. In 1908 the Association founded the Maritime Dental College in affiliation with both Dalhousie University and the Halifax Medical College. Its students received instruction in each of these institutions, and the first class of four students graduated in 1912. In that year the School became an integral part of Dalhousie University. The School was a member of the Institute of Dental Pedagogics, later the American Institute of Dental Teachers, from 1912 to 1923, and in that year coöperated in organizing the American Association of Dental Schools.

3. Province of Alberta

In 1918 the University of Alberta established a Dental Department in the Medical School, and, with three students in attendance, initiated the instruction of a two-year pre-clinical curriculum in dentistry. In 1921, in conformity with increased academic requirements in three of the four other Canadian dental schools, the Alberta curriculum

was lengthened to three years, the first of which consisted of pre-professional work in the Academic College. The graduates of the pre-clinical curriculum at Alberta have been admitted to advanced standing in Canadian and American schools for the work of the last two years. Beginning in 1925-26, the curriculum was extended to include all of the clinical requirements for the D.D.S. degree, which will probably be conferred for the first time in 1927. The Department has been an associate member of the American Association of Dental Schools since its organization in 1923.

d. Number of graduates of Canadian dental schools

The data in Table 1 indicate the number of graduates of each of the Canadian dental schools. The figures, as may be seen at a glance, have been grouped for periods corresponding with the addition or subtraction of dental schools. The first period (1876-92) happens to coincide almost exactly with the years of the Ontario school during which the Faculty assumed the financial responsibility in its management, and the average number of graduates was 17, ranging between 9 in 1885, and 33 in 1890—numbers that were not sufficient to encourage hopes of special financial profit, if any had been entertained.

TABLE 1

TOTAL NUMBER OF GRADUATES OF CANADIAN DENTAL SCHOOLS: 1876-1925

School	1876-92	1893-1903	1904	1905-07	1908-11	1912-24	1925	Total
Toronto (R.C.D.S.) ¹	287	539	59	144	180	1456	106	2771
Quebec (D.C.P.Q.) ²	..	71	..	..	..	..	..	71
Montreal (Laval)	..	..	..	16	42	372	47	477
McGill	..	..	..	..	10	140	38	188
Dalhousie (Maritime)	..	..	..	..	..	75	14	89
Alberta	None: pre-clinical curriculum only, since 1918 ³							
Total	287	610	59	160	232	2043	205	3596
Annual average	17	55	..	53	58	157	..	72
Annual average per school	..	27	..	26	19	39	51	..

e. Organizations for the promotion of dental education

The American Institute of Dental Teachers, during the last twenty years of its history, was, in effect, an association for the promotion of dental teaching in Canada and the United States. The Canadian schools were actively represented in the Institute and some of its annual meetings were held in Canadian cities. Since its decisions were advisory only, it performed a notable service as the equivalent of a national organization for each country concerned. The active membership of the Ontario and Laval schools in the National Association of Dental Faculties of the United States, for prolonged periods, gave

¹ "R.C.D.S.": School of Dentistry, Royal College of Dental Surgeons of Ontario.

² "D.C.P.Q.": College of Dental Surgeons of the Province of Quebec.

³ The clinical years were added in 1925-26.

these two schools unusual opportunity to participate in the proceedings of that administrative body. The Canadian Dental Faculties Association, organized in 1920 and exercising a general advisory influence similar to that of the Dental Faculties Association of American Universities in the United States, afforded annual occasions for the discussion of purely Canadian problems of dental education, which, since the formation of the American Association of Dental Schools, have been considered in informal conferences during the progress of the meetings of that organization.

f. Educational merits of the Canadian dental schools.

Each of the five existing Canadian dental schools was organized by authority of the incorporated dental profession of a province or under the auspices of a university. Proprietary selfishness, which harassed dental education in the United States for many years, never acquired a demoralizing influence in Canada, and all of the schools are integral parts of universities. Lately, the Canadian schools as a group have been more advanced than many of the American schools in the standards of preliminary academic education and in the scope of the professional training. It is also true that, although the best American dental schools retain their international leadership, each of the Canadian schools has always been superior to many of those in the United States. Since 1921, most of the Canadian schools have required the equivalent of at least one year of work in an academic college as a preliminary to professional study, and in respect of time have had a higher standard than a majority of the American schools, although this pre-professional training in Canada generally lacks the educational quality of the year of approved work in an accredited academic college which, during the same period, has been the minimum pre-dental requirement in some of the best schools in the United States. At present, all of the dental curricula in Canada are based upon the equivalent of at least one year of work in an academic college, but McGill requires two academic years, and Montreal three academic years, for admission to the work of a four-year curriculum in dentistry. Beginning in 1927-28, Montreal will require four years. Although at Alberta, Dalhousie, and Toronto, the dental curricula are nominally five years in length, each consists essentially of a one-year academic curriculum combined with a four-year professional curriculum.

In recent years there has been more respect for the medical sciences and less waste of time on excesses of elementary dental technology in the Canadian schools as a group than in many of the schools in the United States. As a consequence, the average graduate of the Canadian schools, at present, has a better comprehension of dentistry as health service than many of his American colleagues of the same year. Although he may be less facile in some of the technical procedures, there is no evidence that, having been taught the mechanical principles, he does not readily and rapidly acquire all of the requisite

manual dexterity as he proceeds with his practice, or that he is less competent than his American confrères to teach himself or to profit from the developments in the sciences and arts, in their application to clinical dentistry. At McGill, where the dental infirmary is the Dental Out-patient Department of the Montreal General Hospital, the dental student has exceptional opportunity to breathe the atmosphere of health service and to study clinical dentistry in its most intimate correlations with clinical medicine. At Dalhousie the relations between medicine and dentistry are close and cordial, the dental students enjoying in the laboratories, hospitals, and clinics the same privileges as the medical students. The new University Health Centre, serving as an out-patient department for all of the surrounding hospitals and housing the Halifax Dispensary and the various city organizations that conduct public-health work, holds school and pre-school clinics under the supervision of whole-time practitioners, which afford excellent opportunities for the study of preventive dentistry, diagnosis, and operative procedure. At Alberta the dental school is, in effect, an administrative department of the Medical School.

Research has not attained the status in Canadian dental schools that the prevailing interest in the medical sciences suggests, and graduate work in dentistry has not yet been inaugurated. Comparatively little attention has been given to courses for the various types of assistants, to advanced courses for practitioners, or to extension teaching, although the Toronto school has made notable advances in these directions. Teaching in dentistry is poorly supported financially, and the dental libraries are neglected. In these respects the situation in Canada is closely similar to that in the United States.

g. Equipment and financial needs

The equipment of the Canadian dental schools closely resembles that of the best American schools in all significant respects. At Alberta, Dalhousie, and McGill the schools are located in medical buildings, and the dental students receive instruction in the medical sciences from members of the faculties of medicine. The school at Toronto has a large building of its own, while that at Montreal occupies all of one building except the lower floor, and both conduct most of the pre-clinical instruction without the assistance of teachers from other faculties. Supply houses are not permitted to conduct retail stores and lounging rooms in any of the schools.

In 1924-25 the estimated value of the land and buildings used primarily for dental education by the five schools in Canada was about \$775,000, an average of \$155,000. The equipment was valued at \$267,635, an average of \$53,527. There was a total debt of \$136,223, an average of \$27,245. The total net value of the property was \$906,412, an average of \$181,282. The total floor area devoted mainly to dental instruction averaged 18,688 sq. ft., which is closely equivalent to that of six rooms 30 ft. by 100 ft. in size. The corresponding figures for the American schools are given on pages 145-146.

The general financial situation in dental education in the Dominion for five successive years is indicated by the data in Table 2. The financial condition of the dental schools individually may be noted in Part VI. The tables in the Appendix present financial items for 1924-25, in an arrangement intended to facilitate direct comparisons. The financial needs of the Canadian dental schools are even greater than those of the American schools. There is no endowment fund for the support of any of them. The attendance of students being smaller than that of the average American school, the income from tuition fees is not so large; and the number of patients, and the fees paid for clinical service, being lower, the income from this source is also less. Teaching salaries are correspondingly inadequate; the libraries, like those in most of the American schools, need extension; and research in dentistry, for lack of funds, is not so active as otherwise it might be.

The Canadian dental schools are no longer self-supporting, but require and have obtained current income in excess of the combined amounts of tuition and service fees

TABLE 2

	DATA SHOWING THE GENERAL FINANCIAL SITUATION OF THE CANADIAN DENTAL SCHOOLS: 1920-25				
	1920-21	1921-22	1922-23	1923-24	1924-25
Current income	\$374,539	\$397,557	\$396,279	\$342,465	\$343,297
Current expenditures	344,462	385,156	387,992	348,937	362,504
Surplus	30,077	12,396	8,287	...	...
Deficit	...	...	...	6,472	19,207
Excess of expenditures over dental income in the university schools, and included in the above total for current income (see Part VI and the Appendix)	45,809	64,355	58,440	86,081	96,111
General net deficit	15,732	51,959	50,133	92,553	115,318
Average net deficit per school	3,146	10,392	10,031	18,511	23,064

TABLE 3

	DATA SHOWING THE NEED FOR CURRENT INCOME IN EXCESS OF THE AMOUNTS PAID IN FEES BY STUDENTS AND PATIENTS: 1920-25 ¹				
	1920-21	1921-22	1922-23	1923-24	1924-25
Total amount of direct appropriations by universities to dental schools, in excess of tuition and infirmary fees and of all other <i>current</i> income	\$45,809	\$64,355	\$62,510	\$86,081	\$96,111
Average amount of the appropriations	11,452	16,089	15,627	21,520	24,028
Number of schools to which these appropriations were made ¹	3	4	3	4	4
Number of university schools which were conducted without a deficit, or at a profit, on the <i>current</i> income from fees	1	None	1	None	None

¹The School of the Royal College of Dental Surgeons of Ontario has been omitted from Table 3 because it was financially independent until it became an integral part of the University of Toronto, on July 1, 1925. The School's financial statement for 1920-24 is given in Part VI; for 1924-25, in the tables in the Appendix.

paid by students and infirmiry patients, respectively (Table 3). Without the aid of endowment, and with temporary decreases in attendance, due largely to the recent elevations of the requirements for admission, the Canadian dental schools have found it necessary to increase some of the fees in order to reduce the amounts of the deficits. The general conditions in this relation, for the schools collectively, may be estimated from the facts recorded in Table 4. The data for the American schools, corresponding with those in Tables 2-4, are given on pages 150 and 151.

TABLE 4

DATA SHOWING THE RELATION BETWEEN ATTENDANCE AND INCOME FROM FEES: 1920-25

	1920-21	1921-22	1922-23	1923-24	1924-25
I. A. Current income from fees:					
Tuition fees (students)	\$245,922	\$218,184	\$203,648	\$173,154	\$140,773
Infirmiry fees (patients)	38,382	62,205	78,882	62,249	55,305
Total	\$284,304	\$280,389	\$282,530	\$235,403	\$196,078
B. Income compared with that for 1920-21, expressed in percentages:					
Tuition fees (students)	100	89	83	70	57
Infirmiry fees (patients)	100	162	206	162	144
II. A. Attendance:					
Students, at the end of the year	1,249	1,239	1,153	877	713
Patients treated in the infirmiries	15,315	17,880	20,523	21,868	20,656
B. Attendance compared with that for 1920-21, expressed in percentages:					
Students	100	99	92	70	57
Patients	100	117	134	143	135

D. IMPORT OF PRESENT DENTAL RELATIONSHIPS BETWEEN CANADA AND AMERICA

In dentistry and dental education the interests of Canada and the United States have become as closely interwoven as the ties of their mutual friendship. Graduates of Canadian dental schools are now teaching and practising dentistry in the United States, and a considerable number of both American and Canadian graduates of dental schools in this country are similarly engaged in Canada. There is cordial reciprocity of ideas, personal visits, and memberships in organizations among dentists of the two countries, and very obvious mutual helpfulness in this exchange. If certain vestiges of international selfishness could be completely removed, so that there might be free trade in all of the utilities for the promotion of health service, the boundary between the two countries, in the professional aspects of dentistry, would be no more distinct than the borderline between Minnesota and Iowa. In 1902 the examining board of the Nova Scotia Dental

Association became a member of the National Association of Dental Examiners (of the United States) and retained that membership until the establishment of the Dominion Dental Council in 1904. For years, the Dental School of the Royal College of Dental Surgeons of Ontario, and those of Montreal, McGill, and Dalhousie Universities, were welcome members of the American Institute of Dental Teachers, and of the organizations that preceded it; and, for long periods, the School of the Royal College of Dental Surgeons of Ontario, and that of the University of Montreal, were active members of the National Association of Dental Faculties (of the United States). In 1921 a section of the International Association for Dental Research, founded in New York, was established in Toronto.

In 1923, before the American Association of Dental Schools was organized, there was a unanimous desire in this country to include in it every Canadian dental school, and the Canadian Dental Faculties Association, having received an invitation to become one of the components of the amalgamation, was equally responsive. The acceptance of the invitation to unite the Canadian Dental Faculties Association with three similar bodies in this country, in the American Association of Dental Schools, was not only a sign of the highest degree of professional cordiality but also an act of the most gracious international amity. Historically, it was an outstanding revelation of the fine quality of altruism that animates the leadership in dental education in Canada, and also an expression of confidence in the goodwill and professional integrity of the teachers of dentistry in the United States. The generous coöperation of the Canadians, and the delight of their colleagues in this country to have it, established new lines of affinity between the two peoples, and added another attachment to the bonds that promise to hold both nations together permanently in warm friendship and in mutual trust, respect, and esteem.

CHAPTER XII

GENERAL VIEWS AND CONCLUSIONS

A. VITAL RELATIONSHIPS OF THE TEETH

THE traditional indifference of physicians to the preservation of the teeth, and to the prevention or cure of dental diseases, has long been an anomaly of the practice of medicine. If normal teeth were merely inert masses of stone, like pieces of marble which they outwardly resemble, or if they were devoid of vital coordinations with the tissues that hold them in place, their neglect by medicine might not be difficult to understand. But they are living parts of an animate human body, perform various important functions, and, from infancy to senility, by becoming deficient or undergoing deterioration, may occasion distress, disability, or death. Normal teeth take their positions in the jaws, in the temporary set and then in the superseding permanent series, through long periods of intermittent discomfort and pain, as if Nature herself, by slow and insistent procedures of construction and alignment, were according them unusual attention and care, and giving to each tooth exceptional preparation for the performance of special duties.

That this figurative allusion is not misleading is shown by the variety and significance of the functions of the teeth. The broadest physiological aspects of the processes of dentition are not indicated by the normal outcome, but are more fully revealed by the consequences of abnormal production or disposition of individual teeth, or of groups or sets of teeth, which include such serious local derangements or general disorders as malformation of the skull, disfigurement of the face, disturbance of the senses, impairment of the influence of the nervous system, and maladjustment of various systemic balances. As initial mechanical factors in nutrition, the teeth are useful preliminary agents for its promotion in every part of the body. Mastication prepares solid masses of food for thorough mixture with saliva, for comfortable swallowing, and for ready digestion, and also facilitates ample production and timely delivery of digestive juices. Comeliness of countenance is enhanced or impaired by the processes that develop the dentition or by the condition of the teeth, and speech or song may be seriously modified by loss or imperfection of individual teeth or by irregularity in their positions and adjustments. The tissues in immediate contact with teeth may become disordered or be destroyed, and the affected teeth detached; and fatal diseases may arise in various parts of the body from infections originating in teeth or in the closely surrounding structures. Measured by the diversity and import of these vital relationships, it would seem to be obvious that a policy of health service, whether in private practice or in public administration, that does not include prevention of the developmental abnormalities of the teeth and jaws, or which ignores oral hygiene, or neglects dental maladies, and then indifferently extracts teeth

when they become deficient, cannot be expected to commend itself to enlightened public opinion. Fortunately this disregard in the medical profession is gradually being replaced by serious attention to oral conditions, especially among the physicians who are engaged in public health-service and among their associates, the public-health nurses and teachers acting in their behalf in the field of public-health information, who are giving an increasing amount of attention to the dissemination of knowledge of oral hygiene and to suitable extensions of dentistry. This desirable movement promises to attain its logical development among practitioners of medicine in general when medical schools give to their students suitable instruction in oral hygiene, and in the correlations between clinical medicine and clinical dentistry, and when dental service is accorded its proper place generally in hospitals and dispensaries.

B. PREVALENCE OF DENTAL AND ORAL DISORDERS

Dental defects and oral abnormalities never have been more prevalent among civilized peoples than they are to-day, and the consequent need for effectual oral health-service never was more urgent. Malformations of the jaws and ailments of the oral tissues are common. The boy or girl whose teeth are entirely free from caries is unusual; and the young man or woman without decayed teeth, or from whom teeth have not been extracted, or who has not had teeth filled, crowned, or replaced, is very hard to find. At middle age, disease of the tissues that surround the teeth is an accustomed experience; in old age, sound natural teeth are uncommon; and at all ages many persons suffer from infectious disorders that follow admission of germs through deficient dental tissues. The teeth are more frequently affected injuriously, more apt to become defective beyond the possibility of successful curative treatment, and more commonly eliminated by surgical intervention, than any other portions of the body.

The occurrence of dental derangements would be distressingly evident everywhere were it not for the achievements of dentistry in retarding the decay and disintegration of individual teeth or in disguising the effects of their loss. No other tissue or organ can be so effectually repaired or so satisfactorily restored by artificial means, both mechanically and functionally, as a tooth or the teeth collectively. Because the enamel is apparently lifeless and the adjacent dentin very nearly inanimate, these exterior portions of a tooth may be removed and artificially replaced without damage to the rest of its structure and without impairment of the vitality or utility of the tooth as restored. These conditions enable dentistry to achieve its distinctive successes in arresting disorganization of teeth, in artistically replacing defective or destroyed dental structure, and in preserving the remainders. Fully-formed teeth do not appear to produce anything that, passing from them, is useful in any other part of the system, and they do not alter their physiological qualities with age or acquire any vicarious responsibilities. Therefore, since the uses of

the teeth are essentially physical, and their masses and relationships comparatively stable, a variety of substitutes for lost teeth may be fitted comfortably and safely, and made not only functionally adequate but also esthetically superior. Such reconstructions now mask dental deficiencies in an increasing proportion of the population.

The most common of the important bodily defects among civilized peoples is dental caries, which, besides causing disintegration of the affected part of a tooth, may, if it proceeds far enough, also occasion serious or fatal systemic infection. Dentistry is remarkably proficient in delaying the progress of decay, when practitioners are visited early enough to enable them to intervene in time. But, despite the great importance of precluding the initiation of dental decay and the passage of microorganisms through the enamel, neither dentistry nor medicine has learned how to prevent the general incidence of caries, or to halt the advance lines of infection through a decayed tooth, or with certainty to destroy all of the organisms at the apex of an infected root, or to restore the health of the tissues about an apex where an infection has occurred. Dentistry and medicine are also unable to obviate the general occurrence of disease in the tissues that surround the roots of teeth and which, after their degeneration, permit bacteria to pass along the surface toward the apical region, and often cause loosening and loss of teeth. The great need for thorough research, to increase the knowledge of prevention and cure and to strengthen oral health-service in these important relationships, is indicated in Chapter IX and in the succeeding section.

C. IMPORTANT DEFICIENCIES OF ORAL HEALTH-SERVICE

a. Uncertainty regarding adequate treatment of dental infections

Owing to the occurrence of contradictory phenomena, the proper treatment of a tooth having an infected pulp and apex presents a series of very perplexing problems. The practice of dentistry and the practice of medicine meet on this common ground, but with conflicting views and contrary procedures. It is believed by physicians generally, and by some dentists also, that a tooth thus affected in any degree is powerless to repel the invading germs, and cannot, by any therapeutic method, be reliably freed therefrom; that the organisms about the apex of a root of such a tooth cannot be destroyed by treatment applied through the root canal; that the unremoved bacteria will continue to be or will become a focus of secondary infection, or a cause of chronic poisoning from products of their activity or from those of the inflammation they induce, and thus may initiate serious or even fatal disease of other parts of the body; and that the only sure way to prevent the development of an impending systemic disturbance is to extract the affected tooth and by suitable supplementary measures to eliminate all of the threatening microorganisms. On the opposite side, it is believed by dentists generally, and by some physicians

also, that infections of a tooth and of the tissues about its roots, *when these tissues have not been destroyed beyond their powers of recuperation*— which it is impossible to predetermine— can usually be completely removed or isolated by suitable operative and therapeutic measures; that as a rule such a tooth, if properly treated, can be rendered non-septic for the rest of the body and restored to usefulness; that its retention after successful treatment does not constitute a menace to the patient's health; and that, under these conditions, if there is no present clinical or roentgenological evidence of injury, extraction of the affected tooth is neither necessary nor desirable to safeguard the welfare of the patient. From every humanitarian point of view it is to be hoped that the more conservative position is wholly correct, but unhappily this disagreement, on a "burning question" in dentistry, is based upon a number of premises on either side that have not been established conclusively by investigation and are rendered more or less dubious by inharmonious clinical evidence.

A few years ago, when oral infection as a cause of disease in distant parts of the body was first given an assured scientific foundation, physicians accepted it eagerly as a possible explanation of many baffling phenomena in their experience, and by free eradication of dental infections sought relief for many of their patients. Unfortunately a large number of physicians, who knew little about dentistry and regarded it disdainfully, themselves undertook to make the diagnosis of oral infection, and peremptorily overruled the judgment of experienced dentists. As a consequence of the confusion resulting from the mistakes of these physicians in their treatment of the dental conditions involved, and from the expressed indignation of many dentists whose experience and understanding had been repudiated, physicians have largely abandoned oral diagnosis. Meanwhile, organized dentistry has failed to conduct the broad, constructive, and judicial research that is necessary for a full solution of this serious practical problem, which, to be successful, requires due recognition of such facts as these:

(a) Dental caries (page 168) and periodontal disease (page 170) open passages for the introduction of bacteria, which commonly destroy the vitality of the pulps ("nerves") in the affected teeth.

(b) The pulp, after its loss of vitality from caries or for any reason— and often before— tends to acquire an infection, which soon extends into the tissue surrounding the apex of the root. This "periapical focus of infection" may or may not cause pain, but its presence can usually be determined.

(c) Diseases of the gums, which as a rule are complicated by infection, run a progressive course, along the root toward the apex.

(d) The infections noted in (b) and (c), which constitute by far the greater number in the mouth, are similar in their essential characteristics to primary infections that occur elsewhere in the body and have analogous secondary effects upon the system.

(e) Extra-oral infections similar to those in the mouth frequently occur in the alimen-

tary canal and in its related parts, such as the appendix and gall bladder; also in the middle ear, nasopharynx, paranasal sinuses, respiratory tract, tonsils, uro-genital passages, and other parts.

(*f*) Individuals suffering from certain common disorders, such as anemia, arthritis, endocarditis, iritis, malnutrition, myositis, nephritis, neuritis, etc., frequently, although not always, have one or more demonstrable causative or contributive "foci of infection," of which those about teeth are among the most common.

(*g*) In a large percentage of such maladies (*f*), complete removal of all existing foci of infection results in improvement or cure; but in many instances the ailments are due to other causes, or complicated by them, and therefore the removal of such foci may have little or no observable remedial effect.

(*h*) Experimental injection, into animals, of cultures of bacteria recovered from foci of infection in these cases (*g*) has resulted in the development of disturbances similar to those suffered by the corresponding patients, which some investigators have regarded as direct proof of a causal relationship between the primary foci of infection and the secondary diseases. But the validity of this evidence has been questioned by others, who have not been able to duplicate the results.

(*i*) It is a common observation that many individuals plainly harbor foci of infection, yet exhibit no other discoverable evidence of disease. This tolerance, although mystically ascribed to "immunity," has not been explained, nor has it been possible to determine, in any patient, when this resistance is about to be diminished or lost, or whether it will continue permanently unimpaired, and why.

(*j*) Convincing evidence that infection of the dental and periodontal tissues can commonly be eliminated, and that the treated tissues are not specially susceptible to reinfection, has not yet been presented; and it is not certain that infected teeth can usually be restored to a healthy condition and retained to the ultimate advantage of the patient.

Removal of the ignorance and uncertainty that encourage the differences of opinion noted above is a task that is worthy of the united efforts of able representatives of dentistry and of medicine. Thorough and complete basic enquiry in this field, through cordial coöperation of qualified investigators, with intent solely to ascertain the whole truth, is one of the most urgent needs of clinical dentistry and of oral medicine. Until the results of research establish the enduring foundations for the treatment of dental infections that will enable dentistry and medicine to agree on both facts and procedures, dentists and physicians cannot render scientific service in this important aspect of their duty, and dental teachers must remain uncertain regarding essential features of their instruction. In this situation, tragic in its possibilities for many individuals, the serious predicament of the laity should appeal strongly to persons who are able and inclined to endow research for the promotion of health service. Thorough study of this problem under favorable conditions, while humanity awaits the discovery of means to prevent dental infections, promises to

yield results of immediate importance for the relief of thousands in whom infected teeth are objects of present doubt or concern, or are possible causes of progressive or impending systemic disease.

The penetrating researches that are greatly needed in this field of urgent remedial practice, and which could be accomplished most successfully by sympathetic coöperation between workers in associated dental and medical schools in universities having adequate dispensary and hospital facilities, might advantageously be coördinated through enquiry along such avenues as these:¹

(1) Histo-pathological study of all of the morphological changes that occur in oral tissues through the influence of infection.

(2) Analysis of the efficacy of the various current methods for the growth and detection of microörganisms in oral foci of infection.

(3) Development of such additional media and procedures as may be necessary for the cultivation and isolation of microörganisms that occur in the mouth but which cannot be identified by available methods.

(4) Detection, by the use of improved procedures, of the presence or absence of infection in various suspected regions of the mouth.

(5) Recovery of bacteria from secondary foci, to ascertain whether the organisms belong to the variety found in primary dental foci of the same individual.

(6) Animal experimentation, fully controlled, to discover whether bacteria from primary foci of dental disease are able to produce the same disorder in the subjects of the experiments; and, distinguishing such conditions from those attending actual dental focal infection, a complete reëxamination of the foundations of the theory of "elective localization" as related to oral infection.

(7) Establishment of the relationships between primary and secondary infections by statistical studies of the results obtained in the treatment of secondary disease through the elimination of primary foci, with special reference to oral infections.

(8) Studies, including an examination of hereditary relationships, to determine the nature of the "resistance" observed in many individuals, so that when tolerance to established primary oral infection can be explained, artificial protection may possibly be provided.

(9) Selection, by differential study, of the most reliable treatments of periapical infections to ensure the safe retention of the affected teeth, without disregard for the fact that the *mere presence* of bacteria that persist after treatment cannot be evidence that the organisms will *certainly* exercise injurious influence, although that *possibility* is implicit in the finding. It is particularly desirable to raise the study of this aspect of the problem to a plane that would put it beyond the reach of partisans of standing commitments, and of the patentees and producers of therapeutic articles now on the market.

¹ These problems of research, like those suggested on pages 167-175, are intended to serve as illustrations only, and do not present a complete program.

(10) Reconsideration of the criteria for justifiable extraction of a tooth, where there is periapical infection and destruction of a portion of the pericementum, with special reference to the capacity of the pericementum — on which the physiological stability of the tooth in the socket depends — to repair its losses and to protect the tooth after the most suitable treatment.

(11) Reinvestigation of the validity of roentgenographic procedures for the detection of oral infections and for the assurance of restoration of healthy conditions after treatment, including specifications of all of the sources and limits of error in the roentgenographic indications.

(12) Reëxamination of the findings on alterations in the character and composition of the blood in patients having focal infections, to determine the validity of current claims that certain changes afford reliable differential diagnostic criteria.

(13) Devisal of reliable tests for the detection of latent susceptibility or hypersensitiveness to dental focal infections.

(14) Determination of the effects of diseases, unhealthy environment, fatigue, malnutrition, abnormal mental states, unusual occupation, pregnancy, etc., on the resistance to secondary ailments that are sequelae of primary dental focal infections.

(15) Invention of simple and reliable ways to detect early signs of the conveyance of microorganisms in lymph and blood to remote parts ("metastatic infection"), and also to distinguish initial symptoms of the absorption of bacterial toxins or of the inflammatory products caused by the local action of microorganisms ("chronic intoxication").

Large financial resources, for the study of these and related problems, if made available through a term of years to an earnest, capable, and coöperative group of dentists, physicians, and trained investigators in the medical sciences, in a leading university, would be potentially one of the most useful benefactions that might be offered to afflicted humanity. Here, of all places on the borderline between dentistry and medicine, in diagnosis and treatment, the need for close coöperation between dentists and physicians is most obvious. To the intelligent layman there appears to be an inherent failure when a physician, without the guidance of expert dental opinion, orders extraction of infected teeth; or when a dentist, without dependence upon the judgment of a physician, retains an infected tooth in a patient showing symptoms of any of the diseases that sometimes result from dental focal infection. No other field in dentistry has been more completely overrun by the pretentious, the gullible, and the ignorant, and none is more in need of accurate and balanced research by experienced and clear-sighted students of pathological problems, who, conscientious and dependable, would state fearlessly the facts discovered in a comprehensive enquiry, under conditions of publication that would not shield influential advertisers of worthless or harmful therapeutic products.

b. Failure in prevention of dental disorders

No physical defects are so common in children as those of the teeth. The greatest concern of the dentist in private practice should be the oral health of the largest number of children he might be able to serve. Adequate oral health-service during early childhood may be expected to assure the largest measure of enduring dental health thereafter, yet dentists as a body, with many notable exceptions, have not realized their social and professional obligations to make preventive dentistry for children, by both advisory and operative means, the fundamental purpose of dental practice. Fortunately, however, while dentists awaken to their responsibilities in this regard, oral health-service for children is being gradually extended under public auspices. Although as yet there are comparatively few communities in which public dental work is being done for children, it seems certain, from current demonstrations of the great usefulness of this service, that every well-organized public agency for the supervision of the health of children will soon include "public-health dentistry" in its program. The usefulness of the dental hygienist in this field is indicated in Chapter IV; the urgency of oral health-service for children is considered on pages 79 and 84; and the need for operative intervention, in children's teeth, to prevent initiation or extension of decay, is mentioned on page 166 ("prophylactic odontotomy"). But appreciation of the immediate importance and value of direct corrective measures should not be permitted to disguise the causes of unfavorable biological variations in dentition nor to minimize concern about the earliest possible discovery of all of the conditions of normal dental development and of the causes of its perversion, so that true prevention may be ultimately achieved, if it is not inherently unattainable.

Heretofore the practice of dentistry, exclusive of cleansing and extraction, has consisted chiefly of realignment of teeth, arrest of processes of dental decay and repair of the damages, treatment of dental and periodontal infections, replacement of the main parts of lost teeth, and surgical operations on the jaws and oral tissues. All of these procedures are effectual for the maintenance of the dental functions, and each is an important phase of grateful service for the protection, comfort, and contentment of the patient. Although dentistry has been endeavoring, also, to devise ways and means to prevent dental and oral abnormalities, little has been accomplished beyond the improvement of time-honored methods of cleaning teeth; the application of corrective measures to remove infections and defects or to delay the development of disorders; and extension of the common knowledge that teeth and jaws cannot grow normally in embryo or in childhood, and the surrounding tissues cannot be kept healthy after maturity, on a diet that is insufficient to maintain normal general nutrition. The new information on these aspects of oral hygiene has increased dentistry's ability to postpone the occurrence or to retard the progress of various dental and oral deficiencies, but the goal of true prevention

has not been attained, for these maladies frequently occur in mouths that receive special hygienic and operative attention and in persons whose diet keeps them well nourished.

Over-emphasis on the ideas that "a clean tooth will not decay," and that "a proper diet will ensure perfect teeth" — two very important factors, but not the only essentials in the preventive control of dental and oral abnormalities — has been tending lately to develop illusory views on the nature of the main problems awaiting solution. When, at a given point, a tooth is inherently defective or is abnormally disposed in a manner or to an extent that favors special local action of the ubiquitous microorganisms, and the tooth at that place is thoroughly scrubbed several times a day with dentifrice and brush in the customary manner, requiring even for the most fastidious less than a total of five minutes for any one location, then, however thorough the cleansing operation may be, closure of the mouth and adjustment of the oral parts to their usual contacts ensure immediate return of myriads of active organisms to that surface. Under such conditions, thorough washing of that particular spot could hardly do more than intermittently retard a destructive process that would be bound to continue there to some extent during the remaining twenty-three hours and fifty-five minutes of the day. At a definite position, after microorganisms pass slightly beneath the plane of the enamel surface into the channels there open to their advance, cleansing of the tooth on that area, with brush and dentifrice or other devices in the usual way, cannot dislodge all of the most dangerously situated individual organisms, however smooth the surface over them might seem, or however clean and polished it might appear; and the process of decay would go on there with little or no interruption. There is no known hygienic way to destroy all of the microorganisms in the oral cavity at any time or to prevent the immediate return of myriads of them from the outside; and in any protecting harbors in the mouth, where such organisms grow rapidly in the presence of retained particles or solutions of food, they tend promptly to induce destructive fermentation. Therefore, brushing the teeth is analogous in its sanitary effect to that of bathing the body. These cleansing processes are very desirable for a variety of important hygienic reasons, but neither prevents the development of disorders caused by microorganisms that cannot thus be removed, or that readily regain access to favorable positions during the intervals between the cleansing operations.

To some it appears that ingestion of ample quantities of a balanced diet automatically brings about the production and maintenance of perfect teeth and thereby the prevention of oral abnormality. But there is no evidence to show that a perfect tooth will not decay under oral conditions that favor special bacterial attack upon it, or that ingestion of good food in proper kinds and in sufficient amounts throughout the whole of the period of growth ensures normal formation of anything. Supplies of food, when eaten, are merely subservient units of construction in coördinated processes of building and repair. It is a matter of common observation, to illustrate familiar anomalies, that of two children in a family subsisting on practically the same adequate diet, and eating enough

of each kind of food needed for normal development, one child may grow rapidly and have a large skeleton and excellent teeth, while the other may grow slowly and have a small frame and poor teeth. If good food in the requisite proportions were the only physiological desideratum, such differences among well-fed children would not occur. No one assumes that the way to erect a building is to dig a basement and then unload into it, helter-skelter, all of the stone, brick, mortar, steel, and other necessary materials, in the expectation that these things will put themselves in order. The building rises only when it is erected by workers laboring, more or less faithfully, under directions for the consummation of a plan. When at least the minimum amount of each kind of essential material is available, the building acquires a size, shape, and stability that are dependent upon the coördinating influences and upon the responses of the workers. In the search for the secrets of prevention of dental diseases the actual conditions pertaining to cleanliness and food—to methods of cleaning the teeth, and to dietetics from the dental standpoint—cannot be too fully elaborated or too sharply detailed. But, in the quest for additional knowledge in these very obvious phases of the problem, more profound relationships and more elusive facts should not lack the attention that their paramount importance suggests. Thus, physiological coördinations between glandular activities or nervous influences and dentition, which are involved in the development of the teeth and jaws and in the secretion of oral fluids, on variable plans in different individuals, constitute a field where, it seems certain, important discovery awaits research by intimate application of the medical sciences to the needs of dental practice. Here again it is accordingly probable that results of fundamental significance in the effort to prevent disease will be forthcoming as soon as effectual collaboration between able investigators in associated medical and dental schools can be effected.

D. MAIN REQUIREMENTS FOR THE IMPROVEMENT OF ORAL HEALTH-SERVICE

a. Practice

The keys to progress in dentistry are the practitioner who serves the patient directly, the teacher who instructs and trains the practitioner, and the investigator who extends the knowledge on which the teaching and most of the improvements in practice depend.

Lately the number of dentists has been growing more rapidly than the general population, but it is far from adequate and the distribution is very irregular (pages 83-87). The organized dental profession, and also the universities and dental schools, are doing practically nothing to promote more uniform distribution. The number of licensed practitioners from foreign countries is very small. Current elevations of educational requirements may decrease the number of graduates during the next few years. The early creation of loan funds for the assistance of dental students would favor continued increase

in the number of dentists until the supply fully met the demand. The American College of Dentists is developing a plan intended to promote the public welfare in this manner.

Dental practice has been very progressive in the technical procedures of repair, restoration, and replacement, but has been backward in the biological responsibilities of prevention and therapeutics, which cannot be fully met by dentistry until, based on an adequate system of education that will also support and stimulate the best teaching and research, it becomes the full service equivalent of an oral specialty of the practice of medicine. In attaining its remarkable mechanical and esthetic successes, dentistry developed aptitudes and interests which, by focusing concern primarily upon procedures of reparation, distracted attention from its greatest opportunities in health service. The average dental practitioner, having had a poor education in the integration of the medical sciences with clinical dentistry, finds it difficult to apply them in his practice, and to keep himself informed as to the main features of their growth and further correlation. Few dentists have had the type of education that develops capacity and inclination for the serious and continual study of scientific literature, which the progressive practice of a profession requires. As a consequence many use antiquated methods of practice, or they uncritically or casually adopt new procedures that appeal empirically, or have nothing to commend them beyond persuasive demonstrations by salesmen or plausible advertisements by manufacturers. In accordance with these evidences of lack of the true professional spirit or of the understanding that a liberal education begets, a large number of dental practitioners use various patented therapeutic products regarding the true nature and properties of which they know little or nothing, and to this extent practise superficially and unprofessionally. The *Journal of the American Dental Association*, which represents the organized dental profession in the United States, has been helping to maintain these conditions by publishing advertisements of such products.

In discussing the prevailing critical attitude of medicine toward dentistry, physicians whose judgment is accorded universal respect often justify their want of confidence in individual dentists, and in certain relationships of organized dentistry, by pointing out not only that dental practitioners freely use patented therapeutic products of doubtful value, but also permit manufacturers to finance many professional projects; make important meetings of practitioners adjuncts to commercial exhibits; encourage the continuance of a system of supply-house journalism that is so obviously mercenary that sometimes its issues cannot be distributed in the mails at the reduced postal rates accorded to professional literature; elect to positions of honor, in professional organizations, beneficiaries of the sale of patented therapeutic products, stockholders of proprietary dental schools, editors of "house organs," and other industrial emissaries; and in sundry ways seem to proclaim unabashed that they regard dentistry as a trade and a business rather than as a profession. So long as large numbers of dentists show such partialities or indifference to commercialism in their professional affairs, it will be impossible

for medicine and dentistry to attain that accord and coöperation which the highest development of oral health-service requires, and which must be based on the mutual respect of the main bodies of their practitioners. Fortunately, among dentists themselves strong discontent with mercenary domination of organized dentistry is growing apace; and the prospective elevation of dental education to a plane of equality with that of medicine, with its collateral tendencies to reduce the proportion of the professionally unfit, to heighten the self-respect of the practitioner, and to stimulate the growth of ideals of service, promises an early end of the commercial régime.

Although these deficiencies of dental practice retard its evolution, and despite the fact that dentistry has not yet attained marked success in prevention or in the application of the medical sciences, it is true, nevertheless, that for many years dentists have systematically encouraged their patients to submit to periodic precautionary examinations for the diagnosis and treatment of dental disorders in their incipiency, and for the application of direct measures of oral hygiene. The importance of this procedure for children, in whom most dental abnormalities and diseases may be arrested, cured, or corrected, cannot be overestimated. These efforts by the dental practitioner, to discover promptly the incidence of oral maladies and to prevent their extension in his patients individually, exemplifies an ideal of health service — to keep people well — which has not yet appealed strongly to the average practitioner of medicine, who, manifesting little concern about prevention of illness among his private patients, seldom gives them personal advisory health-service when they are not sick. This notable difference between the direct efforts of dentists and physicians, in which dentists have set a useful example by endeavoring to convert a passive aspect of health service into an active phase, suggests an opportunity for marked improvement of medical practice in harmony with the popular expectations that are being developed by progressive public education for the conservation of health, in which lay agencies and medicine, dentistry, and nursing are actively participating.

The frequency of the periodic examinations gives dentists exceptional opportunity to note early signs of many types of illness outside of the domain of dentistry, and by advisory health-service to help their sick patients promptly to obtain suitable medical attention. This situation, in which the dentist might more actively coöperate with physicians for the welfare of his patients, emphasizes the desirability of improvement in the instruction of dental students in the medical sciences and in the correlations between clinical dentistry and clinical medicine.

Dental practice relates inherently and intimately to the individual patient, and, with occasional exceptions, can be conducted entirely in the office of the dentist, requiring neither visits to the home of the patient, nor treatment in a hospital or dispensary. This condition accentuates the importance of the clinical practice in the infirmary of the dental school, where the conditions of the student's chair-side experience closely approximate those of his prospective private practice, which is rarely the case for the medical student

in the medical school or in the hospital. In a general way the efforts of public-health officers and various other agencies, lay and professional including dentistry, to prevent dental diseases, are analogous to similar activity for the control of communicable diseases, although thus far they have had little effect on the quality of dental practice. The psychological features of oral health-service, especially in the treatment of children, and also the social and economic relationships—and their sympathetic comprehension by the practitioner—have not been receiving the attention in dental schools they require, but a broader preparatory education will facilitate their more effective development.

b. Education

The proper training of the practitioner is a matter of prime importance. That he should be an educated man, with a background of culture and refinement, is quite as essential for the dentist as for the physician. That his professional training should give him a true medical comprehension of his duties, as well as mechanical facility and esthetic felicity in the execution of his procedures, is equally obvious. In educational quality and influence, dental schools should equal medical schools, for their responsibilities are similar and their tasks are analogous. The dental graduate should be the peer of the medical graduate in all important personal attributes, and in professional capability. Dental faculties should show the need in medical schools for integrated instruction in the general principles of clinical dentistry and in its correlations with clinical medicine, and should also cooperate in teaching stomatology to medical students and in conducting effectual dental service in the hospitals and dispensaries. Proprietary dental schools are about to become extinct, and non-proprietary-independent dental schools are no longer able to meet the most important educational obligations resting upon them. The early union of these schools with universities, or their discontinuance, is clearly foreshadowed.

Everywhere education is chiefly what the teacher makes it. The most important immediate need in all of the dental schools is a much larger proportion of able and inspiring whole-time teachers, who, devoting their lives to teaching as a profession, by their character and example would exalt the spirit of dentistry, by their conduct of the instruction would heighten the quality of oral health-service, by their research would steadily extend the boundaries of dental knowledge, and by their scholarship would give to dentistry and to dental education the intellectual distinction now lacking in each. All desirable early improvements in dental education would follow their advent. In order to strengthen dental education at the point of its greatest weakness, funds sufficient to enable the schools to pay adequate salaries must be provided, and suitable means must be devised for the selection and training of the most competent prospective teachers and investigators. Fellowships and special funds are needed to encourage and support advanced study and research by the most promising candidates for whole-time teaching positions.

c. Research

Most of the research in dentistry has been conducted under commercial influences, and relatively little has been attempted in dental schools or universities. Large sums have been expended on the invention and improvement of valuable dental goods, but practically no funds have been forthcoming for the promotion of research relating to the welfare of the teeth and mouth and to the health of the whole person as it is affected by oral conditions. Compared with the activity in original investigation in medical schools, research in dental schools is weak and uninspired. The secrets of the means for the prevention of dental and oral abnormalities may remain hidden indefinitely unless dental schools actively institute a search for them, and find the means and obtain the resources with which to promote adequate investigation. Many of the universities have been indifferent to this situation because dental faculties, interested chiefly in private practice, have failed to show the urgency of biological research for the promotion of dentistry.

The spirit of enquiry should animate the teaching of dentistry, and should be exemplified in the service of the practitioner; but, as a rule, fundamental research can be conducted with success only by those who are fitted by nature and by training to advance it, and whose abilities have been matured under the guidance of competent teachers. Worthy motives, ardent desires, keen aspiration to serve, and ready imagination, are not sufficient resources for the conduct of an important investigation. Without logical plans, accurate methods, careful controls, balanced observations, patient repetitions, rigorous skepticism, intellectual integrity and independence, and judicial discrimination and decision, research becomes a make-believe of unwarranted inferences and unsupported speculations, however attractively or persuasively it may be dressed up. The prevailing uncritical acceptance of the pretensions of such research in dentistry will come to an end when dentists receive the kind of education that will fortify their minds against it, and that will enable them to form a reasonably sound judgment as to the quality of any published research on a dental subject.

E. PUBLIC RESPONSIBILITY FOR FURTHER DEVELOPMENT OF DENTISTRY

In some states and provinces in North America public resources are used to provide dental service and to promote the education of practitioners, but most communities leave to individuals or to institutions the opportunity and the obligation to advance dentistry, which heretofore has been promoted mainly with funds supplied by dentists themselves or taken from profits in commercial dental enterprises. The public, the main beneficiary, has given little attention to the possibilities of improved oral health-service, and does not seem to realize that the universities are greatly in need of permanent resources for the furtherance of dental research. It is essential that the development of dentistry be projected through far-reaching enquiry in the field of prevention, yet important progress will

be impossible without adequate financial support. The opportunities for disinterested public service through the furtherance of dentistry, for the betterment of the health of individuals and communities, are exceptional.

F. GENERAL CONCLUSIONS

The present enquiry, although not a technical study of dental practice but an effort to present essential facts and opinions that might be useful in improving the conditions of education and of licensure in dentistry, appears to have justified the foregoing views and also the following general conclusions:

Dentistry is an important division of health service relating directly to the teeth and closely adjacent oral tissues, and indirectly to other parts of the body, to the organism in general, and to the transmission and prevalence of some communicable diseases.¹

Dentistry, in the quality and efficiency of its service to the patient, should be made the full equivalent of an oral specialty of the practice of medicine.

The unusual mechanical and esthetic demands upon dentistry have fully justified and continue to require its active development as a separately organized profession.

The long continued indifference of medicine to the development of dentistry, and to the treatment of the abnormalities and diseases of the teeth and oral tissues, suggests that if dentistry were called stomatology, and included in the practice of conventional medicine, the mechanical and esthetic factors of oral health-service would not attain their most desirable improvement and development.

The success with which dentists have brought dentistry to its present state of usefulness, appreciation, and opportunity, against persistent belittlement as "merely a mechanical art," and the strength of the evolution of its scope and function now plainly in progress, indicate unmistakably that the leadership of the dental profession is advancing dentistry toward its full possibilities in health service.

Dentistry can be effectually and economically developed to the full service equivalence of an oral specialty of the practice of medicine through extension and improvement, in universities, of that system of dental education which, though separate from medical education, is closely related to it and should be more intimately associated with medical schools, hospitals, and dispensaries.

This extension and improvement could be accomplished without requiring the prospective general practitioner of dentistry to become a doctor of medicine before beginning his dental training, and could best be brought about by pursuit of the following three main objectives: (a) the preliminary education and the instruction in the medical

¹ Throughout this Bulletin "health service" is used in its natural sense to signify any and all private and public means to maintain or to promote health, to prevent disease, to restore health by treatment and cure of sickness, and to alleviate the discomfort, distress, and disability of incurable ill-health. Public-health administration, education for the prevention of disease, medicine, dentistry, nursing, and pharmacy are important divisions of health service.

sciences should be practically the same in general scope and quality as for medicine; (b) the technical and clinical training, the applications of the medical sciences, and the correlations of clinical dentistry with clinical medicine should be sufficient to assure both ability to initiate safely a dependable modern general practice of dentistry and capacity to grow in proficiency; and (c) the most advanced phases of dental practice should be reserved for systematic graduate study.

These three objectives could be attained through the requirement of at least (a) two years of approved preparatory work in an accredited academic college, including several extra courses that would stimulate interest and develop ability in the prospective practice of dentistry, or reveal ineptitude, (b) and three years of intensive and well-integrated effort in an undergraduate dental curriculum for the training of general practitioners only, the years to be lengthened by beginning them with summer sessions, or otherwise, wherever the time equivalent of four professional years of conventional length is regarded as essential; followed by (c) optional supplementary full-year graduate curricula for advanced training, during one or more years, in all types of dental and oral specialization. The suggested lengthening of the dental years, which might be accomplished by their subdivision into "quarters" in the conventional manner, would prevent long interruptions in the dental training besides adding a year to the practitioner's career in practice. Loan funds could be used to aid students in need of financial assistance.

Such a reorganization, by its selective character in the preparatory education, by its establishment of broad health-service objectives, and by its placement of the oral specialties on a graduate basis, would raise dentistry to intellectual equality with medicine, and would give physicians and dentists analogous types of professional training. It would develop similar capabilities in medical comprehension, ensure mutual respect and understanding, and facilitate intimate cooperation in the promotion of the welfare of patients.

This general improvement in dental education would involve reconstruction of the dental curriculum, with special reference to important betterment of the teaching in all of its aspects; economy of time without impairment of the efficiency of the instruction in the medico-dental sciences, in dental technology, and in clinical dentistry; more useful application of the medical and technical sciences; and more advantageous correlation of clinical dentistry with clinical medicine.

The proposed regeneration of dental education would necessitate, in practically all of the dental schools, an increase in the number of well-trained, whole-time teachers, especially in the dental subjects; and also great improvement of the libraries, and active advancement of research.

The dental schools in this country and in Canada, lacking endowments and in most cases being obliged to keep the quality of their work to the level of their income from fees, will be unable to proceed with the suggested improvements unless, individually, they receive large gifts of funds for the purpose.

G. ACKNOWLEDGMENTS

Assistance throughout the present study has been given whole-heartedly and abundantly by so many persons and organizations, that the writer, in acknowledging the Foundation's indebtedness and also in publicly expressing personal appreciation, is deeply embarrassed by his inability to indicate the very large participation of those who have coöperated.

In 1921, when the study was begun, at the request of a number of organizations in the field, there were wide and serious disagreements among the dental faculties in the United States regarding the proper conduct of dental education. Notwithstanding these unsettled conditions, however, the dean and faculty of each dental school in this country and in Canada gave generous aid from the beginning, fully four hundred dental teachers having actively coöperated. The deans particularly, by their unselfishness in permitting close examination of their records, in responding orally and by protracted correspondence to very many direct questions, in correcting the manuscripts and printer's proofs of the statistical statements affecting their schools, and by their cheerful willingness to accept the consequences of a judicial enquiry without reference to their partialities, have provided the solid basis of facts on which this Report is founded, and which constitute the substance of Part VI and the Appendix. The study has also been furthered by very helpful advice received from a large number of teachers in medical schools, experienced students of education, members of state boards of examiners, officers of hospitals, and members of boards of health, who responded cordially to all requests for counsel.

Equally gracious in their assistance have been many dental organizations and their officers, in Canada and in the United States, especially the Canadian Association of Dental Faculties, the Dominion Dental Council, the American Academy of Periodontology, the American Dental Association, the American College of Dentists, the National Association of Dental Examiners, the American Institute of Dental Teachers, the National Association of Dental Faculties, the Dental Faculties Association of American Universities, the American Association of Dental Schools, and the Dental Educational Council of America. Since 1921 it has been the writer's privilege to attend the meetings of most of these bodies and there to discuss, formally and informally, many matters of importance in the work.

Historical data have been drawn freely from many well-known books, those by Koch and by Taylor among them; also from various periodicals, special records such as the forty volumes of the *Proceedings of the National Association of Dental Faculties*, and numerous original sources of information including private correspondence with participants in significant events. In the compilation of the data in Chapter XI, on dental education in Canada, generous coöperation was received from Wallace Seccombe, D.D.S., Dean of the Dental School of the University of Toronto, and Secretary of the Canadian

Dental Faculties Association when in 1923 it was amalgamated in the American Association of Dental Schools. A page proof of the comment on statutes and legal restrictions in Chapters III and VI has received the critical examination of Mr. Leslie M. Childs, Attorney and Counselor at Law, of Greenfield, Indiana, author of *Law for the Dentist* and of other important publications on dental jurisprudence and in additional legal relationships. Chapter V was prepared with the help of Negro dentists, chief among whom was Stephen J. Lewis, D.D.S., Editor of the Dental Section of the *Journal of the National Medical Association*, who has carefully reviewed the chapter at various stages in its preparation. The assistance of Mr. W. M. Steuart, Director of the United States Census and of Mr. R. H. Coats, Dominion Statistician, is more directly acknowledged on page 245.

The general conclusion that dentistry is a division of health service which, although continued as a separately organized profession, should be made the service equivalent of an oral specialty of the practice of medicine, was included in the dental section of the Annual Report of the President of the Carnegie Foundation for 1923; and the general outlines of the Introduction and of Chapter XII of this Bulletin were published in the dental sections of the Annual Reports for 1924 and 1925, respectively.

Outstanding in its influence for the furtherance of the study has been the direct and unstinted coöperation of the Dental Educational Council of America, which actively encouraged united assistance by all in the United States whose interests were most directly affected. The writer, invited to attend continuously each of the Council's sessions since 1921 and privileged to hear all of the discussions (1922-25), has thus been accorded exceptional opportunity to see clearly many of the special conditions in dental education in America. During the academic year 1921-22, when each of the dental schools in the United States and in Canada was visited at least once, nearly all of the members of the Council, in many special committees of two to four members, accompanying the writer, gave freely of their time and attention to the observations at each school in both countries, and from their wide experience and detailed knowledge made weighty contributions to an understanding of the situation. Throughout the study, the devoted and able Secretary of the Council, Albert L. Midgley, D.M.D., Sc.D., of Providence, Rhode Island, a member of the Rhode Island State Board of Dental Examiners and Secretary of the American College of Dentists, not only aided in the inspection of schools, but also presented the Council's historical and current records for prolonged study, helped freely to assemble significant data, gave wise counsel on many matters of fact and procedure, read critically the entire manuscript and at least two printer's proofs of the whole Bulletin, and at every stage of the study gave himself unreservedly to its progress.

DENTAL SCHOOLS IN THE UNITED STATES AND CANADA

DATA ARRANGED IN THE ALPHABETIC ORDER OF THE NAMES OF THE
STATES AND PROVINCES

INTRODUCTION

A. MAIN SOURCES OF THE INFORMATION

EACH school was visited during the academic year 1921-22, and most of them several times during the succeeding years 1922-26. The approximate dates of the visits are indicated.¹ Throughout the progress of the study, officers of the schools coöperated generously, and provided most of the data in Part VI. The present writer, in attendance at many of the meetings of national organizations of dentists since 1921, frequently participated in the discussions; and at associated conferences consulted dental teachers and executives on matters pertinent to the study. Since August, 1921, he has been privileged to attend all of the meetings of the Dental Educational Council of America, and also to examine the Council's records (page 242).

Populations in the United States are given as of January 1, 1925; in Canada, as of June 1, 1925. Unless otherwise noted, the data represent estimates by the United States Census Bureau, or the Dominion Bureau of Statistics, through the courtesy of Mr. W. M. Steuart, Director of the United States Census, and Mr. R. H. Coats, Dominion Statistician. The figures for dentists and for physicians indicate the numbers approximately as of the dates for the corresponding populations, and, when not accredited to other sources, were taken from the *Medical Directory* issued in 1925 by the American Medical Association, or from the *Dental Register* published in the same year by Polk & Company. The numbers of dental clinics or infirmaries were given by the deans of dental schools; those of hospitals and similar institutions were obtained from the *Medical Directory*. The summaries of statutory requirements have been compiled, in the main, from the "Laws" issued in 1925 by the American Medical Association, and from Handbooks 9 on Medicine and 10 on Dentistry, for 1925, published by the Regents of the University of the State of New York. The indicated requirements are minimum exactions, either as designated directly in the statutes or as specified by dental or medical boards of examiners or analogous official bodies in the exercise of their discretion under the laws. Where one

¹During the progress of the study the number of dental schools in the United States decreased from 46 in 1921-22 to 44 in 1925-26. At the end of 1922-23, the Dental School of the University of West Tennessee (Memphis), for Negroes, was discontinued; the Baltimore College of Dental Surgery and the College of Dental and Oral Surgery of New York were united with the dental schools of the University of Maryland and Columbia University, respectively. The School of Medicine and Dentistry of the University of Rochester was opened in 1925-26.

of two requirements is a prerequisite for the other, only the higher is mentioned. Enforcement of two years of approved work in an accredited academic college, for example, usually includes graduation from a four-year high school or the equivalent, making reference to the lower requirement superfluous here. The grades Class A, Class B, and Class C are those published by the authoritative body in each profession. The footnotes on pages 257 and 258 give additional details.

B. PLAN AND ARRANGEMENT

The statements regarding the schools have been divided into American and Canadian sections, and arranged in state or provincial units. For a state or province having more than one city containing a dental school, the data have been further subdivided into city groups, in the alphabetic order of the names of the cities. In subsections for cities containing at least two schools, the data have been disposed in the sequence of the seniority of the schools. General data are placed at the head of the state and provincial sections, each statistical statement regarding a school is followed by a "summary," and the state and provincial units terminate in "general comment."

Part VI in its entirety applies to conditions during the academic year 1924-25, except as otherwise noted. Important occurrences since the date of the Preface, when this record was closed and before the completion of the Index, are mentioned in the Appendix.¹

The "summaries" regarding the individual schools refer only to matters of special significance that may not be obvious from a general examination of the preliminary statistical statements, which indicate that, although most of the schools are integral parts of universities, few enjoy income from endowment or the equivalent, and that a majority subsist on fees, pay small salaries for instruction, have few whole-time teachers, are deficient in library facilities, offer no opportunity for graduate work, ignore research, are not intimately associated educationally with medical schools or hospitals, give no financial assistance to students, and make no systematic effort to guide their graduates into communities in need of dental service.

The unconcern for clinical dentistry at medical schools is mentioned frequently in the summaries. Although formal courses relating to the specialties of the eye, ear, nose, and throat are included in the undergraduate medical curriculum, analogous instruction on the maladies of the teeth and mouth are usually lacking. In emphasizing the neglect of oral health-service in medical schools it is not the writer's purpose to suggest that the present overload of specialties in the undergraduate medical curriculum should be increased. On the contrary, the integration, in the undergraduate medical curriculum, of suitable instruction in clinical dentistry with that relating to the parts adjacent to the mouth, and the reintegration of the useful content of the current courses in the special-

¹This Bulletin, especially in Part VI, reflects conditions during the years 1920-25 and, in some details, 1926.

ties with those in more general relationships, would seem to be preferable. Orientation courses on the chief correlations between medicine and dentistry, such as those at the medical schools of the Universities of Minnesota and Toronto, although requiring but a few hours, seem not only to help the physician to note the occurrence and import of pathological conditions in the mouth and to comprehend the scope of dental practice, but also to prepare him for responsible action regarding dental ailments, without encouraging him to believe that he has mastered any of the specialties of oral health-service.

Explanatory memoranda on some of the standard items in the statistical statements that may not be obvious in their import are summarized in the succeeding section, in the order of their usual arrangement.

C. MEMORANDA ON THE STATISTICAL STATEMENTS AND ON THE COMMENT RELATING TO THE INDIVIDUAL SCHOOLS

a. General data

“*Integral part*” of a university signifies that the trustees of the university have unqualified control of the school; “*affiliated*” indicates that the control of a school is shared by the trustees of a university with an owner or another authority; and “*associated*” means that the school is controlled by its owner, or its own board of trustees, under the nominal jurisdiction or patronage of the university. An “*independent*” school, in this terminology, is one that has no formal relation to any other educational institution. “*Proprietary*” designates the type of school that is or may be conducted for financial profit to an individual or to a corporation, and, by a regulation of the Dental Educational Council on ratings, is Class C in grade.

The designated ratings of medical schools are those published in 1925 by the Council on Medical Education and Hospitals of the American Medical Association.

Under “library facilities . . . conveniently accessible to dental students,” public libraries are mentioned in special instances only.

The direct health-service value of the schools in their several communities, and their immediate clinical opportunities, are indicated in a general way by the recorded number of persons treated annually and by the corresponding number of visits (sittings or operations).

The Dental Educational Council’s ratings are those that applied at the end of 1924–25. In nearly every case the rating, besides indicating the general status of a school, also suggests the quality of the general equipment, the efficiency of the technical training, the character of the infirmary facilities, and the grade of the work in clinical dentistry. Accordingly, these factors have been omitted from the details in the statistical statements. More recent ratings are indicated in the Appendix.

b. Financial details

The financial data are intended to indicate the main facts regarding the value of the property, and also the income and expenses for a period of five years, and have been compiled as uniformly as possible from a variety of accounting systems. Data for the fifth year (1924-25) are given in the tables in the Appendix.

"Fees (all kinds) paid by students" include payments for tuition and related purposes, but not fees for athletic, social, or other objects that do not support the educational work of the school.

In the tabulation of the income of university schools, under "university funds," in sub-section *b*, the "estimated amount of *miscellaneous income* available to the School as an integral part of the University, *but not specified in the dental budget*," includes such income or the financial equivalent as the school's share of funds available for the general support of the university, the salary value of cooperative teaching provided without charge by the medical school or other departments, and all similar contributory items; all of which are included also, in equal amounts, in the corresponding record of total expenditures for the year.

The "average amount expended by the School per student (D.D.S.) per year" has been calculated by dividing the amount of total expenditures for a year by the number of students in attendance at the *end* of that year. In some instances, capital items and estimated amounts for the depreciation of the property have been included in the totals for current expenditures, but in no case has a school thus allotted the interest on the "cost of the plant." Such variables having been included in some instances and excluded in others, the recorded amounts of expenditures per student cannot be closely comparable among the schools; nevertheless they present significant general indications. Variation in the import of the average value, for any school, may be estimated by comparing it with the amounts of the chief items of expenditure detailed with it. The numerical difference between the maximum attendance in any year and that at the end of the year, for a given school, is shown in the table entitled "students and graduates"; for 1924-25, in Table 6 in the Appendix.

The "average amount of all student fees paid to the School per student (D.D.S.) per year" has been calculated by dividing the amount of total income from such fees for a year by the number of students in attendance at the *end* of the year.

The expenditures "for all other purposes" are often disproportionate. For some university schools they are high because they include the "estimated amount of *miscellaneous income . . . not specified in the dental budget*"; for other schools they include disbursements that are essentially private in character.

For the sake of general convenience, the subjects included at present in dental curricula are grouped as

(a) *academic subjects*, such as physics and general chemistry, common to the curricula of academic colleges and of most dental schools;

(b) *medico-dental subjects* ("medical sciences"), such as physiology and bacteriology, common to the curricula of both dental and medical schools; and

(c) *dental subjects*, such as operative dentistry and oral surgery, peculiar to, or specially applied in, dental schools.

In harmony with this classification, teachers of *academic or medico-dental* subjects are distinguished from teachers of *dental* subjects, wherever types, numbers, and salaries of teachers are specified.

c. *Teachers and curricula*

The classification of the teachers for 1924-25 indicates the number that bear officially the titles specified.

"Advanced courses for dental practitioners" — so-called "post-graduate courses" — include advanced courses of any length, without reference to credit for a degree, and are distinguished from "graduate courses," which are parts of a program or curriculum of study in candidacy for a higher degree.

"Summer courses in clinical dentistry" are such as include daily instruction in an infirmary, for a period of at least one month.

d. *Tables entitled "students and graduates"*

In the tables presenting data regarding students and graduates, *maximum* attendance is distinguished from attendance at the *end* of the year, the graduating class being included in each total.

"Admitted after examination" is an abbreviation for admitted after an examination held to determine whether, in lieu of a qualifying diploma or certificate, the candidate attained the full equivalent of the school's published entrance requirement.

The admissions to advanced standing from other countries are included (in the line above, in the table) in the total number admitted to advanced standing.

The number of "repeaters" of one or more subjects also includes the number of students required to repeat a part of a subject.

In 1917-18 the three-year dental curriculum was universally lengthened to four years. Therefore, in 1920 the graduates were chiefly irregular students and, in most schools, their number was small.

The data pertaining to the collective results of the license examinations have been taken from the records compiled by the Joint Committee on Tabulation of the National Association of Dental Examiners and of the National Association of Dental Faculties (and its successor, the American Association of Dental Schools).

e. Summaries and general comment

In the "summaries," the data showing the geographical distribution of the students in 1924-25 were taken, in most cases, from the published annual announcements for 1925-26. In other instances they were supplied by the schools.

In some of the comparative tables for "total attendance," and for "classification of the total attendance" presented under "general comment," the data for 1924-25 differ slightly from the data for the same year, in the tables for geographical distribution, because the figures in the comparative tables usually represent the number of students at or near the *end* of the year, whereas those in the tables for geographical distribution commonly indicate the *maximum* number. Without this explanation, these minor disagreements and several similar irregularities, which do not affect the conclusions that may properly be drawn from the data, might appear to be clerical or typographical errors.

The data for total attendance, in 1925-26, represent the number of students in December, 1925.

D. SPECIAL ACKNOWLEDGMENT

In order to ensure complete accuracy for each school, in the presentation of the intimate details in this Part, copies of the original manuscripts of the statistical statements were submitted to the respective deans for approval or correction. After successive extensions and revisions since January, 1925, two printed copies of this Introduction and at least five different printer's proofs of the corresponding statistical statement were presented to each dean, with the request that all of the data be rechecked and verified or corrected in the light of the foregoing memoranda. Each dean also received at least two printer's proofs of the "summary" and "general comment" relating to his school, for the correction of errors in the statement of facts. These requests, like all others addressed to the officers of the dental schools, were almost invariably given the generous attention of the dean or his executive assistants.

E. GENERAL MEMORANDA

Of the forty-nine undergraduate dental schools in the United States and Canada at the beginning of 1925-26, forty-one were parts of, or were affiliated or associated with, universities; three were units in colleges consisting solely of professional departments; and five were independent, of which three were proprietary (page 254). A general classification of these schools in terms of their minimum entrance requirements puts them into these groups: (a) Years of approved work in an accredited academic college—*three* years, 2 schools (1 without students); *two* years, 4 schools; *one* year, 27 schools. (b) Graduation from a high school or its equivalent—16 schools.

Doctor of Dental Surgery is awarded, as the general professional degree, by all of the dental schools in Canada and the United States except those of Harvard University, Tufts College, and North Pacific College of Oregon, which give the D.M.D. degree. The Dental School of the University of Alberta, which had been offering preclinical instruction only but in 1925-26 extended the professional curriculum to four years, will graduate the first class (D.D.S.) in 1927.

Since the close of the World War, women have been admitted to all of the dental schools in North America except those in Georgetown, Harvard, and St. Louis Universities, the Baltimore College of Dental Surgery (united with the School of Dentistry of the University of Maryland in 1923), and the Kansas City-Western Dental College.

On June 30, 1925, there were twenty-four medical units and eight dental units in the Reserve Officers Training Corps of the United States Army. The dental units were located in the dental schools at Creighton, Iowa, Minnesota, Northwestern, Ohio State, Pennsylvania, and St. Louis Universities, and the North Pacific College of Oregon.

During the past three decades dental schools, like medical schools, have been decreasing in number although at a slower rate. The data in the appended table show the rise and fall in the numbers of each type at the end of successive decades during the past one hundred years. The names of the dental schools that were discontinued or organized during the progress of the present study are given in the footnote on page 245.

NUMBER OF DENTAL SCHOOLS AND MEDICAL SCHOOLS IN THE UNITED STATES AT SUCCESSIVE INTERVALS SINCE 1825

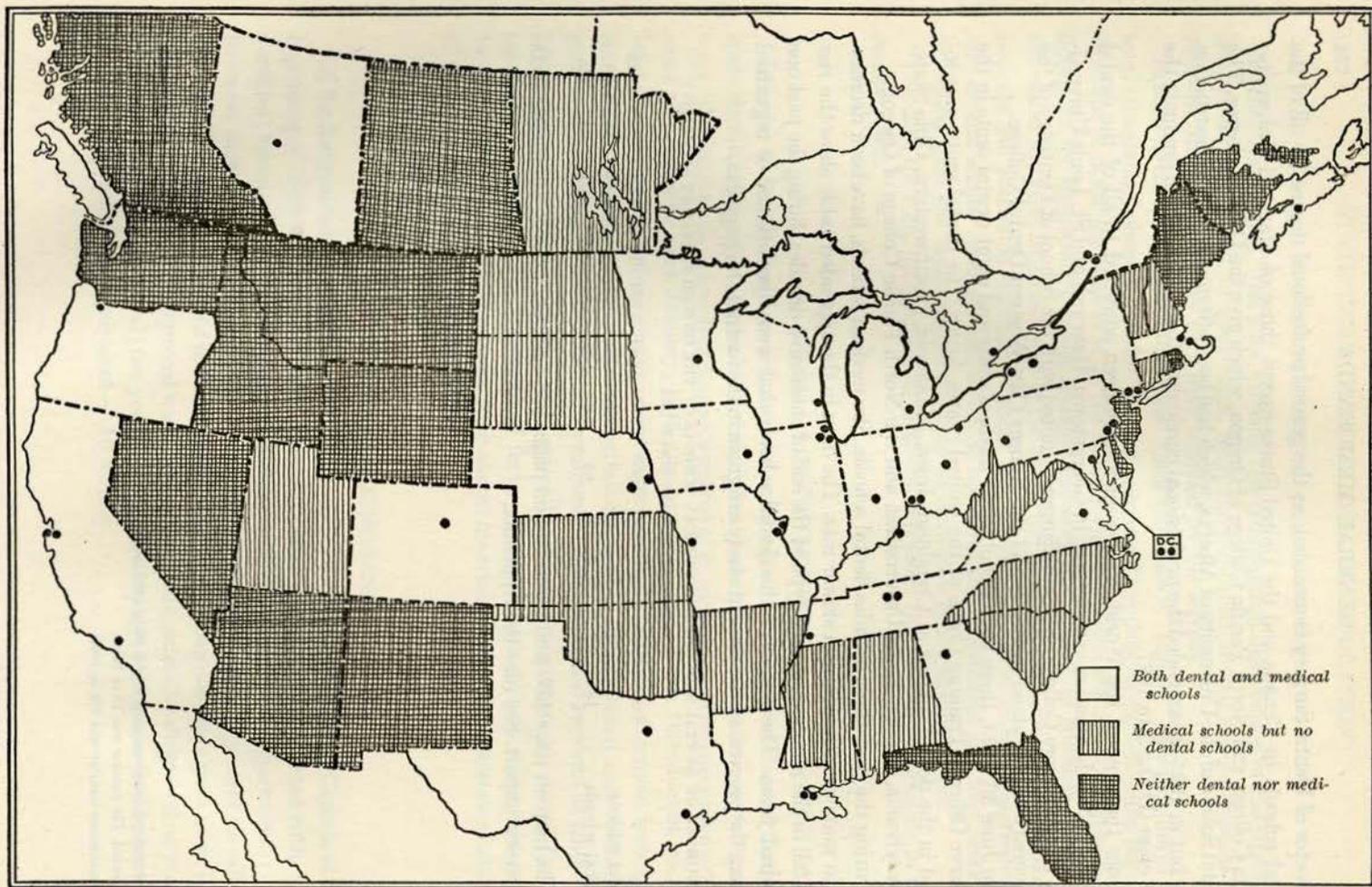
	1825	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1925
Dental schools	0	0	1	2	3	10	13	34	57 ¹	54	48	44
Medical schools	16 ²	21	33	52	65	75	100	133	160 ³	131	85	80

The map on page 252, and the tables on pages 253 and 254, present additional facts of general import. See also the Appendix.

¹The estimated maximum number was 60 in 1902 (page 48).

²Estimated. The number was 12 in 1820.

³The maximum number was 162 in 1906.



MAP SHOWING THE LOCATION, THE DISTRIBUTION, AND THE NUMBER OF DENTAL SCHOOLS,
AND THE DISTRIBUTION OF MEDICAL SCHOOLS, IN CANADA AND THE UNITED STATES

[The dots indicate the location of the individual dental schools listed on the opposite page]

NAMES OF THE STATES, PROVINCES, AND CITIES IN THE UNITED STATES AND CANADA IN WHICH UNDERGRADUATE SCHOOLS OF DENTISTRY ARE LOCATED : 1925-26¹

(Where more than one school exists, the number is shown by a numeral in parenthesis)

UNITED STATES

(Twenty-two states and the District of Columbia : forty-four schools)

CALIFORNIA (3) Los Angeles San Francisco (2)	ILLINOIS (3) Chicago (3)	MARYLAND Baltimore	MISSOURI (3) Kansas City St. Louis (2)	OHIO (4) Cincinnati (2) Cleveland Columbus	TENNESSEE (3) Memphis Nashville (2)
COLORADO Denver	INDIANA Indianapolis	MASSACHUSETTS (2) Boston (2)	NEBRASKA (2) Lincoln Omaha	OREGON Portland	TEXAS (2) Dallas Houston
DISTRICT OF COLUMBIA (2) Washington (2)	IOWA Iowa City	MICHIGAN Ann Arbor	NEW YORK (4) Buffalo New York (2) Rochester	PENNSYLVANIA (3) Philadelphia (2) Pittsburgh	VIRGINIA Richmond
GEORGIA Atlanta	KENTUCKY Louisville	MINNESOTA Minneapolis		WISCONSIN Milwaukee	
	LOUISIANA (2) New Orleans (2)				

CANADA

(Four provinces: five schools)

ALBERTA : Edmonton	NOVA SCOTIA : Halifax	ONTARIO : Toronto	QUEBEC (2) : Montreal (2)
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NAMES OF THE STATES AND PROVINCES IN WHICH THERE ARE NO SCHOOLS OF DENTISTRY : 1925-26

UNITED STATES

(Twenty-six states)

* Alabama	Florida	Montana	New Mexico	Rhode Island	* Vermont
Arizona	Idaho	Nevada	* North Carolina	* South Carolina	Washington
* Arkansas	* Kansas	* New Hampshire	* North Dakota	* South Dakota	* West Virginia
* Connecticut	Maine	New Jersey	* Oklahoma	* Utah	Wyoming
Delaware	* Mississippi				

CANADA

(Five provinces)

British Columbia	† Manitoba	New Brunswick	Prince Edward Island	Saskatchewan
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* Contains at least one Class A medical school. The medical schools in Alabama, Arkansas, Mississippi, New Hampshire, North Carolina (2), North Dakota, South Dakota, Utah, and West Virginia give only the first two years of the medical curriculum.

† Contains a school of medicine (University of Manitoba).

¹ Each of these states and provinces, and each of the cities except Kansas City, Lincoln, and Houston, contains at least one approved school of medicine.

GENERAL CLASSIFICATION OF THE FORTY-NINE DENTAL SCHOOLS IN THE
UNITED STATES AND CANADA: 1925-26

UNITED STATES (44)

University schools (36)¹

* Baylor	* Iowa	* Pennsylvania
* Buffalo	* Louisville	* Pittsburgh
* California	* Loyola (Chicago)	* Rochester
* Cincinnati	Loyola (New Orleans)	* St. Louis ²
* Columbia	* Marquette	Southern California
* Creighton	* Maryland	* Temple
Denver	* Michigan	* Tennessee
* Georgetown ²	* Minnesota	* Tufts
* Harvard ²	Nebraska	* Tulane
* Howard	* New York	* Vanderbilt
* Illinois	* Northwestern	* Washington
* Indiana	* Ohio State	* Western Reserve

Schools in colleges consisting solely of professional departments (3)

* Meharry Medical College	North Pacific College of Oregon
	* Medical College of Virginia

Independent schools (5)

Atlanta-Southern Dental College ³	San Francisco College of Physicians and
Cincinnati College of Dental Surgery ³	Surgeons, School of Dentistry ⁴
Kansas City-Western Dental College ²	Texas Dental College ³

CANADA (5)

University schools (5)¹

* Alberta	* McGill	* Toronto
* Dalhousie	* Montreal	

* The university (or college) contains an undergraduate school of medicine in the city where its dental school is located.

¹ Only the abbreviated names of the universities are indicated. The academic colleges of most of the universities are located in the cities containing the dental schools.

² One of the four existing dental schools, in North America, in which women have not been among the candidates for the professional degree in dentistry, since 1918.

³ Proprietary.

⁴ The medical school indicated by the general name was discontinued in 1918.

SECTION A

DENTAL SCHOOLS IN THE UNITED STATES

ALABAMA

Approved by the Board of Regents of the State of Alabama, February 22, 1900, and amended by the Board of Regents of the State of Alabama, February 22, 1901.

Section 1. The State of Alabama shall have a dental school to be located at the University of Alabama, to be known as the Alabama Dental School, and shall have a dental school to be located at the University of Alabama, to be known as the Alabama Dental School, and shall have a dental school to be located at the University of Alabama, to be known as the Alabama Dental School.

Section 2. The State of Alabama shall have a dental school to be located at the University of Alabama, to be known as the Alabama Dental School, and shall have a dental school to be located at the University of Alabama, to be known as the Alabama Dental School.

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Section 4. The State of Alabama shall have a dental school to be located at the University of Alabama, to be known as the Alabama Dental School, and shall have a dental school to be located at the University of Alabama, to be known as the Alabama Dental School.

STATISTICAL DATA ON DENTAL EDUCATION

GENERAL CLASSIFICATION OF THE FORTY-NINE DENTAL SCHOOLS IN THE
UNITED STATES AND CANADA: 1925-26

UNITED STATES (44)

University schools (36)¹

* Baylor	* Iowa	* Pennsylvania
* Buffalo	* Louisville	* Pittsburgh
* California	* Loyola (Chicago)	* Rochester
* Cincinnati	Loyola (New Orleans)	* St. Louis ²
* Columbia	* Marquette	Southern California
* Creighton	* Maryland	* Temple
Denver	* Michigan	* Tennessee
* Georgetown ²	* Minnesota	* Tufts
* Harvard ²	Nebraska	* Tulane
* Howard	* New York	* Vanderbilt
* Illinois	* Northwestern	* Washington
* Indiana	* Ohio State	* Western Reserve

Schools in colleges consisting solely of professional departments (3)

* Meharry Medical College	North Pacific College of Oregon
* Medical College of Virginia	

Independent schools (5)

Atlanta-Southern Dental College ³	San Francisco College of Physicians and
Cincinnati College of Dental Surgery ³	Surgeons, School of Dentistry ⁴
Kansas City-Western Dental College ²	Texas Dental College ³

CANADA (5)

University schools (5)¹

* Alberta	* McGill	* Toronto
* Dalhousie	* Montreal	

* The university (or college) contains an undergraduate school of medicine in the city where its dental school is located.

¹ Only the abbreviated names of the universities are indicated. The academic colleges of most of the universities are located in the cities containing the dental schools.

² One of the four existing dental schools, in North America, in which women have not been among the candidates for the professional degree in dentistry, since 1918.

³ Proprietary.

⁴ The medical school indicated by the general name was discontinued in 1918.

SECTION A

DENTAL SCHOOLS IN THE UNITED STATES¹

ALABAMA

Population:² 2,456,370. Number of dentists, 530; physicians, 2284. Ratios: dentists to population, 1: 4635; physicians to population, 1: 1076; dentists to physicians, 1: 4.3

Statutory requirements.³ *Dentistry*.—Preliminary education: fourteen earned high-school units. Professional training: graduation from a dental school recognized by the National Association of Dental Examiners. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school⁴

Dental school:⁵ none; medical school:⁵ University of Alabama (gives only the first two years of a four-year curriculum)

ARIZONA

Population: 401,016. Number of dentists, 119; physicians, 378. Ratios: dentists to population, 1: 3369; physicians to population, 1: 1061; dentists to physicians, 1: 3.2

Statutory requirements. *Dentistry*.—Preliminary education: none. Professional training: graduation from a reputable dental school or a license from the board of another state. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A or Class B medical school

Dental school: none; medical school: none

ARKANSAS

Population: 1,843,750. Number of dentists, 423; physicians, 2212. Ratios: dentists to population, 1: 4359; physicians to population, 1: 834; dentists to physicians, 1: 5.2

Statutory requirements. *Dentistry*.—Preliminary education: none. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education:

¹ The territories have not been included.

² Nearly all of the figures for population throughout Part VI, as explained on page 245, are estimates as of January 1, 1925, or June 1, 1925, by census authorities in the United States and Canada, respectively.

³ The statutory requirements in each state have been compiled from the sources indicated on page 245. The requirements for medicine are those for general practitioners having the M.D. degree ("physicians"); for dentistry, those for general practitioners having the D.D.S. degree or its equivalent ("dentists"). This comparison, intended to show only the differences between the highest medical requirements and those for dentistry, does not include specifications for homeopathy, osteopathy, and other special systems of the practice of medicine.

⁴ Some of the statutes permit state boards to enter reciprocal agreements by which experienced practitioners from one state are licensed in another, regardless of educational deficiencies in terms of current formal requirements.

⁵ In these summaries all of the undergraduate schools are indicated, but "post-graduate" schools are omitted.

two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school

Dental school: none; medical school: University of Arkansas (gives only the first two years of a four-year curriculum)

CALIFORNIA

Population: 3,967,278.¹ Number of dentists, 3943; physicians, 8363. Ratios: dentists to population, 1:1006; physicians to population, 1:474; dentists to physicians, 1:2.1

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited high school or its equivalent, or a certificate showing five years of licensed practice. Professional training: graduation from an approved dental school. *Medicine*.—Preliminary education: one year of approved work in an accredited academic college. Professional training: graduation from an approved medical school

Location of the dental schools (3): Los Angeles, and San Francisco (2); medical schools (3): Loma Linda and Los Angeles, and San Francisco (2)

LOS ANGELES

Population: 1,100,000.² Number of dentists, 998; physicians, 2273. Ratios: dentists to population, 1:1102; physicians to population, 1:484; dentists to physicians, 1:2.3

Number of dental clinics or infirmaries, 75;³ hospitals, sanatoriums, and charitable institutions, 50; hospitals approved for internships, 7

Dental School: University of Southern California. *Medical School* (Loma Linda and Los Angeles): College of Medical Evangelists

COLLEGE OF DENTISTRY, UNIVERSITY OF SOUTHERN CALIFORNIA

Location (clinical building): Los Angeles Street, at Sixteenth Street; one mile from the centre of the city and two miles from the site of the University

General character: associated with the University of Southern California; under the management, since 1905, of an independent Board of Trustees of nine members. Of this Board, one is the President of the University. Five members represent the Faculty of the College of Dentistry, and one each the Southern California Dental Association (incorporated), the Los Angeles County Dental Society (incorporated), and the Alumni Association of the College of Dentistry (incorporated)

Organized: in 1897, in affiliation with the Medical School of the University. Proprietary

¹ This estimate, given by the Director of the Census, may not make due allowance for the exceptional growth of Los Angeles since 1920. See the succeeding footnote.

² Estimates for all of the other cities in the United States that are included in this Bulletin, made by the Director of the Census (page 245), are based on the assumption that the yearly increase in population since 1920 was equal to the average annual increase between 1910 and 1920. The Director of the Census, believing that this mode of calculation would not give approximately correct figures for Los Angeles, withheld an estimate. The figure given here, for January 1, 1925, is the official estimate of the Los Angeles Chamber of Commerce, as submitted by the Secretary, Mr. Arthur G. Arnoll.

³ The number of dental clinics or infirmaries in each city named in Part VI has been given by a dean of a dental school; the corresponding number of hospitals and similar institutions has been obtained from the *Medical Directory* published in 1925 by the American Medical Association.

from 1897 to 1905. When it was rechartered as a non-proprietary educational institution in 1905, its stockholders presented to the new organization, as a gift, the equipment valued at approximately \$2000 and a fund of \$6816

Buildings: three. "Science and technic" building, for the instruction of freshmen and sophomores; erected in 1920, on the extended campus of the University; floor area, 22,320 sq. ft. "Social hall," used as a student union and for recitations; erected in 1924-25, adjoining the "science and technic" building; floor area, 1092 sq. ft. "Clinical building," for the instruction of juniors and seniors; situated about two miles from the other two buildings; erected in 1914; important interior improvements were made annually during 1922-25; floor area, 30,500 sq. ft. Total floor area in the two main buildings, 52,820 sq. ft.

Infirmary: in the "clinical" building, with eight accessory rooms; total floor area, 17,690 sq. ft. Total number of chairs in active use, 150, including groups reserved for special purposes: crown and bridge work, 16; prosthodontia, 16; root-canal treatment, 8; oral surgery, 3; examination, and orthodontia, 2, each; roentgenography, 1

School of Medicine: the University has been without a medical school since 1920

Dispensaries and Hospital in which dental students received accredited instruction, or performed stated clinical service, in 1924-25 (the distances are those from the "clinical building"): Belvedere Centre (six miles), Juvenile Hall (four miles), Los Angeles General Hospital (three miles), Los Angeles Orphanage (three miles), Los Angeles Orphanage, Hollywood Branch (seven miles), McKinley Home for Boys (thirteen miles), Plaza Community Centre (two and one-half miles), Protestant Welfare Home for Boys (four miles), and St. Katherine Orphanage (twenty miles)

Clinical facilities in the Dispensaries and Hospital where dental students received instruction in 1924-25: in each Dispensary, a complete dental equipment; in the Hospital, adequate for all aspects of medicine and surgery

Number of dental internships or externships, held by officers or students of the School, in the Dispensaries or Hospital in 1924-25: none

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the "clinical building," in 1924-25: oral surgery in the Los Angeles General Hospital and general operative dentistry in the Dispensaries; to teach the practice of dentistry under the conditions that prevail in good hospitals, and to assist local institutions in their charitable health service to indigent children

Libraries: two. In the "clinical building": room, 1074 sq. ft.; no librarian; whole-time clerks in attendance. Contains 2000 bound and 570 unbound volumes, and many pamphlets (the bound volumes are effectively card indexed); of the volumes, approximately 1250 relate to dental subjects. In the "science and technic building": 1064 sq. ft.; no librarian; whole-time clerks in attendance. Contains 997 bound and 109 unbound volumes, and many pamphlets (the volumes are effectively card indexed); of the volumes, approximately 525 relate to dental subjects. Total number of volumes in both libraries: bound, 2997; unbound, 679; total, 3676

Library facilities additional to those in the two dental buildings that are conveniently accessible to dental students: University Library (two blocks from the "science and technic" building), Y. M. C. A. Library (one block from the "science and technic" building), and the Los Angeles Public Library — new Branch (three blocks from the "science and technic" building)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: fifty-two students; total amount, about \$12,700, of which \$1000 was provided by the School from its Student Loan Fund; the remainder was derived from national, state, and private sources

Dean: whole-time officer; also Professor of Clinical Dentistry. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: Secretary of the Faculty; also Professor of Operative Dentistry, and General and Dental Histology

Minimum academic requirement for admission to the first-year class, in September, 1924: "completion of a four-year high school course as given in an accredited four-year high school, equivalent to 15 units (minimum grade of 80 per cent), and, in addition, the principal's recommendation for admission to a college," or the equivalent as determined by "examination conducted by the University" (since 1923)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

The School will lengthen its curriculum to five years, the first of which will be devoted to academic subjects, including a course to test vocational aptitude; and full-year graduate curricula will be inaugurated. Students who have completed the equivalent of one year of approved work in an accredited academic college will be admitted to the second year of the five-year curriculum. Qualified students will receive the B.S. degree at the end of the fourth year, D.D.S. at the end of the fifth year. The M.S. and D.D.Sc. degrees will be awarded to successful graduate students

Number of graduates (1900-25): 1113; average per year, for twenty-six years, 43

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 357; proportion from California: 1922-23—60 per cent; 1923-24—68 per cent; 1924-25—56 per cent

Clinical service of the Dental School in the instruction of students:¹

Number of persons treated: 1920-21—2400; 1921-22—4100; 1922-23—6000; 1923-24—11,500; 1924-25—13,400 (the figures are estimates)

Number of operations: 1920-21—13,200; 1921-22—22,550; 1922-23—33,000; 1923-24—63,250; 1924-25—73,700 (the figures are estimates)

Number of patients treated in the Dispensaries and Hospital, by dental students under the supervision of representatives of the Dental School: 1920-24—none; 1924-25—1200 (estimate)

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value of land and buildings, \$493,475, and equipment, \$95,817; total, \$589,292 (July 1, 1925)

General debt on the School (July 1, 1925): \$83,400 at 7 per cent interest per annum

Accumulated net assets (July 1, 1925): \$729,814; a large proportion represents accretion of values of land and buildings owing to the exceptional growth of the city

	(1)	(2)	(3)	(4)
Data for years ending on July 31	1920-21	1921-22	1922-23	1923-24
<i>Current income</i> : ²				
Fees (all kinds) paid by the students	\$77,383	\$121,327	\$136,743	\$147,592
Fees paid by patients, in all clinical departments	34,021	47,596	76,410	93,934
Interest: students' notes and bank deposits	687	1,539	1,811	2,032
<i>Carried forward</i>	\$112,091	\$170,462	\$214,964	\$243,558

¹ The number of patients given free treatment in the Infirmary, and the monetary value in corresponding normal charges, were the following: 1921-22—250 patients, \$700; 1922-23—600 patients, \$1800; 1923-24—1500 patients, \$4100; 1924-25 (estimate)—1800 patients, \$5000.

² During the academic years 1920-24, no surplus was used for current expenditures; there was no appropriation by the State or City, and no current income from endowment or gift; no money was borrowed for current expenditures; and all miscellaneous receipts are included in the recorded items above.

	(1)	(2)	(3)	(4)
Data for years ending on July 31	1920-21	1921-22	1922-23	1923-24
<i>Current income, brought forward</i> ¹	\$112,091	\$170,462	\$214,964	\$243,558
Miscellaneous receipts	637	116	3,164	15
From the University	None	None	None	None
Total amount of current income	\$112,728	\$170,578	\$218,128	\$243,573
<i>Total amount of current expenditures</i>	\$99,569	\$131,376	\$176,976	\$182,262
Net income for the year	13,159	39,202	41,152	61,311
<i>Capital income :</i>				
Net current income	\$13,159	\$39,202	\$41,152	\$61,311
Gifts from alumni to the building fund	8,265	870	None	None
Money borrowed during the year (mortgage)	40,000	None	None	27,000
Total amount of capital income	\$61,424	\$40,072	\$41,152	\$88,311
<i>Capital expenditures :</i>				
For reduction in principal of debt (mortgage)	None	\$11,000	\$11,600	\$20,000
For new equipment	\$13,359	32,319	5,725	4,071
For new construction and real estate	32,068	8,877	5,132	41,482 ²
For additions of books to the libraries	200	350	430	956
Total amount of capital expenditures	\$45,627	\$52,546	\$22,887	\$66,509
Surplus	\$15,797	...	\$18,265	\$21,802
Deficit	...	\$12,474	...	...
Surplus paid to the University	None	None	None	None
Average amount expended by the School per student (D.D.S.) per year	309	291	328	328
Average amount of all student fees paid to the School per student (D.D.S.) per year	240	269	254	265
<i>Details of current expenditures:</i>				
Paid to the University	None	None	None	None
For interest on debt	4,829	4,040	3,128	3,200
For rent	None	None	None	None
For repairs	1,888	3,720	7,503	7,908
For research	None	None	None	None
For maintenance of the library ³	132	249	132	486
For supplies used in the clinical departments	8,486	10,157	14,683	15,448
For salaries : for administration	4,830	9,710	14,780	16,305
For salaries : for teaching	49,513	64,185	86,227	89,199
For all other purposes	29,891	39,315	50,523	49,716
<i>Salaries for instruction :</i>				
(Number of teachers of dental subjects)	(31)	(42)	(41)	(38)
Amount of their salaries as teachers	33,705	42,987	59,461	62,433
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	4,200	6,830	8,000	8,129

¹ During the academic years 1920-24, no surplus was used for current expenditures; there was no appropriation by the State or City, and no current income from endowment or gift; no money was borrowed for current expenditures; and all miscellaneous receipts are included in the recorded items above.

² Of this amount \$20,000 was expended for new land adjacent to the site of the University.

³ See "Capital expenditures," above.

DENTAL SCHOOLS IN THE UNITED STATES

	(1)	(2)	(3)	(4)
Data for years ending on July 31	1920-21	1921-22	1922-23	1923-24
Smallest salary paid to a whole-time teacher of a dental subject	\$1,500	\$1,500	\$1,800	\$1,800
(Number of teachers of academic or medico-dental subjects)	(18)	(21)	(23)	(25)
Amount of their salaries as teachers	15,808	21,198	26,766	26,766
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	3,600	4,850	4,450	4,450
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,900	2,200	1,500	1,800

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 65. Of this total number, 7 were whole-time, 1 was a half-time, and 15 were part-time or occasional teachers of academic or medico-dental subjects; 24 were whole-time, 3 half-time, and 15 part-time or occasional teachers of dental subjects; 31 were whole-time teachers in the Dental School only; 16 were "full" professors; 15 were associate, assistant, or clinical professors; 4 were lecturers by title; all received salaries; 11 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1923; now six years in length; to be five years, beginning in 1926-27

STUDENTS AND GRADUATES: COLLEGE OF DENTISTRY, UNIVERSITY OF SOUTHERN CALIFORNIA

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	210	239	342	479	576	592
Women.....	4	7	9	11	12	14
From other countries; chiefly from Canada, Hawaiian Islands, South America, and Japan.....	9	12	15	22	25	43
Negroes.....	2	3	7	6	5	5
Attendance at the end of the year.....	178	225	322	451	539	556
Admitted after examination.....	6	5	13	10	8	11
Admitted to advanced standing.....	0	0	0	3	2	18
From other countries, to advanced standing.....	0	0	0	0	0	1
"Repeaters" of one or more subjects.....	No available data			21	34	55
Denied further instruction because of deficient scholarship.....	No available data			23	40	14
GRADUATES (D.D.S.)						
Total number of graduates.....	82	20	42	42	100	116
Women.....	3	1	1	2	2	3
Admitted to practice in other countries.....	No available data					
Negroes.....	0	0	1	2	0	1
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	3	1	1	1	1	3 ¹
Percentages of failures in such state-board examinations.....	3.5	31.5	8.6	2.4	6.3	1.0

Summer courses in clinical dentistry (June to September, inclusive): since 1905; attendance: 1922—75; 1923—100; 1924—150; 1925—120 (the figures are estimates)

No course for dental mechanics (discontinued in 1923),² assistants, or technicians; no

¹The official published report mistakenly gives 1 as the number. Graduates passed license examinations in Arizona, California, and Utah.

²Course for dental mechanics: attendance in 1920-21—60; 1921-22—81; 1922-23—2. Increase in the number of candidates for the degree of D.D.S. made it expedient, for lack of room, to discontinue this course, pending the erection of a new "clinical" building, when the course will be reestablished. Plans for the development of instruction for dental hygienists and graduates have been held in abeyance for the same reason.

course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: actively in progress in 1924-25, on the validity of claims for various commercial dental supplies; sufficiency of various alloys; action of gases in casting processes; histopathology of diseases of the peridental membrane and alveolar structures; influence of incisal guidance on the problem of both the arrangement and functional requirements of full or partial dentures, its correlation with the structural and anatomical peculiarities of the masticating unit, and its demands for certain types and moulds of teeth; influence of inter-maxillomandibular relationship and tooth harmony on facial contour and esthetics; mechanics involved in the arrangement of the teeth; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: April and July, 1922

The foregoing data have been verified in detail by the Dean

SUMMARY

THIS School is the last of the group of dental colleges which, although actually independent, have been loosely associated with universities. The Dean sanctions the statement that the present relation can be converted into an organic union when the University agrees to set aside, for the permanent support of dental education, a fund equal to the value of the School's property on the date of the transfer of its ownership to the University. In 1920 the Medical School of the University having become unacceptable was discontinued. The University, which is without resources for the conduct of medical education and is unable to meet the financial conditions of the Trustees of the Dental School, cannot at present assume control of the School. The obvious need for greatly improved community health-service in all of its divisions, and the opportunity of the University to cooperate in its maintenance, if the means were at hand, should appeal persuasively to the people of a city that is growing as rapidly and which is as large, wealthy, and important as Los Angeles.

The work of the School is conducted in two general divisions, in two widely separated buildings. Additional land has been obtained near the science and technic building, adjacent to the site of the University, where it is expected the School will ultimately be rebuilt, and where a great health centre might be created for Los Angeles. Although having a high appreciation of the practical aspects of dentistry, the Faculty has underrated the importance of the preprofessional and the scientific foundations. Thus physics, which has not been required for admission, has been receiving only casual attention despite its basic relation to dental practice. In the first year (1925-26) it is "covered in a course of lectures [without laboratory work, and] . . . in a very large sense . . . made an adjunct of chemistry" (Announcement, 1925-26, p. 40). But the neglect of physics is common in dental schools. In 1924-25, when only one other dental school had a larger number of whole-time instructors, twenty-three teachers of academic and medico-dental subjects—seven on whole-time duty—received salaries amounting to only \$34,864, an increase of approximately \$8000 over the amount paid for the same service during 1923-24. The Faculty has restricted its attention to the instruction of undergraduates, and research has not received financial support. Fortunately, the improved scholastic conditions beginning in 1926-27 (page 260), will help to correct some of the important deficiencies. But it is to be

hoped that the School, aiming to improve its educational quality, will soon find it desirable to leave to academic colleges the task of giving its students their academic education, instead of increasing both the length of its curriculum to five years and the number of its students, and thus assuming extra obligations in good teaching that will become steadily more difficult to meet.

The School has a wider influence than either of the two in San Francisco. From about 30 to 45 per cent of the number of its students in recent years have resided elsewhere than in California. In 1924-25, as may be seen in the accompanying table, many states were represented in the attendance and the number of students from foreign countries was relatively large. Non-resident students were received chiefly from Arizona, Colorado, Hawaiian Islands, Texas, Utah, and Washington. During the past sixteen years (1910-25) graduates of the School have taken their initial license examinations in nine states.

The total attendance has been exceeding the School's capacity, despite earnest effort through frequent enlargements and renovations during the past few years to provide the necessary room and equipment. It is doubtful whether any dental school in the United States or Canada is able at present to give intimate, sincere, and adequate instruction to 150 students in any of its classes. The comment on page 323, on the undesirable consequences of overcrowding a dental school, might be appropriately stated here. Comparative data relating to students, graduates, and results of license examinations, are given on pages 279 and 280.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF SOUTHERN CALIFORNIA: 1924-25

<i>States (34), territory (1), and foreign countries (9)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Arizona	12	4	3	5	24
California	108	71	98	81	358
Canada	4	1	2	2	9
Colorado	2	3	5	6	16
Hawaiian Islands	7	6	6	5	24
Idaho	1	3	3	0	7
Iowa	1	0	5	1	7
Kansas	2	2	3	2	9
Michigan	3	1	0	3	7
Minnesota	1	1	3	2	7
Missouri	2	1	2	2	7
Montana	4	2	1	1	8
New York	2	2	2	1	7
Texas	1	5	1	6	13
Utah	11	11	9	8	39
Washington	4	2	3	8	17
Wisconsin	1	0	3	4	8
Argentine, Connecticut, India, Italy, Japan, Kentucky, Massachusetts, Mexico, New Mexico, Nicaragua, Oklahoma, Russia, Sweden, West Virginia— one or two each	3	4	6	1	14
Louisiana, Nebraska, Nevada, New Jersey, Ohio, Oregon, Tennessee— three or four each	9	4	4	7	24
Illinois, Indiana, North Dakota, Pennsylvania, South Dakota, Wyoming— five or six each	7	14	6	8	35
Total	185	137	165	153	640

SAN FRANCISCO

Population: 552,907. Number of dentists, 882; physicians, 1456. Ratios: dentists to population, 1: 627; physicians to population, 1: 380; dentists to physicians, 1: 1.7. Number of dental clinics or infirmaries, 29; hospitals, sanatoriums, and charitable institutions, 38; hospitals approved for internships, 14.

Dental Schools: (1) University of California, and (2) College of Physicians and Surgeons. *Medical Schools* (2): University of California, and Stanford University

(1) COLLEGE OF DENTISTRY, UNIVERSITY OF CALIFORNIA

Location: Parnassus Avenue and Arguello Boulevard, adjacent to the Medical School; four miles from the centre of the city, and sixteen miles from the main site of the University (Berkeley)

General character: integral part of the University of California

Organized: in 1881; conducted in close affiliation with the School of Medicine until 1891

Building: erected in 1900, on the site of the group of professional schools, including the Medical School and the George Williams Hooper Foundation for Medical Research, both of which are adjacent; enlarged in 1916; occupied jointly with the College of Pharmacy; total floor area used by the College of Dentistry, 39,200 sq. ft.

Infirmary: in the dental building, with eight accessory rooms; total floor area, 8000 sq. ft. Total number of chairs in active use, 128, including groups reserved for special purposes: plate dentures, and crown and bridge work, 11 each; extraction, 2; children special, examination, oral surgery, and roentgenography, 1 each

Relation of the School of Medicine (Class A). The first two years in medicine are taught in the laboratories at Berkeley; all of the instruction in dentistry is given in San Francisco. This condition prevents effective coöperation between the School of Medicine and the College of Dentistry in teaching the medico-dental subjects to students of dentistry. The Professor of Bacteriology in the University supervises the instruction in bacteriology, and the Associate Professor of Pathology in the Medical School teaches pathology, in the College of Dentistry. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Homes and Hospital in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: St. Catherine Home, for girls (three miles), and Boys' Aid (one mile); mouth hygiene and emergency service (reparative service for 360 boys is performed in the College Infirmary). Relief Home (one mile), for aged and infirm; extraction and emergency service. Shriner's Orthopedic Hospital (one mile); mouth hygiene and reparative service for an average daily attendance of 50 children. San Francisco Nursery for Homeless Children (two miles); mouth hygiene and reparative service for 90 children. The students receive no instruction in the University Hospital, nor in the San Francisco Hospital where the University enjoys important privileges

Clinical facilities in the Homes and Hospital where dental students received instruction in 1924-25: adequate for the character of the service rendered; the Hospital and Nursery have excellent new equipment

Number of dental internships (2) and externships (3), held by officers and students of the School, in the Homes in 1924-25: five

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: credit for mouth hygiene and other dental service, under

the supervision of members of the Faculty, on the basis of five units per hour for the service rendered (since 1919)

Library (in the dental building): room, 1181 sq. ft.; whole-time librarian. Contains 4000 bound and 350 unbound volumes, and 300 pamphlets and manuscripts (all effectively card indexed). Of the bound volumes, approximately 3800 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: libraries in the adjacent medical buildings

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: nineteen students; total amount, \$1300, of which all was provided by the School in student assistantships. [The Dean has not included "the thousands of dollars" received by or for students from various loan funds, the U. S. Veterans Bureau, the California State Veterans Welfare Board, etc.]

Dean: whole-time officer; also Professor of Chemistry and Metallurgy. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: whole-time secretary

Minimum academic requirement for admission to the first-year class, in August, 1924: "recommended graduation from an accredited or approved high school; or successful examination in the preparatory subjects constituting a standard high-school course," as determined by the University or the College Entrance Examination Board

Next prospective advance in the minimum academic requirement for admission: uncertain

In October, 1924, the Academic Senate of the University provisionally approved "a plan for dental education," which in February, 1925, was submitted to the members of the Association of American Universities, to the deans of the dental schools in Canada and the United States, and to others interested in dental education. In May, 1925, it was published in *Dental Cosmos* (lxvii, p. 452). The general plan, as amended to become effective in August, 1928, and subject meanwhile to further revision, continues all of the present curricula (page 269), but introduces these readjustments and additions:

(A) The four-year dental curriculum that is now based directly on a high school education ("0-4 plan") will "represent the irreducible minimum of instruction necessary for the general practice of dentistry under license without supervision." These graduates will receive the degree of B.S. or B.D.Sc., not D.D.S. as at present. It has not yet been determined which of the two degrees will be offered, but the one to be selected will be awarded for the first time in 1932

(B) The combined academic and dental curricula ("2-4 plan"), which have been offered and optional since 1924-25, afford a more advanced general education and a broader professional training for general practitioners than curriculum A, above. Graduates will receive the B.S. degree (optional and non-professional) and the conventional D.D.S. degree, at the end of the third and fourth professional years, respectively. This plan will probably be discontinued after the 2-5 plan (D, below) becomes fully effective

(C) Special one-year graduate curricula are about to be instituted — 1925-26: (a) for graduates of the 0-4 curriculum, or its equivalent, leading to the M.S. or M.D.Sc. degree; (b) for graduates of the 2-4 curricula, leading to the D.D.Sc. degree

(D) The general program includes an additional combination similar to that of the 2-4 undergraduate curricula plus a one-year graduate curriculum (B and C, b, above) — a 2-5 plan, leading to the B.S. and M.S. degrees (optional and non-professional) at the end of the third and fourth professional years, respectively, and the D.D.Sc. degree, at the end of the fifth professional year. The first six years will be practically identical with those of the combined 2-4 curricula. "The last year will be spent as an interne or in research in any one of several fields of professional activity. It is not intended that the graduate will be prepared to engage in practice as a specialist," but he will be "encouraged to associate with a specialist in his field"

Graduates of the 0-4 curriculum will be "dentists"; those of the 2-4 or 2-5 curricula will be "doctors in dentistry." On the 0-4 plan, the baccalaureate, obtained by "majoring in dentistry," will have a professional import. On the 2-4 or 2-5 plan, however, the baccalaureate will be a symbol of academic work, not of professional ability

[This program differs from the two-three-graduate plan (a) in basing a curriculum for general practitioners directly on a high school education and (b) in making six years instead of five, after graduation from a high school, a minimum requirement for the degree of D.D.S. On the California plan (if state boards of dental examiners accept B.S. or B.D.Sc. as a professional degree), admission to the independent practice of dentistry would be attainable, without study at an academic college, in four years after graduation from a high school; on the two-three-graduate plan, five years includ-

ing two at an academic college would be required. All of the graduate aspects of the California program are included in the two-three-graduate plan. The California program would foster two standards of preparatory education and three of professional training for *general* practitioners; the two-three-graduate plan would aim to maintain one minimum grade of each. On the California procedure, important educational and professional distinctions would be encouraged in the least advanced phases of general practice; on the two-three-graduate plan, controllable differences would be restricted to the most-difficult aspects of oral specialization]

Number of graduates (1882-1925): 1276; average per year, for forty-four years, 29

Average total attendance, per year (at the *end* of the year), for the past ten years (1916-25): 292; proportion from California: 1922-23—95 per cent; 1923-24—92 per cent; 1924-25—89 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—6200; 1921-22—6446; 1922-23—8087; 1923-24—9234; 1924-25—9532

Number of visits, sittings, or operations: 1920-25—no available data

Number of patients treated in the Homes and Hospital, by dental students under the supervision of representatives of the Dental School (1920-25): intermittent service; no records were kept of the number. All residents were cared for, except those in the Relief Home, where only extractions and emergency service were performed

Rated Class A by the Dental Educational Council of America (September 15, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$204,289, and equipment, \$117,184; total, \$321,478 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): \$24,233 at 6 per cent interest per annum

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Surplus used during the year (The surplus for 1919-20 was \$605)	None	\$3,311	None	None
Fees (all kinds) paid by the students	\$63,844	85,128	\$93,808	\$99,337
Fees paid by patients, in all clinical departments	35,216	41,239	65,435	77,307
Interest on endowment	None ²	None ²	None ²	549
Gifts (for research)	1,000	1,200	2,277	14,834
Borrowed during the year (from the University)	None	55,528	24,554	None
Miscellaneous receipts	1,778	172	453	2,863
University funds, additional to the income designated above:				
(a) Direct appropriation	10,376	10,272	10,042	10,000
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	None	None	None	1,320
Total amount of current income	\$112,214	\$196,850	\$196,569	\$206,210

¹ During the academic years 1920-24, there was no appropriation by the State directly or by the City, and all miscellaneous receipts are included in the recorded items above.

² Not used as current income, but added to the principal of the endowment in three successive annual portions: \$414, \$465, and \$472. See footnote 1, on page 268.

DENTAL SCHOOLS IN THE UNITED STATES

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Total amount of current income, brought forward</i>	\$112,214	\$196,850	\$196,569	\$206,210
<i>Total amount of current expenditures</i>	\$105,088	\$196,850	\$195,873	\$203,106
Surplus for the year ^{1,2}	7,126	None	696	3,104
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	3,250	10,272	9,346	8,216
Average amount expended by the School per student (D.D.S.) per year	326	397	461	471
Average amount of all student fees paid to the School per student (D.D.S.) per year	198	223	221	230
<i>Details of expenditures :</i>				
For reduction in principal of debt; paid to the University	22,863	None ³	None ³	10,848
For interest on debt	1,372	None	757	2,066
For rent	None	None	None	None
For repairs ⁴	None	None	None	None
For new equipment	. . . ⁵	50,162	8,241	5,320
For new construction (or land or both) ⁶	None	45,745 ³	49,043	957
For research	None	1,492	2,716	14,737 ⁷
For improvement of the library	381	878	1,330	589
For supplies used in the clinical departments	No available data			
For salaries : for administration	6,185	7,210	7,400	11,843
For salaries : for teaching	39,241	47,366	60,475	88,628
For all other purposes ⁸	35,046	43,997	65,911	68,118
<i>Salaries for instruction :</i>				
(Number of teachers of dental subjects)	(37)	(62)	(73)	(91)
Amount of their salaries as teachers	34,051	40,066	52,475	75,928
Number of teachers of dental subjects who did not receive salaries	(22)	(19)	(17)	(12)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	4,000	3,333 ⁹	5,000	6,500
Smallest salary paid to a whole-time teacher of a dental subject	1,800	1,800	1,800	1,800
(Number of teachers of academic or medico-dental subjects)	(14)	(13)	(13)	(13)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	5,190	7,300	8,000	12,700

¹ On June 30, 1923, the sum of \$1093.01 — nearly all of the unexpended surplus — was used to raise, to \$10,000, the principal of an endowment for the support of a series of annual lectures on preventive dentistry. The Alumni Association proposes to double the amount of this principal.

² "In 1921 the Regents loaned the School \$45,745, for alterations and new equipment. This was written off from the surplus for the years 1921-22 and 1922-23."

³ See footnote 2.

⁴ Made by the University; amount unrecorded.

⁵ No available data.

⁶ Approximately \$35,000 of the expenditures in 1921-22 were for construction, the balance for land. All of the expenditures on this item in 1922-23 were for land; in 1923-24, for new construction.

⁷ The expenditure for research during 1924-25 was \$16,294.

⁸ See footnote 2.

⁹ Two-thirds of the salary, during a sabbatical leave of absence.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	\$6,000	\$6,000	\$6,000	\$6,000
In the Medical School	7,000	7,000	7,000	7,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	None	1,800	2,000	2,200
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the allotment referred to above)	None	None	None	1,320

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 103. Of this total number, none were whole-time, none half-time, and 11 part-time or occasional teachers of academic or medico-dental subjects; 15 were whole-time, 11 half-time, and 66 part-time or occasional teachers of dental subjects; 6 taught both general types of subjects; 13 were whole-time teachers in the Dental School only; 6 were "full" professors; 6 were associate, assistant, or clinical professors; 1 was a lecturer by title; 10 received no salaries; 24 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. (five years) and D.D.S. (six years): since 1924; attendance: 1924-25 — 10; 1925-26 — 16

Course for dental hygienists: since 1918; attendance: 1921-22 — 7; 1922-23 — 10; 1923-24 — 14; 1924-25 — 5

Regular intersession and summer courses in the medico-dental, technical, and clinical aspects of dentistry (May, June, and July): since 1922; attendance: 1922 — 156; 1923 — intersession, 238, summer session, 128, total, 366; 1924 — intersession, 211, summer session, 148, total, 359; 1925 — intersession, 195, summer session, 122, total, 317

STUDENTS AND GRADUATES : COLLEGE OF DENTISTRY, UNIVERSITY OF CALIFORNIA

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	182	230	337	393	462	448
Women.....	9	11	20	17	16	16
From other countries; chiefly from Canada and South America.....	2	5	5	9	13	13
Negroes.....	0	0	4	4	4	3
Attendance at the end of the year.....	173	210	322	381	425	431
Admitted after examination.....	4	2	3	2	1	0
Admitted to advanced standing.....	3	3	5	1	3	2
From other countries, to advanced standing.....	0	0	0	1	1	2
"Repeaters" of one or more subjects.....	41	58	77	107 ¹	140	81
Denied further instruction because of deficient scholarship.....	0	0	0	5 ²	8	9
GRADUATES (D.D.S.)						
Total number of graduates.....	62	14	35	43	69	79
Women.....	3	0	4	2	5	6
Admitted to practice in other countries.....	0	0	1	0	0	0
Negroes.....	0	0	0	0	0	1
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	1	1	1	1	1	2
Percentages of failures in such state-board examinations.....	0	7.1	11.4	7.5	2.9	3.8

¹ Enforcement of the prerequisite rule was begun in 1921.

² Enforcement of the unit-disqualification rule was begun in 1921.

Dental extension teaching: correspondence courses in oral hygiene; by the Extension Division of the University since 1916. In 1923 classes in crown and bridge prosthesis were organized by three district dental societies, which, although not under the supervision of the University or School, were taught by the Professor of Crown and Bridge Prosthesis and his assistants at weekly intervals during the academic year 1923-24; no fees were charged but expenses were paid

No course for dental mechanics, assistants, or technicians (since 1922); no graduate courses (to be begun in 1925-26); no advanced course for dental practitioners

Research: actively in progress in 1924-25, on the effects of nutritional disturbances upon the structure of the teeth and the etiology of dental caries; anatomical structure of salivary glands as shown by the celluloid injection method; radium therapy in peri-apical infections; numerous publications in 1924 and 1925

With the cooperation of the Warden of San Quentin, research, relating to diseases of the oral cavity and to metabolism, has been conducted by officers of the Academic Departments and the Medical and Dental Schools, in collaboration, on the possible relation of calcium precipitating bacteria to pyorrhea alveolaris; presence and possible rôle of anaerobic bacteria in dental infections; protozoa of the mouth in relation to otitis media; bacterial flora of the feces of men on restricted diets of varying calcium content; mineral metabolism under different dietary conditions; inorganic constituents of human saliva; parasitology of the mouth in relation to pyorrhetic conditions; clinical effects obtainable through instrumental treatment of pyorrhea, with and without medication; comparative studies of the histo-pathology of inflammation resulting from pyorrhea, trauma, scurvy, and Vincent's angina; studies of dental caries; ceramic materials for dental use; substitutes for gold and platinum in dentistry; oral focal infections. A summary of the results will be published in the *Journal of Dental Research*, in 1926

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: beginning in 1910, a systematic endeavor has been made to place dental graduates in various institutions, including public schools, hospitals—especially teaching hospitals, state and county—and institutional clinics of various sorts, such as health centres and industrial clinics. This effort was directed primarily toward the organizations themselves, to create a demand for dental service and a desire to have it established continuously. The results have been highly satisfactory in this regard and continue to develop. The effort to place licensed graduates in communities has been more difficult of accomplishment. By means of public instruction in the various communities, the demand for good dental service has been created and such communities are requested to notify the University of their needs. During the second semester of the senior year, when instruction is given in dental economics, the various problems confronting the young dentist in establishing a practice are outlined in lectures. The opportunities for practice are presented to the graduating class in a general way, and they are requested to confer with the Dean individually with regard to these opportunities. Many communities of from 800 to 2500 people in California have no dentists

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research, except to judge by their professional accomplishment and reputation, and their interest and participation in civic affairs in their respective localities

Visited: April, 1922

The foregoing data have been verified in detail by the Dean

SUMMARY

THIS is the only dental school in a state university that continues to base its D.D.S. curriculum directly on a high-school education, or which has not announced its purpose to raise its minimum entrance requirement, beginning in 1926-27, to a year of approved work in an accredited academic college. Although representatives of the School cooperated in the organization and maintenance of the Dental Faculties Association of American Universities, the School declined to join the other members of that Association in 1921 when they began to enforce this requirement in preliminary education. The reason for the School's disagreement with the policies of the other state universities, and of all of its former associates in the Dental Faculties Association of American Universities, is suggested by this statement in the pamphlet setting forth the School's "plan for dental education" (page 266): "It is quite generally conceded in the dental profession that the largest part of dental service rendered to-day is reparative and is rather simple in character demanding only a general knowledge of medical science and a high degree of technical skill. . . . If 80 per cent of dental practice consists of repairing [teeth] or replacing lost teeth or parts thereof, of simple extraction and mouth hygiene, why train persons longer than is required to teach them to render such service?" If the same principle were applied to surgical service, the University of California would not require of prospective rhinologists, otologists, ophthalmologists, and similar practitioners, three years of work in an academic college for admission to the Medical School.¹ It is conceded by physicians that the diagnosis of most cases of sickness is "easy" and their treatment "simple"—"Nature effecting the cure." The proposal to use a baccalaureate as a professional degree for general dental practitioners is considered on page 202.

The work of the School is greatly handicapped not only by the inability of the teachers of the medical sciences at Berkeley, twelve miles distant, to cooperate in the instruction of dental students,² but also by the unconcern for the correlations between clinical

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF CALIFORNIA: 1924-25

<i>States (16), territory (1), and foreign countries (11)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
California	76	90	91	103	360
Canada	0	0	0	3	3
Hawaiian Islands	0	1	0	2	3
Idaho	1	0	0	2	3
Utah	2	1	1	1	5
Washington	2	2	0	1	5
Australia, Colorado, Finland, France, Germany, Illinois, Indiana, Iowa, Massachusetts, Mexico, Minnesota, Missouri, New Zealand, North Dakota, Scotland, Sweden, Switzerland, Texas—one each	3	5	4	6	18
Denmark, Michigan, Nevada, Oregon—two each	2	2	0	4	8
Total	86	101	96	122	405

¹ In thirty-nine states at least two years of pre-medical work in an academic college are included among the statutory prerequisites for admission to the medical license examination, but in California only one pre-medical academic year is exacted. Nevertheless, the study of medicine at the University of California is based on three years of "collegiate preparation . . . including the work represented by the three-year pre-medical curriculum of this University," and the Medical Faculty is authorized, in addition, "to refuse admission to students who have a low academic record." The University of California exacts very high academic requirements for admission to the study of medicine, but adheres to the lowest for dentistry. The extreme educational disparity between the Medical and Dental Schools is impressive.

² In December, 1911, "the Regents of the University announced their intention of bringing together the various departments of the Medical School." In April, 1912, "it was resolved to consolidate all departments of the Medical School in San Francisco as soon as feasible." In March, 1921, "the Regents reaffirmed their decision to consolidate all departments of the Medical School in San Francisco as soon as possible."

medicine and clinical dentistry in the instruction of medical and dental students, which seems to be shared equally by the Medical and Dental Schools. The Medical School has neither required its students to take courses in odontology, stomatology, clinical dentistry, or oral surgery, nor offered elective work in any aspect of oral health-service. This might seem to imply that the Medical Faculty uses the undergraduate curriculum for the intensive training of general practitioners only, and wisely excludes redundant instruction in the specialties, but an examination of the curriculum shows generous reservations for the various specialties that usually overcrowd the third and fourth medical years. There are many departments in the University Hospital and in the affiliated San Francisco Hospital, but, although there is a dental externe in each, dentists are not named on the register of the staff of either. Although the School's "plan for dental education" includes six-year and seven-year curricula for "doctors of dentistry," to be distinguished from "dentists" on a lower grade of preparation, discerning students will hardly be attracted to the University for advanced study in oral health-service while these conditions of discoördination prevail, but will probably prefer graduate curricula, or combined medical and dental curricula, in universities where medical and dental schools are intimately coördinated not only in the laboratories for the medical sciences but also in all other aspects of their related work.

From about 89 to 95 per cent of the number of dental students during the past four years were Californians. The geographical distribution of the students, in 1924-25, is shown by the data in the table on page 271. Comparative data relating to students, graduates, and results of license examinations, are given on pages 279-280.

The latest cumulative record of the results of license examinations indicates that during the past sixteen years (1910-25) the graduates of this School passed their initial tests in but three states besides California. Since 1918 only one of the graduates appears to have been admitted to practice elsewhere than in the United States (page 269). During 1910-25 the proprietary Texas Dental College was the only dental school, in existence in the United States throughout this period, that received its students from a smaller number of states, although a larger number of its recent graduates seem to have been admitted to practice in other countries. The growing tendency among graduates of dental schools to take their initial license examinations in states where they obtain their professional degrees may explain the indicated limitations in the influence of the Dental School of the University of California. That it is not due to conditions peculiar to membership in a state university is suggested by the fact that, during 1910-25, graduates of the Dental School of the University of Illinois, for example, took their first license examinations in twenty-four states, and also that, since 1918, twenty-four graduates of the Illinois School were admitted to practice in other countries than the United States. The very small number of Canadian dental students at the University of California contrasted with the comparatively large number at North Pacific College of Oregon is a complete reversal of the conditions that might be expected, judging solely from the superior general reputation of the University.

The coördinated research in various departments of the University, by Dr. F. V. Simon-ton of the Dental Faculty and many collaborators, with the coöperation of Warden Johnston of the San Quentin Prison and the assistance of the prisoners there (page 270), is the most comprehensive investigation now in progress in dentistry. For the development of this research, under the auspices of the Regents of the University, the Carnegie Corporation on October 30, 1923, voted a grant of \$85,000, to be paid in annual instalments of \$10,000 to \$25,000 during a period of five years (1923-28), provided that at least \$20,000 would be added by the Regents during the same period, and also that, in the judgment of an advisory committee reporting annually, the conduct and results of the proposed research justified continuance of the support. Thus far at least twice the minimum amount has been obtained by the Regents. This special fund for the promotion of dental research

at the University of California, and in recent years the grants by the Research Commission of the American Dental Association (page 160) and by other organizations to workers in the Dental School for similar purposes, stress the important fact that the amounts of the fees paid by the students and by the patients are inadequate for the conduct of all of the work that a first-class dental school should undertake.

The School is providing facilities for graduate work in dentistry, beginning in 1925-26, especially in clinical oral surgery and advanced orthodontia, which have also been made elective subjects for undergraduates (seniors). The courses of the intersession and summer session, which since 1922 have been developed to an unusual degree of usefulness, afford special opportunity, from about May 10 to July 31, to remove deficiencies, to obtain advanced credit, and to do graduate work. The large attendance (page 269) and the general success of the summer courses in dentistry at California add pertinence to the suggestion (page 206) that some or all of the years on the two-three-graduate plan might be suitably lengthened, where desired, by prefixing summer sessions (summer "quarters").

The number of patients increased 25.5 per cent in 1922-23 and 43.3 per cent in 1923-24, over the number for 1921-22, but the receipts from fees paid by the patients increased 58.7 per cent and 87.7 per cent, respectively. This added income, together with that from tuition fees, facilitated repayment of borrowed funds, and also favored increases in the total appropriations for salaries for instruction and for new facilities without added expense to the University, although in 1923-24, thirteen teachers of academic or medico-dental subjects, exclusive of the Dean, were paid only \$12,700, and 92 teachers of dental subjects received but \$75,928. In 1924-25 the total amount of salaries for instruction was \$5660 greater than the year before, practically all of the increase having been paid to the teachers of academic and medico-dental subjects, seventeen of whom received \$18,300. During 1921-23 a debt of \$45,745 was paid from the surplus for these years. This has not been shown in the tabulation on page 268.

(2) DENTAL DEPARTMENT, COLLEGE OF PHYSICIANS AND SURGEONS

Location: 344 Fourteenth Street; one mile from the centre of the city

General character: independent and non-proprietary

Organized: in 1923. The College of Physicians and Surgeons was founded in 1896, as a proprietary institution, with departments of medicine, dentistry, and pharmacy. In 1918 the departments of medicine and pharmacy were discontinued, and the College was maintained as a School of Dentistry. A special course in pharmacy was given, until 1923, for students "desiring to take the examination of the State Board of Pharmacy." On September 1, 1923, the College was reorganized as a public trust, under its old name, but as a school of dentistry exclusively. Since its reorganization, the School has been controlled by a Board of Trustees having five members, each of whom signed for himself and his successors a waiver of all personal equity in the institution

Building: erected in 1906; special improvements were made in 1916 and 1922; total floor area, 46,450 sq. ft.

Infirmary: with two accessory rooms; total floor area, 7683 sq. ft. Total number of chairs in active use, 106, including groups reserved for special purposes: orthodontia and ceramics, 18; prosthodontia, 8; oral surgery, 6; roentgenography, 1

School of Medicine: associated with none

Dispensary or Hospital in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: none. At present (1925-26) each senior spends a Saturday morning monthly at Mary's Help Hospital (two blocks), to witness operations and observe surgical technique (one hour), and to perform dental service in

the Out-Patient Department of the Hospital (three hours), where five of the officers of the School are dental externes

Library: room, 720 sq. ft.; part-time librarian. Contains about 5000 bound and 300 unbound volumes, and 2000 pamphlets (all effectively card indexed). Of the volumes, approximately 600 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Library of the San Francisco Medical Society (one mile); not in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25; twenty-five students; total amount, \$8535, which was provided by the U. S. Bureau for Vocational Training and by the State of California; \$250 by the School

Dean: half-time officer; also Professor of Operative Dentistry. *Superintendent of the School*: whole-time officer; also Associate Professor of Operative Dentistry. *Secretary-Registrar*: whole-time officer; also Instructor in English

Minimum academic requirement for admission to the first-year class, in August, 1924: graduation from an accredited high school or academy (15 units), including the principal's recommendation; or a certificate of matriculation in the first-year class of the Academic College of the University of California, of Stanford University, or of a university of equal standing; or a certificate of successful examination in at least 15 standard high school units before the College Entrance Examination Board; or certificates, in a number not to exceed 10 per cent of the total enrolment of the class, issued by the State Superintendent of Public Instruction (since 1923)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in August, 1926

The School will lengthen its curriculum to five years, the first of which will be devoted to academic subjects, including several courses to test vocational aptitude; and full-year graduate curricula will be inaugurated. Students who have completed the equivalent of one year of approved work in an accredited academic college will be admitted to the second year of the five-year curriculum. Qualified students will receive the B.S. degree at the end of the fourth year, D.D.S. at the end of the fifth year. The M.S. and D.D.Sc. degrees will be awarded to successful graduate students. The new program appears to be the first instance in which an independent school raised its requirements for a professional degree higher than those of the state university

Number of graduates (1924-1925): 133; average per year, for two years, 67. (Number during the proprietary period, 1897-1923: 904; average per year, for twenty-seven years, 33)

Average total attendance, per year (at the end of the year), for the past two years (1924-1925): 334; proportion from California, 1923-24—94 per cent; 1924-25—93 per cent. (Average for the last ten years of the proprietary period, 1914-23: 184; proportion from California in 1922-23—94 per cent)

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—3729; 1921-22—4063; 1922-23—4319; 1923-24—7226; 1924-25—7211

Number of visits or sittings: 1920-21—33,095; 1921-22—36,160; 1922-23—38,291; 1923-24—64,132; 1924-25—63,998 (the figures are estimates)

Rated Class B by the Dental Educational Council of America (September 15, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value of land and building—owned by the preceding Dean, and occupied by the College as a tenant (June 30, 1925): \$120,000

Estimated value of equipment¹—all owned by the College (June 30, 1925): \$40,830
 General debt on the College (June 30, 1925): \$42,064 at 6 per cent interest per annum
 Accumulated net assets (June 30, 1925): \$96,510

Data for four years, each of the first three ending on December 31; the fourth, on June 30	(1) 1920 (During the proprietary period)	(2) 1921	(3) 1922	(4) 1923-24 ²
<i>Current income:</i> ³				
Surplus used during the year (Surplus for 1920 was \$12,633)	None	\$4,028	\$243	None
Fees (all kinds) paid by the students	\$31,032	37,594	45,912	\$64,232
Fees paid by patients, in all clinical departments	28,270	31,834	30,003	49,457
Miscellaneous receipts	None	None	None	1,258
Total amount of current income	\$59,302	\$73,456	\$76,158	\$114,947
<i>Total amount of current expenditures</i>				
Net income for the year (see amounts below, paid for "rental arrears")	2,277	None	None	44,314
Surplus paid to the owner	2,277	None	None	... ²
<i>Capital expenditures (since reorganization):</i>				
For reduction in principal of debt on equipment	...	...	...	4,675
For new equipment	...	...	...	3,191
For new construction (no land)	...	...	...	1,021
Total	...	...	...	8,887
Average amount expended by the School per student (D.D.S.) per year	354	313	263	219
Average amount of all student fees paid to the School per student (D.D.S.) per year	193	160	158	199
<i>Details of current expenditures:</i>				
For "rental arrears," paid to the preceding Dean, the owner of the property	4,800	8,400	4,200	...
For interest on debt	None	None	None	2,400
For rent (to the preceding Dean, the owner of the building)	6,600	3,000	7,200	6,000
For repairs	3,928	3,510	5,320	1,660 ⁴
For equipment				
For new construction (no land)	None	None	4,748	... ⁵
For research	None	None	None	None
For improvement of the library	None	105	None	30
For supplies used in the clinical departments		No available data		14,847
For salaries: for administration	7,800	6,045	11,700	3,000
For salaries: for teaching	23,020	26,600	31,390	19,475
For all other purposes	10,877	25,796	11,600	23,221

¹ At the time of the reorganization, the new corporation purchased the equipment of the proprietary School for \$40,000. During the succeeding nineteen months (to April 1, 1925), \$9399 was expended for new equipment. Depreciation to the amount of \$7916 was charged against the equipment account for the same period.

² For the ten months beginning on September 1, 1923, when the School ceased to be proprietary.

³ During the four years indicated, there was no appropriation by the State or City, and no income from endowment, investment, or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

⁴ For repairs only. See "Capital expenditures," above.

⁵ See "Capital expenditures," above.

Data for four years, each of the first three ending on December 31; the fourth, on June 30	(1) 1920 (During the proprietary period)	(2) 1921	(3) 1922	(4) 1923-24 ¹
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(28)	(32)	(35)	(47)
Amount of their salaries as teachers	\$15,390	\$18,088	\$20,617	\$11,703
Number of teachers of dental subjects who did not receive salaries	(18)	(20)	(21)	(37)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	2,000	2,000	3,000	4,000
Smallest salary paid to a whole-time teacher of a dental subject	1,000	1,000	2,000	1,500
(Number of teachers of academic or medico-dental subjects)	(12)	(14)	(15)	(12)
Amount of their salaries as teachers	7,630	8,512	10,773	7,772
Largest salary paid to a whole-time teacher of an academic or medico-dental subject			(No whole-time teacher of these subjects during the proprietary period)	2,250
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject				1,250

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 73. Of this total number, 2 were whole-time, 1 was a half-time, and 15 were part-time or occasional teachers of academic or medico-dental subjects; 4 were whole-time, 3 half-time, and 4¹ part-time or occasional teachers of dental subjects; 12 were "full" professors; 12 were associate or assistant professors; 10 were lecturers by title; 51 received no salaries; 10 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

STUDENTS AND GRADUATES: DENTAL DEPARTMENT, COLLEGE OF PHYSICIANS AND SURGEONS

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	143	123	163	239	296	324
Women.....	2	2	3	4	3	3
From other countries; chiefly from Central America, and the Philippine and Hawaiian Islands.....	16	6	6	4	4	3
Negroes.....	0	0	3	3	3	0
Attendance at the end of the year.....	133	121	161	235	290	322
Admitted after examination.....	3	11	20	67	41	0
Admitted to advanced standing.....	2	5	4	7	5	1
From other countries, to advanced standing.....	0	2	2	0	0	0
"Repeaters" of one or more subjects.....	7	14	6	19	13	22
Denied further instruction because of deficient scholarship.....	0	1	0	2	9	3
GRADUATES (D.D.S.)						
Total number of graduates.....	69	17	45	24	32	48
Women.....	2	0	1	1	0	2
Admitted to practice in other countries.....	4	2	1	0	0	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	2	1	1	2	1	2
Percentages of failures in such state-board examinations.....	23.6	21.4	23.0	30.4	6.6	8.3

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1925; now six years in length. Open to students who have completed two years of approved work in an

¹ For the ten months beginning on September 1, 1923, when the School ceased to be proprietary.

accredited academic college. The B.S. degree will be awarded by the Dental School at the end of the third professional year. There are now three candidates for the two degrees (December, 1925)

Summer courses in clinical dentistry (May to August, inclusive): since 1914; attendance: 1922—16; 1923—22; 1924—50; 1925—65

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: actively in progress in 1924—25, on the relation between gastric hyperacidity and the formation of calculus on the teeth;¹ one publication in 1924, none in 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

On February 20, 1925, the Executive Committee of the Alumni Association of the School perfected plans for the establishment of a "Lecture and Postgraduate Foundation," with a central office and a whole-time secretary in charge. On May 23, 1925, the Alumni Association voted to accept the plans of its Executive Committee, and are pledging and subscribing funds for the permanent support of this activity. Through this agency the Alumni Association will systematically cooperate with the School in placing graduates where dental service is most needed; in determining recurrently the quality of the School's instruction, as measured by the success and efficiency of the graduates in dental practice, teaching, and research; in promoting advanced study and professional activity among the alumni; and in furthering oral health-service in general

Visited: April, 1922

The foregoing data have been verified in detail by the Dean

SUMMARY

THE College of Physicians and Surgeons was a group of unacceptable schools of medicine, dentistry, and pharmacy when its medical career came to an end in 1918. Continuing under a misnomer as a dental school, it was seriously deficient when in 1923 its present Trustees converted it into a non-proprietary institution, and, in deference to the wishes of the alumni, reorganized it under the old corporate title. The preference of the graduates in such instances is obviously an important consideration and cannot easily be disregarded, but as the School is neither a medical school, nor a dental school associated with a medical school, its diploma tends to suggest relationships with medical training that have not yet been realized. Fortunately, the Trustees, all of them members of the Faculty, are endeavoring to make the School worthy of admission to a university. Success of their effort to bring about such a union would automatically dispose of the present name.

The new administration has introduced many improvements, and is showing an unusual degree of altruism. The Faculty, in an unselfish endeavor to strengthen the School financially with resources that have not yet been obtainable from direct gifts, is cheerfully serving on a low scale of remuneration, with the knowledge that the surplus which it thus helps to accumulate will not only fortify the work of the School in emergencies, but also become a fund for the support of dental education in the university with which the teachers hope the School may be united, and to which they would surrender it and its assets unconditionally. The surplus thus derived since the reorganization in 1923 amounts to approximately \$100,000 (1925). In 1923—24, thirty-seven teachers served without remuneration, and the remaining twenty-two were paid \$19,475, of which twelve teachers of academic

¹ The Board of Trustees of this School have contributed \$800, payable in four equal annual instalments (1925—28), for the support of the dental research now in progress at the University of California (see "Research," page 270).

or medico-dental subjects received only \$7772. In 1924-25, fifty-one teachers were without salaries, and the remaining twenty-two were paid \$37,847, of which eighteen who taught academic or medico-dental subjects received only \$11,220. The Trustees recognize the difficulty of maintaining competent instruction on salaries as small as these, but believe that by careful selections they are protecting the interests of the students and patients during the temporary continuance of the plan of accumulating resources through the voluntary sacrifices of the teachers. This situation should appeal strongly to the generosity of public-spirited citizens of San Francisco, the chief beneficiary of the School's continuance. The School's contribution of \$800 to the fund raised by the Regents of the University of California, to supplement the grant of the Carnegie Corporation in support of dental research (page 272), was a praiseworthy act of coöperation.

The data in the accompanying table for the geographical distribution of the students, in 1924-25, indicate that 93 per cent were Californians, that most of the non-resident students came from the Hawaiian and Philippine Islands, and that there was only one non-resident student in the first-year class. Comparative data relating to students, graduates, and results of license examinations, are given on pages 279-280.

During the past sixteen years (1910-25), the graduates of this School and of its proprietary predecessor have taken their first license examinations in only four states. Like the College of Dentistry of the University of California, this School's influence is essentially local. So long as the School remains independent and is obliged to subsist on fees, its

GEOGRAPHICAL DISTRIBUTION OF THE STUDENTS AT THE DENTAL SCHOOL OF THE COLLEGE OF
PHYSICIANS AND SURGEONS OF SAN FRANCISCO: 1924-25

<i>States (9), territories (2), and foreign countries (5)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
California	75	79	84	87	325
Hawaiian Islands	0	3	1	2	6
Mexico	0	0	0	2	2
Nicaragua	0	1	1	0	2
Philippine Islands	0	2	1	0	3
Colorado, Guatemala, Indiana, Ireland, Japan, Louisiana, Maine, Montana, Nevada, Ore- gon, Pennsylvania, Spain— one each	1	5	1	5	12
Total	<u>76</u>	<u>90</u>	<u>88</u>	<u>96</u>	<u>350</u>

academic requirement for admission and its educational standards in general could not be expected to rise above those for dentistry at the State University. Beginning in August, 1926, however, and regardless of the prospective loss in the number of students, the School will require, for the degree of D.D.S., one more year of study after graduation from a high school (0-5) than the State University (0-4). The School's earnestness could hardly be shown more persuasively. Union of the School with Stanford University, and its intimate coördination with the Medical School and Hospital in San Francisco, would seem to be a logical as well as a desirable development in dental education in California, but such an important advancement could not be made without special gifts of funds to promote it. It is to be hoped that the public and the dental profession in San Francisco and California will find a way to provide the means.

The plan to lengthen the curriculum from four years to five years, to include a year of academic training, is intended to be a temporary arrangement during a period of transition. The Trustees realize that this plan cannot be continued successfully in an independent dental school. A well-advised student intending to enter the School will complete at least two years of approved work in an accredited academic college, and seek admission to advanced standing in the third year of the five-year curriculum by taking, in summer sessions, the necessary additional courses of the first-year and second-year curricula, which the School will conduct to facilitate this program.

GENERAL COMMENT

THE only dental schools in the eleven states that comprise the Pacific and Rocky Mountain groups, besides those in California, are one in Colorado and one in Oregon. California has a larger relative number of dentists than any other state, and the need for low educational standards to expedite the multiplication of dentists is less urgent there than in any other part of the United States. Nevertheless, the three California dental schools have been basing their four-year curricula on a high-school education — the lowest current standard — and until recently have objected to the requirement of a higher quality of preliminary education. The situation in medicine has been very different. Two of the three California medical schools exact three years of approved work in an accredited academic college for admission and one requires two years, but the medical statute enforces only one year. In California, a new dental leadership is arising, however, which aims to make oral health-service equal in quality to a specialty of the practice of medicine.

DATA PERTAINING TO THE DENTAL SCHOOLS IN THE STATE OF CALIFORNIA: 1919-26

Total attendance

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
California	210	322	381	425	431	385	359
College of Physicians and Surgeons	121	161	235	290	322	348	290
Southern California	225	322	451	539	556	600	583
Total	556	805	1067	1254	1309	1333	1232

Proportion of students resident in California

California	90	87	88	95	92	89	90
College of Physicians and Surgeons	91	90	92	94	94	93	96
Southern California	60	61	63	60	68	56	64

Number of graduates

California	14	35	43	69	79	80	100 ¹
College of Physicians and Surgeons	17	45	24	32	48	85	79 ¹
Southern California	20	42	42	100	116	133	160 ¹
Total	51	122	109	201	243	298	339

Number of first-year students

California	121	131	120	118	110	84	78
College of Physicians and Surgeons	27	61	118	83	79	76	52
Southern California	106	131	162	153	133	161	145
Total	254	323	400	354	322	321	275

The California dental schools are strong in dental technology and in reparative dentistry, but, lacking intimate association with medical schools and hospitals, are weak in the applications of the academic and medico-dental sciences, and do not teach the correlations between clinical dentistry and clinical medicine as effectually as some of the schools that are more fortunate in this respect. Collectively they exemplify the type of management which, unaided by endowment, endeavors to accumulate property

¹ The number of seniors (December, 1925).

from the fees paid for tuition and infirmary service, by encouraging excessive attendance, and by keeping the expenditures for instruction unduly low.¹ These schools represent three different kinds of organization: (a) an integral part of a university, but poorly coördinated with the medical school; (b) an association with a university that does not contain a medical school; and (c) an independent school. North Pacific College of Oregon, the only other dental school on the Pacific Coast and representing a fourth variety, has a subsidiary school of pharmacy, but otherwise is similar to the schools in California. None of these types equals the school which, as an integral part of a university, is generously supported financially, intimately associated with an academic college and schools of medicine and engineering, and closely coördinated with a hospital and dispensary.

The share of each of the three dental schools in meeting the needs of the state may be inferred from the data in the table on page 279. The total attendance increased annually until 1925-26, when it decreased in the schools collectively and also in each school. Even more significant, especially in the light of certain views endorsed at the recent "Western Dental Conference," are the figures for the number of first-year students, which for the three schools as a group, and for each of the two San Francisco schools, have been decreasing annually since 1921-22.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the California schools who failed, in the number of states indicated by the figures in parenthesis:

1925.—California, 11.8 (2); College of Physicians and Surgeons, 23.5 (1); Southern California, 20.2 (3); U. S. schools collectively, 11.3.

1910-25 (cumulative).—California, 5.4 (4); Southern California, 9.0 (9); U. S. schools collectively, 14.2.

1924 and 1925 (cumulative).—College of Physicians and Surgeons, 18.0 (2); U. S. schools collectively, 11.8.

THE WESTERN DENTAL CONFERENCE of 1925

A "WESTERN Dental Conference," which was intended to represent the six dental schools, the boards of dental examiners, and the chief dental societies, of Alberta, Arizona, British Columbia, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, was held at the College of Dentistry of the University of California, and at the Dental School of the College of Physicians and Surgeons, of San Francisco, on October 26 and 27, 1925, to consider the problems of education, licensure, and practice as they affect this territory and its schools.² The meetings were attended by a total of about forty representatives of seven dental associations, five dental schools, and two state boards of dental examiners. Nearly all of the delegates in attendance were from California and a majority resided in San Francisco. Two of the dental associations and one of the state boards were represented by proxy. Of the thirteen states and provinces named above, nine—Alberta, Arizona, British Columbia, Idaho, Montana, New Mexico, Utah, Washington, and Wyoming—failed to send delegates. After the presentation and consideration of reports, the Conference, with twenty-six to twenty-nine members voting, formally expressed a number of views, among them the following:

¹ A small income from endowment, important gifts for research, and direct payments from general funds or portions of the expenses, qualify the application of this general statement to the University of California.

² The present writer is indebted to Dean G. S. Millberry of the Dental School of the University of California, Chairman of the Conference, for a copy of the official report of the proceedings.

(1) The ratio of dentists to population in the "western district" is adequate at present.

(2) The four-year professional program, based directly on graduation from a high school, is satisfactory.¹

(3) The practice of the dental hygienist should be limited by statute to educational work in public schools and institutions.

(4) Dentists should be admitted to practice in a state by direct examination by its own state board only, and *not on certification*, either (a) by other state boards on reciprocity agreements, (b) or by a national board of dental examiners.

California for the California dentists now on the ground seemed to be the prevailing note. The lack of interest shown by the New York Department of Education in professional conditions elsewhere, as formally expressed for the Department at the annual meeting of the American Association of Dental Schools in March, 1925 (*Proceedings*, pp. 105-113), was cited in extenuation of the provincialism of this special Conference.

COLORADO

Population: 1,012,044. Number of dentists, 756; physicians, 1837. Ratios: dentists to population, 1:1339; physicians to population, 1:551; dentists to physicians, 1:2.4

Statutory requirements. *Dentistry*. — Preliminary education: graduation from an accredited high school. Professional training: graduation from a reputable dental school. *Medicine*. — Preliminary education: two years in an accredited academic college. Professional training: graduation from a legally chartered, reputable medical school

Location of the dental school: Denver; medical school: Denver

DENVER

Population: 278,691. Number of dentists, 376; physicians, 809. Ratios: dentists to population, 1:741; physicians to population, 1:344; dentists to physicians, 1:2.2

Number of dental clinics or infirmaries, 2; hospitals, sanatoriums, and charitable institutions, 27; hospitals approved for internships, 6

Dental School: University of Denver. *Medical School*: University of Colorado

SCHOOL OF DENTISTRY, UNIVERSITY OF DENVER

Location: 1340 Arapahoe Street; one block from the centre of the city

General character: integral part of the University of Denver

Organized: in 1922, by absorption of the affiliated Colorado College of Dental Surgery (1901-22), which was accomplished by the payment of \$25,000 to its six owners. The Dental Department of the University of Colorado was organized in 1896 and was closely affiliated (in Denver) with the Medical Department of that University, but was discontinued in 1897. The faculty of the Dental Department of the State University was reorganized in that year as the Colorado College of Dental Surgery (incorporated). In 1901 the Denver School of Dentistry (which had been organized in 1887 and associated with

¹ Each of the five schools represented at the Conference, excepting that of the University of California, has recently announced the adoption of higher requirements for the D.D.S. degree, beginning in 1926-27, including the addition of one year to the present four-year program.

the University of Denver) was absorbed by the Colorado College of Dental Surgery, and "an agreement entered into with the Colorado Seminary and the University of Denver whereby the Colorado College of Dental Surgery contracted to become the Dental Department of the University of Denver and to conduct said Department for a term of years." This affiliation was continued until June 15, 1922

Buildings: two. The larger of two buildings was erected in 1908; an annex was added in 1913; special improvements were made in 1923; total floor area, 15,099 sq. ft. A smaller adjoining building, erected in 1900 and previously used by the School of Law, has been occupied by the Dental School since 1922; special improvements were made in 1922 and 1923; total floor area, 4290 sq. ft. Total floor area in both buildings, 19,389 sq. ft. Distance from the main site of the University (University Park), seven miles, where some of the academic subjects are now taught to dental students

Infirmary: in the main dental building, with four accessory rooms; total floor area, 5630 sq. ft. Total number of chairs in active use, 71, including groups reserved for special purposes: prosthodontia, 3; extraction and minor oral surgery, 3; examination, 2; crown and bridge and porcelain work, 1

School of Medicine: associated with none

Hospitals in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: Denver County Hospital (one mile), and Children's Hospital (two miles)

Clinical facilities in the Hospitals where dental students received instruction in 1924-25: complete for general surgery and oral surgery

Number of dental internships or externships, held by officers or students of the School, in the Hospitals in 1924-25: none

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: instruction in oral surgery; to teach the relation between oral infections and systemic conditions

Library (in the smaller dental building): room, 1050 sq. ft.; no librarian. Contains 420 bound, no unbound, volumes, and 1200 pamphlets (not card indexed). Of the volumes, approximately 157 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Library of the City Medical and Dental Society (ten blocks); not in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: whole-time officer; also Professor of Crown and Bridge Work and of Oral Surgery. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: Superintendent of the Infirmary (whole-time officer)

Minimum academic requirement for admission to the first-year class, in September, 1924: completion of four years of study in an accredited high school or other secondary school, or its full equivalent (since 1914)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

Number of graduates (1923-25): 127; average per year, for three years, 42. (Number for the Colorado College of Dental Surgery, 1898-1922—639; average per year, for twenty-five years, 26)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 162; proportion from Colorado: 1922-23—66 per cent; 1923-24—63 per cent; 1924-25—68 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—7500; 1921-22—6500; 1922-23—6348; 1923-24—6411; 1924-25—6805 (the figures for 1920-22 are estimates)

Number of visits: 1920-21—22,500; 1921-22—19,500; 1922-23—19,044; 1923-24—19,233; 1924-25—20,415 (the figures are estimates)

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-21—200; 1921-22—200; 1922-23—200; 1923-24—247; 1924-25—295 (the figures for 1920-23 are estimates)

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (Colorado College of Dental Surgery, in 1918), Class B

FINANCIAL DATA

Estimated value (Dental School) of land and buildings, \$40,000, and equipment, \$25,000; total, \$65,000; all owned by the University (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): \$10,000 at 6 per cent interest per annum

	(1)	(2)	(3)	(4)
Data for years ending on the dates indicated in footnotes:	1920-21 ¹	1921-22 ¹	1922-23 ²	1923-24 ²
<i>Current income</i> : ³				
Surplus used during the year	\$2,002	\$1,586	None	None
Fees (all kinds) paid by the students	30,647	31,423	\$41,154	\$34,878
Fees paid by patients, in all clinical departments	26,250	25,552	27,561	26,590
Borrowed during the year	3,308	None	None	None
Miscellaneous receipts (including receipts for supplies)	3,786	27,614 ⁴	19,809	3,782
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	9,020	3,000
(b) Estimated amount of miscellaneous income available to the School as an affiliated or integral part of the University, but not specified in the dental budget	None	None	None	None
Total amount of current income	\$65,993	\$86,175	\$97,544	\$68,250
<i>Total amount of current expenditures</i>	\$64,948	\$86,175	\$94,344	\$74,701
Surplus for the year	1,045	None	3,200	...
Deficit for the year	...	None	...	6,451
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	...	...	None	None ⁵
Surplus paid to trustees or owners	None	None	...	...
Dividend paid to stockholders ⁶	None	None	...	...
Average amount expended by the School per student (D.D.S.) per year	414	437	489	455

¹ For the year ending June 30.

² For the year ending April 30.

³ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment, investment, or gift; and all miscellaneous receipts are included in the recorded items above.

⁴ Includes also "money on notes."

⁵ The Dental School pays \$5 per semester hour per student for all courses taught to dental students in the academic college. For 1923-24, this total exceeded the amount of item (a), under "University funds," above.

⁶ In 1922, when the School was transferred to the University, the stockholders received \$25,000 for the property, and \$9333 for supplies in the store.

DENTAL SCHOOLS IN THE UNITED STATES

	(1)	(2)	(3)	(4)
Data for years ending on the dates indicated in footnotes:	1920-21 ¹	1921-22 ¹	1922-23 ²	1923-24 ²
Average amount of all student fees paid to the School per student (D.D.S.) per year	\$195 ³	\$160 ³	\$213	\$213
<i>Details of expenditures:</i>				
For reduction in principal of debt	3,000	9,000	4,000	None
For interest on debt	53	106	538	900
For rent, to the University of Denver	1,500	1,500	1,700	2,325
For repairs	583	3,272	4,790	2,913
For new equipment	None	None	1,321	172
For new construction (no land)	None	None	800	None
For research	None	None	None	None
For improvement of the library	None	100	None	None
For supplies used in the clinical departments	No available data		6,396	5,745
For supplies sold	3,786	22,658	14,808	3,307
For salaries: for administration	5,000	5,000	4,800	4,304
For additional "office expense"	7,676	7,509	8,530	6,541
For salaries: for teaching ⁴	36,687 ⁴	26,447 ⁴	28,349	35,465
For all other purposes	6,663	10,583	18,312 ⁵	13,029
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(16)	(21)	(34)	(34)
Amount of their salaries as teachers ⁴	20,744	20,330	24,519	23,593
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	3,001	5,295	2,700	3,300
Smallest salary paid to a whole-time teacher of a dental subject	1,200	1,500	1,500	1,500
(Number of teachers of academic or medico-dental subjects)	(9)	(6)	(9)	(17)
Amount of their salaries as teachers ⁴	4,200	2,400	3,830	11,872
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	1,800 ⁶	None	None	3,570
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	...	None	None	1,500
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University	None	None	None	3,000

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 36. Of this total number, 7 were whole-time, none half-time, and 11 part-time or occasional teachers of academic or

¹ For the year ending June 30. ² For the year ending April 30.

³ Although the number of students in 1921-22 was much larger than in 1920-21 — the last two years of the proprietary régime — the total recorded amount paid in fees in 1921-22 was only about \$1000 greater than that for 1920-21. Fees paid by students in the courses for dental hygienists and for dental mechanics also appear to have been included in the totals, in the reports received from the proprietary administration, for each of these two years.

⁴ The figures "for salaries: for teaching," in 1920-21 and 1921-22, which were given by the preceding dean, who was one of the owners, are not the sums of the amounts paid to the two groups of teachers. The present Dean has been unable to correct the data because the former owners have made the earlier records inaccessible.

⁵ Of this amount, \$9333 was paid to the stockholders of the Colorado College of Dental Surgery for supplies that were subsequently sold to students. See "Miscellaneous receipts," above.

⁶ There was one whole-time teacher of such a subject to dental students only.

medico-dental subjects; 9 were whole-time, 2 half-time, and 7 part-time or occasional teachers of dental subjects; 9 were whole-time teachers in the Dental School only; 16 were "full" professors; 9 were associate or assistant professors; none were lecturers by title; all received salaries; 16 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.A. and D.D.S.: since 1924; now seven years in length

No course for dental mechanics, assistants, or technicians (discontinued in 1921);¹ no course for dental hygienists (discontinued in 1921);¹ no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research: in progress in 1924-25, on the application of galalith to dental technology; no publication in 1924 or 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: annual distribution of circular letters to commercial clubs in all

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
	Colorado College of Dental Surgery			University of Denver		
Maximum attendance.....	132	118	204	250	206	173
Women.....	4	3	4	5	2	2
From other countries; chiefly from Japan and Russia.....	1	1	2	3	3	1
Negroes.....	0	0	1	1	1	1
Attendance at the end of the year.....	108	118	157	197	193	164
Admitted after examination.....	1	3	2	17	4	0
Admitted to advanced standing.....	3	2	10	9	3	10
From other countries, to advanced standing.....	0	1	2	1	0	1
"Repeaters" of one or more subjects.....	No available data					
Denied further instruction because of deficient scholarship.....	0	0	0	0	13	2
GRADUATES (D.D.S.)						
Total number of graduates.....	56	11	21	31	41	35
Women.....	1	0	1	2	0	1
Admitted to practice in other countries.....	1	0	0	0	0	0
Negroes.....	0	0	0	0	0	1
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	5	3	1	1	4	2
Percentages of failures in such state-board examinations.....	10.0	3.00	25.0	10.5	7.5	12.1

the cities of Colorado concerning community needs for dental service; efforts to interest seniors in the needy localities thus indicated. The Colorado State Dental Association gathers data concerning community needs for dental service. A member of the Committee in charge of this work addresses the seniors on this subject four times a year. No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: April, 1922

The foregoing data have been verified in detail by the Dean

¹ The course for dental mechanics was discontinued because the attendance was too small; the course for dental hygienists, because room and facilities were lacking.

SUMMARY

THIS School, like those of the Pacific Coast, lacks intimate association with a medical school, but has advantageous relationships with two hospitals. It is located seven miles from the main site of the University, where the dental students receive instruction in some of the academic subjects of the first year. The School needs an adequate building, additional equipment, and a large endowment. The attention of the Faculty is confined to the undergraduate curriculum, the salaries for instruction are insufficient, the library is neglected, and research is slighted, but the School has been greatly improved since the termination of its proprietary management (1922), particularly by the enforcement of its published admission requirements and in the quality of its organization, equipment, and instruction. During the past few years approximately two-thirds of the number of its students have been residents of Colorado, but it is less local in its relationships than the California schools (page 279). A decrease in the attendance during the two years succeeding the termination of private ownership (1922) has been followed by a moderate increase, especially in the number of first-year students during the past two years (page 287).

GENERAL COMMENT

THERE are no dental schools in the adjacent states of Kansas, Oklahoma, New Mexico, Arizona, Utah, and Wyoming (nor in Nevada, Idaho, Montana, North Dakota, and South Dakota), but there are two in eastern Nebraska. The Denver School, situated in the central part of this wide region, has both a growing opportunity and a cumulative obligation. In 1924-25 there were dental students at Denver from each of these states except Oklahoma and North Dakota, the largest number having come from Utah and Kansas. The dental schools nearest to Denver on the west are those of

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF DENVER: 1924-25

<i>States (22) and territory (1)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Colorado	29	19	39	38	125
Kansas	2	3	1	2	8
Nebraska	0	2	1	2	5
Texas	2	2	0	1	5
Utah	1	1	2	5	9
Wyoming	0	1	2	2	5
Arizona, Arkansas, California, Idaho, Indiana, Nevada, New Jersey, New Mexico, New York, Ohio, Philippine Islands, South Dakota, Washington—one or two each	3	4	3	5	15
Illinois, Iowa, Missouri, Montana—three each	3	3	5	1	12
Total	40	35	53	56	184

California; on the east, the two in Nebraska, the one in Kansas City, Missouri, and that of Baylor University in Dallas, Texas. In the territory included within the thirteen states first named above, there are eight medical schools, of which three give only the first two years of the medical curriculum, those in Colorado, Kansas, Nebraska, and Oklahoma offering complete undergraduate curricula.

The accompanying data for geographical distribution, in 1924-25, indicate that the dental students at the University of Denver were drawn from twenty-two states and the Philippine Islands. The official records of the annual results of the license examinations include these comparative data for percentage of the graduates of this School who failed, in the number of states indicated by the figures in parenthesis:

1925—27.9 (2); U. S. schools collectively, 11.3. 1923-25 (cumulative)—16.4 (?); U. S. schools collectively, 11.2.

It seems certain that, in the near future, all of the acceptable dental schools will be not only integral parts of universities but also intimately associated with schools of medicine. The Denver School will be unable to meet its growing responsibilities without such an association. This appears to be attainable either by affiliation or by direct union with the Medical School of the University of Colorado. The creation of a medical school in the University of Denver would be redundant. The history of the medical and dental schools of Colorado suggests that the proposed affiliation or union might be brought about when its importance for Colorado is realized, and when the desirability of conducting medical and dental schools in close association is clearly comprehended. In 1902 the Denver College of Medicine (1881-1902), then nominally a department of the University of Denver, was united with the Gross Medical College (1887-1902) to form the Denver and Gross College of Medicine (1902-11). In 1911 this College was combined with the School of Medicine of the University of Colorado, which had been established in 1883 and since 1924 has been located in new buildings in Denver. In 1897, after the Dental Department of the University of Colorado (1896-97) had been discontinued, its faculty organized the Colorado College of Dental Surgery (1897-1922), which in 1901 absorbed the Dental Department of the University of Denver (1887-1901), and in turn in 1922, after a loose affiliation with the University of Denver (1901-22), became an integral part of that University. This kaleidoscopic medico-dental history, which resulted in the allotment of medicine to the University of Colorado and of dentistry to the University of Denver, suggests that one more turn might develop the relationships that would bring them together in the University of Colorado, and thus permanently serve most effectually the medical and dental needs of the wide region centring on Denver.

That a further evolution in this direction would be fortunate is indicated not only by the obvious desirability of medical affiliations for the Dental School of the University of Denver but also by the fact that the School of Medicine of the University of Colorado, like most medical schools, gives no formal attention to clinical dentistry and to that extent is incomplete as a centre for health-service education. The curriculum of the Colorado School of Medicine contains the usual reservations in the third and fourth years for various specialties, but there is none for oral hygiene, oral pathology, clinical dentistry, odontology, or stomatology, although the School offers a curriculum of graduate courses in ophthalmology leading to the degree of Doctor of Ophthalmology (D.Oph.), and a whole-time dentist divides his service equally between the Psychopathic Hospital, and the Colorado General Hospital and Out-patient Department.

The recent service of the Dental School to the State of Colorado is suggested by the accompanying data relating to the attendance and the graduates.

DATA PERTAINING TO THE DENTAL SCHOOL OF THE UNIVERSITY OF DENVER: 1920-26

	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Total attendance	157	197	193	164	176	180
Proportion of students resident in Colorado	68	66	66	63	68	64
First-year students	46	73	53	30	39	58
Graduates	21	31	41	35	51	45 ¹
Percentage of the graduates who failed in state-board examinations	25.0	10.5	7.5	12.1	27.9	...

¹The number of seniors (December, 1925).

CONNECTICUT

Population: 1,517,562. Number of dentists, 968; physicians, 1884. Ratios: dentists to population, 1:1568; physicians to population, 1:806; dentists to physicians, 1:1.9

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited high school or its equivalent. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: one year of approved work in an accredited academic college. Professional training: graduation from a Class A or Class B medical school

Dental school: none; medical school: Yale University

DELAWARE

Population: 233,654. Number of dentists, 94; physicians, 256. Ratios: dentists to population, 1:2486; physicians to population, 1:913; dentists to physicians, 1:2.7

Statutory requirements. *Dentistry*.—Preliminary education: none. Professional training: graduation from a dental school recognized by the National Association of Dental Examiners. *Medicine*.—Preliminary education: a certificate of qualification for admission to the Latin-Scientific curriculum of Delaware College, or the equivalent. Professional training: graduation from a "legally incorporated" medical school having an approved four-year curriculum of not less than seven months in each year; in addition, one year of interne service in an approved hospital

Dental school: none; medical school: none

DISTRICT OF COLUMBIA (WASHINGTON)

Population: 492,421. Number of dentists, 564; physicians, 1813. Ratios: dentists to population, 1:873; physicians to population, 1:272; dentists to physicians, 1:3.2¹

Statutory requirements. *Dentistry*.—Preliminary education: as required for Class A or Class B dental schools. Professional training: graduation from a Class A or Class B dental school. *Medicine*.—Preliminary education: none. Professional training: graduation from a reputable medical school having a four-year curriculum

Number of dental clinics or infirmaries, 9; hospitals, sanatoriums, and charitable institutions, 36; hospitals approved for internships, 12

Dental Schools: (1) Georgetown University and (2) Howard University. *Graduate Dental Schools*:² (3) U. S. Army and (4) U. S. Navy. *Medical Schools* (3): Georgetown University, George Washington University, and Howard University

(1) SCHOOL OF DENTISTRY, GEORGETOWN UNIVERSITY

Location: 920 H Street; in the centre of the city

General character: integral part of Georgetown University

¹ A large proportion of the physicians in the service of the Government are not engaged in active practice.

² The Army and Navy Dental Schools are exceptions to the plan, stated in footnote 4 on page 257, to omit reference to "post-graduate" schools.

- Organized:* in 1901, by absorption of the Washington Dental College (1897-1901)
- Building:* erected in 1886; used jointly with the laboratory departments of the School of Medicine; special improvements were made in 1901; total floor area used by the Dental Department, 11,470 sq. ft. Distance from the main site of the University, two miles
- Infirmary:* in the medical building, with two accessory rooms; total floor area, 5000 sq. ft. Total number of chairs in active use, 25, including groups reserved for special purposes: prosthodontia, 2; exodontia and roentgenography, 1 each
- Relation of the School of Medicine (Class A):* the medico-dental subjects are taught to dental students in separate classes, by members of the Medical Faculty. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry. The Dean of the Medical School is the Treasurer of the Dental School. This condition has no present relation to the former proprietary status of the Dental School
- Hospitals* in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: Gallinger Hospital (two miles), Georgetown University Hospital (two miles), and the National Training School for Boys (three miles)
- Clinical facilities* in the Hospitals where dental students received instruction in 1924-25: complete at Georgetown University Hospital for general surgery and oral surgery, and at Gallinger Hospital for oral and skin lesions of specific or general origin
- Number of dental internships* (no externships), held by students of the School, in the Hospitals in 1924-25: one
- Nature and specific purposes of the accredited clinical instruction* given elsewhere than in the dental building, in 1924-25: special attention to the recognition and prevention of communicable diseases; to teach oral medicine and surgery
- Library* (primarily medical): room, 522 sq. ft.; no librarian. Contains 1200 bound and 300 unbound volumes, and 1000 pamphlets (all effectively card indexed). Of the volumes, approximately 400 relate to dental subjects
- Library facilities* additional to those in the dental building that are conveniently accessible to dental students: Library of the Surgeon-General's Office (twelve blocks)
- Scholarships, fellowships, or similar financial assistance* received by dental students in 1924-25: two students; total amount, \$375, all of which was provided by the School
- Dean:* part-time officer; also Professor of Dental Medicine and Pathology. *Assistant Dean:* whole-time officer; also Professor of Operative Dentistry and Superintendent of the Infirmary. *Treasurer:* part-time officer; also Dean of the School of Medicine
- Minimum academic requirement* for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (15 units), or its equivalent (since 1906)
- Latest advance* in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1925
- Number of graduates* (1902-25): 406; average per year, for twenty-four years, 17. (Number for the Washington Dental College, 1898-1901—no available data, except two graduates in 1898)
- Average total attendance, per year* (at the end of the year), for the past ten years (1916-25): 127; proportion from the District of Columbia: 1922-23—21 per cent; 1923-24—27 per cent; 1924-25—25 per cent
- Clinical service* of the Dental School in the instruction of students:
 Number of persons treated: 1920-21—3056; 1921-22—3470; 1922-23—4700; 1923-24—6547; 1924-25—5884

Number of visits: 1920-21—6112; 1921-22—10,410; 1922-23—13,100; 1923-24—19,641; 1924-25—17,502 (the figures for 1920-22 are estimates)

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-25—no available data

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value of land and building, \$214,000, and equipment used by the Medical and Dental Schools in common, \$50,000; total, \$264,000 (September 1, 1925). The value of the equipment used exclusively by the Dental School is about \$20,000 (September 1, 1925)

General debt on the School, or carried by the University on the School's account (September 1, 1925): none

Data for years ending on June 30	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$33,554	\$23,917	\$18,277	\$26,684
Fees paid by patients, in all clinical departments	7,357	7,001	11,677	10,320
Gifts	1,200	1,200	1,200	1,200
Miscellaneous receipts	499	254	402	194
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	None	None
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	7,000	7,000	7,500	8,450
Total amount of current income	\$49,610	\$39,372	\$39,056	\$46,848
<i>Total amount of current expenditures</i>	\$43,255	\$35,444	\$40,319	\$39,446
Surplus for the year	6,355	3,928	...	7,402
Deficit for the year	...	...	1,263	...
Surplus paid to the University; added to the endowment fund for the Dental Department ²	8,699 ³	3,928	None	None
Amount expended for the School by the University, in excess of dental income, and included in "University Funds," above	None	3,072	7,500	1,048
Average amount expended by the School per student (D.D.S.) per year	302	253	384	331
Average amount of all student fees paid to the School per student (D.D.S.) per year	235	171	174	224
<i>Details of expenditures:</i> ⁴				
For reduction in principal of debt	3,060	None	None	None
For interest on debt	None	None	None	None
For repairs	1,000	800	1,600	700
For new equipment	2,318	612	1,035	661

¹ During the academic years 1920-24, there was no appropriation by Congress or the City, and no income from endowment; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² This endowment fund now amounts to \$41,962 (September 1, 1925). As it becomes due, the interest on the fund is added to the principal sum.

³ In 1920-21, the payment of surplus to the University included all of the net income for 1920-21, and \$2344 of that for 1919-20 (the total of which was \$11,655).

⁴ During the academic years 1920-24, there were no payments on account of rent, new construction, or land.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
For research	None	None	None	None
For improvement of the library	\$150	None	\$140	\$50
For supplies used in the clinical departments	3,217	\$2,300	3,788	4,010
For salaries : for administration	1,946	2,726	2,726	3,325
For salaries : for teaching	14,406	16,444	18,444	21,427
For all other purposes	17,158	12,562	12,586	9,273
<i>Salaries for instruction :</i>				
(Number of teachers of dental subjects)	(30)	(29)	(40)	(40)
Amount of their salaries or honoraria as teachers	7,406	9,444	10,944	12,977
Number of teachers of dental subjects who did not receive salaries ¹	(26)	(25)	(35)	(34)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	1,500	2,000	2,000	2,000
Smallest salary paid to a whole-time teacher of a dental subject	1,500	2,000	2,000	2,000
(Number of teachers of academic or medico-dental subjects)	(12)	(14)	(15)	(16)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	7,000	7,000	7,500	8,450
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
To dental students	3,000	3,000	3,000	3,000
To medical students	3,000	3,000	3,000	3,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,500	1,500	1,500	1,500
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid from the medical budget (the "allotment" referred to above)	7,000	7,000	7,500	8,450
Salary value of the teaching by Jesuits without expense to the School (included in "Gifts" and "Total expenditures," above)	1,200	1,200	1,200	1,200

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 56. Of this total number, 6 were whole-time, none half-time, and 10 part-time or occasional teachers of academic or medico-dental subjects; 2 were whole-time, none half-time, and 38 were part-time or occasional teachers of dental subjects; 2 were whole-time teachers in the Dental School only; 13 were "full" professors; 10 were associate, assistant, or clinical professors; 6 were lecturers by title; 44 received no salaries;² 6 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Summer courses in clinical dentistry (June and September): since 1908; attendance: 1922—18; 1923—28; 1924—20; 1925—22

No combined curricula leading to the degrees of B.S. or B.A., and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists

¹ The total amounts paid to the part-time teachers as honoraria, during the academic years 1920-24, inclusive, were \$4076, \$6114, \$7614, and \$9620, respectively.

² All received honoraria. See footnote 1.

STUDENTS AND GRADUATES, SCHOOL OF DENTISTRY, GEORGETOWN UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance	92	113	162	140	117	128
Women.....	0	0	0	0	0	0
From other countries; chiefly from Porto Rico, Panama, and Japan	4	5	3	6	4	0
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	87	113	143	140	105	119
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	0	6	7	1	3	0
From other countries, to advanced standing.....	0	0	6	1	1	0
"Repeaters" of one or more subjects.....	0	0	0	6	3	2
Denied further instruction because of deficient scholarship.....	0	0	0	0	1	0
GRADUATES (D.D.S.)						
Total number of graduates.....	28	11	14	17	25	28
Women.....	0	0	0	0	0	0
Admitted to practice in other countries.....	1	0	0	0	1	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	3	4	4	2	9	8
Percentages of failures in such state-board examinations	25.0	55.6	18.2	0	0	16.0

(nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: actively in progress in 1924-25, on the sterilization of infected root canals; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: December, 1921; June, 1924

The foregoing data have been verified in detail by the Assistant Dean or Regent

SUMMARY

UNTIL 1922-23 this School was a department of the Medical School, but dentistry has not been taught as a specialty of the practice of medicine. The Announcement of the Medical School does not list any aspect of oral health-service among the subjects of formal instruction for medical students (1925-26), although such specialties as ophthalmology and otolaryngology are taught in detail to undergraduates. In the description of the course in hygiene and dietetics for medical students, which is conducted by the Dean of the Medical School and presents many details, teeth and mouth are omitted from this sequence of particulars: "Personal hygiene, care of the skin, eyes, ears, nose, throat, bowels, baths, and clothing . . . physical defects and the prevention of permanent disabilities in childhood." There are no dentists in the Medical Faculty and none on the staff of the University Hospital. The Medical and Dental Schools are closely associated in the building they occupy jointly, but they do not cooperate in the clinical phases of their work. The library is inferior and dental research has been almost wholly neglected. The Dental Faculty has confined its attention to the undergraduate curriculum. In 1924-25, as an indication of the quality as well as the degree of attention the instruction has been receiving, only \$12,955 was paid in salaries and honoraria to 40 teachers of dental subjects, and of the 56 teachers in that year only 2 gave whole-time service in the Dental School. Of the total number of teachers, 23 were "professors," although only 6 had taken courses in an academic college.

In the same year, the University accepted a surplus of \$4150 as an addition to an "endowment fund for the Dental Department," the interest on which as it becomes due is added to the principal sum. Conditions in previous years were similar. If funds sufficient to support a dental school befitting the dignity of the University and the importance of Washington cannot be obtained, the University would be well advised to discontinue the School.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT GEORGETOWN UNIVERSITY: 1924-25

States (18) and territories (3)	First year	Second year	Third year	Fourth year	Total
Connecticut	13	2	4	1	20
District of Columbia	12	17	5	7	41
Massachusetts	0	1	1	4	6
New Jersey	21	7	4	0	32
New York	12	6	1	1	20
Ohio	1	2	0	1	4
Pennsylvania	14	3	0	4	21
Arizona, California, Maine, Maryland, Minnesota, Missouri, Philippine Islands, South Carolina, Utah — one each	5	1	1	2	9
North Carolina, Porto Rico, Rhode Island, Vir- ginia, West Virginia — two or three each	9	1	2	0	12
Total	87	40	18	20	165

A new building for the Medical and Dental Schools, in close association with the University Hospital, is clearly an essential for future usefulness and growth.

The effect of requiring a year of approved work in an accredited academic college for admission, beginning in 1925-26, is shown on page 308 by the figures for attendance. Data for the geographical distribution of the students, in 1924-25, are given in the accompanying table, where it may be seen that most of the non-resident students came from Connecticut, New Jersey, New York, and Pennsylvania. Comparative data relating to students, graduates, and results of license examinations, are tabulated on pages 308-309.

(2) DENTAL COLLEGE, SCHOOL OF MEDICINE, HOWARD UNIVERSITY

Location: W Street, N.W., between Fifth and Sixth Streets; one and one-half miles from the centre of the city

General character: integral part of Howard University

Organized: in 1884; the original dental school for colored students. Special courses in dentistry were given by the School of Medicine, to medical students, from 1881 to 1884, inclusive

Buildings: two. The building of the School of Medicine (used by the Medical, Dental, and Pharmaceutical Colleges) was erected in 1869; special improvements affecting the work of the Dental College were made in 1894; floor area used, in the medical building, for the instruction of dental students, 19,801 sq. ft. A smaller adjacent building, erected in 1867, is used exclusively by the Dental College, and contains the Infirmary and facilities for instruction in dental technology; special improvements were made in 1922; floor area, 13,915 sq. ft. Total floor area in both buildings used for the instruction of dental students: 33,716 sq. ft. Distance from the main site of the University, one block

Infirmary: in the dental building, with four accessory rooms; total floor area, 8090 sq. ft. Total number of chairs in active use, 70, including groups reserved for special purposes: prosthodontia, 6; extraction, 3; examination, 1

Relation of the School of Medicine (Class A): intimate; the medico-dental subjects are taught to medical and dental students separately in identical laboratories by the same

instructors. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: Freedmen's Hospital (one block)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for all aspects of oral medicine

Number of dental internships or externships, held by officers or students of the School, in the Hospital in 1924-25: none

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: clinics in oral surgery; to teach oral surgery under the conditions that prevail in a good hospital

Library (primarily medical): room, 200 sq. ft.; whole-time librarian. Contains 2000 bound and 100 unbound volumes, and 1000 pamphlets (all effectively card indexed). Of the volumes, approximately 100 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: University Library (two blocks); Library of the Surgeon-General's Office (one and one-half miles)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean of the School of Medicine: whole-time officer for the School of Medicine, part-time officer for the Dental College; also Professor of the Principles and Practice of Surgery and Clinical Surgery, in both the School of Medicine and the Dental College. *Vice-Dean of the Dental College*: whole-time officer; also Professor of Operative Dentistry and Operative Technic

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: uncertain

Number of graduates (1885-1925): 674; average per year, for forty-one years, 16

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 175; proportion from the District of Columbia: 1922-23 — 10 per cent; 1923-24 — 6 per cent; 1924-25 — 11 per cent. (The number admissible to any of the four classes, because of lack of facilities, is now limited to 50)

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21 — 881; 1921-22 — 1551; 1922-23 — 2525; 1923-24 — 2693; 1924-25 — 1576

Number of visits, sittings, or operations: 1920-25 — no available data

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-25 — no available data

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value of land and buildings, \$20,000, and equipment used directly for dental education, \$20,000; total, \$40,000 (June 30, 1925). The estimated total value of the buildings of the entire Medical College is \$78,000

General debt on the School, or carried by the University on the School's account (June 30, 1925): none

DISTRICT OF COLUMBIA

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	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$30,190	\$34,450	\$31,400	\$22,210
Fees paid by patients, in all clinical departments	2,823	3,262	7,655	6,610
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	None	None
(b) Estimated amount of miscellaneous income available to the College as an integral part of the University, but not specified in the dental budget	8,695	5,789	4,528	15,379
Total amount of current income	\$41,708	\$43,501	\$43,583	\$44,199
<i>Total amount of current expenditures</i>				
Surplus for the year	4,260	...	...	...
Deficit for the year	...	2,327	22,405	14,865
Amount expended for the College by the University, in excess of dental income, and included in "University funds," above	4,435	8,126	7,080	8,480
Average amount expended by the College per student (D.D.S.) per year	143	193	335	441
Average amount of all student fees paid to the College per student (D.D.S.) per year	116	148	159	158
<i>Details of expenditures:</i> ²				
For repairs	800	1,200	2,000	1,561
For new equipment				
For new construction (no land)	None	None	3,360	None
For research	None	None	None	None
For improvement of the library	50	50	50	125
For supplies used in the clinical departments	2,276	3,042	8,533 ³	6,676 ³
For salaries: for administration	1,800	2,200	4,200	5,617
For salaries: for teaching	28,344	38,259	47,845	44,785
For all other purposes	4,178	1,077	None	300
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(10)	(15)	(20)	(17)
Amount of their salaries as teachers	11,844	19,459	26,495	19,435
Number of teachers of dental subjects who did not receive salaries	(None)	(3)	(5)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	3,000	3,000	3,000	3,000
Smallest salary paid to a whole-time teacher of a dental subject	2,400	2,400	2,400	2,400
(Number of teachers of academic or medico-dental subjects)	(7)	(10)	(12)	(18)
Amount of their salaries as teachers (paid from the general budget for all of the Departments of the School of Medicine)	16,500	18,800	21,350	25,350

¹ During the academic years 1920-24, there was no appropriation by Congress directly or by the City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

² During the academic years 1920-24, there was no payment on account of debt or rent.

³ The cost of the supplies exceeded the charges for the clinical service.

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on June 30				
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
To dental students	\$2,800	\$2,800	\$2,800	\$3,500
To medical students	2,800	2,800	2,800	3,500
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	2,000	2,000	1,500	1,500
Estimated proportionate share (for the Dental College) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the general budget for all of the Departments of the School of Medicine	5,500	5,789	4,528	9,762

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 29. Of this total number, 6 were whole-time, 5 half-time, and 5 part-time or occasional teachers of academic or medico-dental subjects; 5 were whole-time, 5 half-time, and 3 part-time or occasional teachers of dental subjects; 4 were whole-time teachers in the Dental College only; 3 were "full" professors; 1 was an associate professor; 1 was a lecturer by title; all received salaries; 3 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year. No combined curricula leading to the degrees of B.S. or B.A., and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists

STUDENTS AND GRADUATES: DENTAL COLLEGE, SCHOOL OF MEDICINE, HOWARD UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS: ALL COLORED (D.D.S.)						
Maximum attendance.....	130	220	263	235	207	145
Women.....	4	5	5	4	3	3
From other countries; chiefly from British West Indies.....	18	23	21	17	11	9
Attendance at the end of the year.....	130	220	261	232	197	134
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	0	0	0	5	0	1
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	1	2	0	10	5	5
Denied further instruction because of deficient scholarship.....	3	0	0	4	3	3
GRADUATES: ALL COLORED (D.D.S.)						
Total number of graduates.....	1 ¹	36	26	32	87	40
Women.....	0	1	2	1	1	1
Admitted to practice in other countries.....	5	3	0	2	4	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	0	9	5	6	9	8
Percentages of failures in such state-board examinations.....	...	55.6	42.9	30.0	12.5	24.0

(nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research: actively in progress in 1924-25, on the development of an anterior bolus balance; no publication in 1924 or 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: a list of such communities is brought frequently to the attention of students and graduates

¹ In 1916-17 the curriculum was lengthened to four years. The graduate in 1919 was a student who repeated the work of the senior year of the three-year curriculum.

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: December, 1921; June, 1924

The foregoing data have been verified in detail by the Dean

SUMMARY

THIS School, which is an integral part of the University and closely associated with the Medical College and the Freedmen's Hospital, has an exceptional opportunity to serve the Negro group. It would do so effectually if the disabilities under which it is proceeding, which are mentioned in Chapter V, were more generally understood and if an awakened public conscience would provide generous financial support (page 92). Among the urgent needs of the colleges in the Medical School at Howard, to improve the education of Negroes for health service among the colored population, are a large endowment for general maintenance, increased salaries for teachers of special ability and national repute, a new building adequate in size and modern in equipment, and ample loan funds for the assistance of worthy students. Notwithstanding the devotion and self-sacrifice of the officers of administration and instruction, who have been giving their best to a great cause, the School cannot be maintained successfully while present infirmities continue.¹

One who has noted the facts relating to the general deficiency of dental service for the Negro group (Chapter V), who realizes the significance of these conditions for both the

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT HOWARD UNIVERSITY: 1924-25

<i>States (24), territory (1), and foreign countries (4)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
District of Columbia	1	3	4	3	11
Florida	0	0	0	3	3
Massachusetts	0	2	1	0	3
Missouri	0	2	0	1	3
New Jersey	2	2	3	3	10
New York	3	4	0	0	7
North Carolina	0	1	3	4	8
Pennsylvania	1	3	2	1	7
Texas	1	1	2	0	4
Virginia	1	3	7	4	15
West Africa	1	0	1	1	3
Connecticut, Delaware, Dominican Republic, Illinois, Kansas, Maryland, Nebraska, Ohio, West Virginia— one each	2	3	1	3	9
Alabama, California, Canada, Georgia, Kentucky, Michigan, Rhode Island, South America, South Carolina— two each	1	4	3	10	18
Total	13	28	27	33	101

¹ During the years 1918-26, the National Government has annually provided, for the support of Howard University, sums ranging between \$117,938 (1918-19) and \$691,000 (1925-26)—a total in eight years of \$2,141,376. (The total enrolment of students at present—1925-26—is 2155). Of the funds granted by Congress during the past eight years, \$116,000 was appropriated in 1921-22, and \$370,000 more in 1925-26, for a new medical building; and \$7000 to \$9000 annually for the current expenses of the School of Medicine. The endowment fund of the School of Medicine is \$183,000 (June 30, 1925); the deficit for 1924-25 was \$4791. Several years ago the General Education Board announced a gift to the University of a total of \$250,000 for the endowment fund of the School of Medicine, to be paid in full when the University obtains \$250,000 additional from other sources for the same purpose. Thus far the public has given only \$84,446 of this supplementary amount (June 30, 1925), but an equal portion of the General Education Board's conditional gift has been paid to the University. The Dental College as one of the units constituting the School of Medicine, will receive, if only indirectly, some of the benefits accruing from these funds; but, like the Dental School at Meharry, it needs a large general endowment and special gifts for its maintenance and development in accord with its obligations and its opportunity.

white and colored portions of the population, and who understands that the doors of most dental schools have been closed to Negroes, may find plenty of food for further reflection in the comparative data on page 308 for the recent attendance at the older of the two existing dental schools for colored students.¹ The situation at Meharry, the younger of the two, is similar to that at Howard (page 92). The geographical distribution of the students, in 1924-25, is indicated in the table on page 297. Comparative data relating to students, graduates, and results of license examinations, are tabulated on pages 308-309.

In the Medical College at Howard, as in most medical schools in North America, the students receive no formal instruction in any aspect of odontology, stomatology, or clinical dentistry, but are given required courses in other specialties. There are no dentists in the Medical Faculty and none on the staff of the Freedmen's Hospital.

(3) ARMY DENTAL SCHOOL, ARMY MEDICAL CENTER

Location: on the grounds of the Army Medical Center, the central unit in the school system of the Medical Department of the Army, which was established on September 1, 1923, in the Tacoma Park section of the District of Columbia, on the reservation bounded by 16th Street, Alaska Avenue, Fern Street, Georgia Avenue, and Aspen Street extended (site of the Battle of Fort Stevens during the Civil War); distance from the centre of the city, five miles (north)

General character: an integral part of the Army Medical Center, the other units of which are the Walter Reed General Hospital, the Army Medical School, the Army Veterinary School, and the Army School of Nursing. The Medical, Dental, and Veterinary Schools are primarily graduate schools, where officers are more fully prepared for their professional duties in the military service. In 1926, the formal graduation exercises for these three graduate schools were held on February 10, when addresses were delivered by the Surgeon General and the Chief of Staff of the Army, and diplomas were presented by the Chief of Staff. The School of Nursing is an undergraduate school. Courses for physiotherapy aides, for occupational therapy aides, and for hospital dietitians are maintained at the Walter Reed General Hospital. In addition to its direct educational work, the Army Medical Center conducts extensive clinical and experimental studies, and prepares large amounts of biological products for the Army, Navy, and other Government departments

Organized: in 1921; established for the advanced instruction of dental officers of the Regular Army, of the Reserve Corps, and of the National Guard. Since 1924-25, the School has also been training certain enlisted men of the Medical Department of the Army as dental hygienists, and dental mechanics

Buildings (two). (1) The Dental School headquarters and the library are housed in a two-story semi-permanent building near the Medical School. It was erected during the World War as a ward in the Hospital, and is occupied jointly by the Dental and Veterinary Schools. It contains a lecture room and prosthetic laboratory, where instruction is given in the courses for enlisted men; also a museum having many very valuable photographic and plastic exhibits of war-time maxillo-facial cases. Total floor area used by the Dental School, 3800 sq. ft. (2) All instruction of officers is conducted in the laboratories and lecture rooms of the Army Medical School, except practical clinical instruction and prosthetic laboratory instruction, which are conducted in the Clinic of the Walter Reed

¹New York City now contains the largest and most expansive urban Negro centre in the United States. Howard and Meharry will hardly be able to enforce the New York requirement of two years of approved work in an accredited academic college followed by a four-year professional curriculum after January 1, 1927, without impairing their usefulness to the rest of the country, but these schools could adopt the two-three-graduate plan, including lengthened professional years if necessary, without adding another calendar year to the present time requirements in the training of general practitioners. Lengthened professional years would favor more intensive, continuous, and effectual training in mechanical procedures, in which, the results of license examinations indicate, Negro graduates in dentistry are often very deficient.

General Hospital (see "Infirmiry," below). The building of the Medical School, which is a modern, brick structure, having four stories and a basement, was erected in 1922 at a cost of \$500,000. Plans adopted for the extension of the Medical Center include the construction of a wing on this building for the Dental School

Infirmiry: in the Clinic of the Walter Reed General Hospital, with six accessory rooms for clinical work; total floor area, 4250 sq. ft. Total number of chairs in active use, 16, including groups reserved for special purposes: prosthesis, 4; oral prophylaxis (hygienists), and oral surgery, 2, each; examination, 1

Relation of the School of Medicine: intimate; in the medico-dental subjects and in clinical pathology, the students in the Medical and Dental Schools are taught together by members of the Faculty of the Medical School, some of whom are officers of the Dental Corps of the Army. This arrangement opens the best facilities to each group of students. Officers of the Dental School attend the monthly Center conferences, through which the resources of the Schools and Hospital are coordinated in a strong professional service for the entire Center

Hospital in which student dental officers received accredited instruction, or performed stated clinical service, in 1925-26: Walter Reed General Hospital, near the dental building; maintained for the treatment of the sick and wounded of the Army, and of discharged disabled soldiers, particularly those of the World War who, requiring further treatment as beneficiaries of the Veterans Bureau, are entitled to it. In 1924, a total of 5911 patients with 22,487 sittings represented the work of the dental service of the Hospital, in which most of the members of the Dental Faculty are dental officers

Clinical facilities in the Hospital where student dental officers received accredited instruction in 1925-26: excellent; similar to those of a typical large general hospital; 1500 beds, of which approximately 1100 are constantly occupied

Number of dental internships or externships, held by teachers or students of the Dental School, in the Hospital in 1925-26: none; nearly all of the dental officers who are members of the Faculty of the School are also members of the Staff of the Walter Reed General Hospital

Nature and specific purposes of the accredited clinical instruction given in the Hospital in 1925-26: to teach oral health-service under the conditions that prevail in a good military hospital. The student officers receive advanced practical instruction in clinical dentistry, prosthesis, roentgenology, and oral surgery, with particular attention to the treatment of maxillo-facial injuries

Library: in the dental building; contains about 500 bound volumes and 150 pamphlets

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Library of the Medical School, containing 4000 volumes. Also the Surgeon General's Library, the largest and most complete medical library in the world, containing 814,796 volumes and pamphlets (seven miles)

Chief administrative officers: Commanding Officer of the Army Medical Center, with the rank of Brigadier General; Commandant of the Army Dental School, with the rank of Colonel, Lieutenant-Colonel, or Major

Minimum academic, professional, and military requirements for admission: the basic *graduate curriculum* is open to officers of the Dental Corps of the Regular Army, who are appointed from applicant graduates of dental schools above the grade of Class C; who have engaged for at least two years in the legal practice of dentistry subsequent to graduation; and who, having been found physically and morally fit, pass rigorous examinations testing their general education and professional proficiency. Of seventy-three applicants in April, 1925, only thirty-two completed the examinations and only four were able to qualify for admission to the Corps. The basic graduate curriculum is also open to

any commissioned officer in the Dental Reserve Corps or the Dental Corps, National Guard. To be eligible to such commission, the dentist must be a graduate of a dental school above the grade of Class C and must possess a license to practise dentistry.

An enlisted man, to be selected for the course for *dental hygienists, or for dental mechanics*, must meet the following minimum requirements: he must have at least one year to serve in current enlistment after the expiration of the course; be of excellent character and in good physical condition; possess a good elementary education as shown by reasonable proficiency in penmanship, orthography, and English; be fully qualified in the basic military duties of the soldier; be rated or qualified for the rating of apprentice dental mechanic or apprentice dental hygienist; and be recommended as capable by the senior dental officer under whom he is serving.

Number of graduates: basic graduate curriculum (1921-26), 56; average per year, for five years, 11. See summary of "Graduates," below.

Number of patients treated in the Infirmary by student dental officers: 1921-22—1227; 1922-23—799; 1923-24—789; 1924-25—849; 1925-26—740; average per year, for five years, 880. Data relating to sittings and operations are given on page 302.

Rating by the Dental Educational Council: none. The School, as a branch of the general military service, is under the direct control of the Nation's representatives. The Council cooperated with the Army, in an advisory capacity, when invited to do so (page 106).

FINANCIAL DATA

Estimated value of the property of the Medical Center: *land* (110 acres), \$3,000,000; *buildings, and equipment*: accurate estimates cannot be given because a part of the Hospital is still housed in semi-permanent buildings that were erected during the expansion process incident to the World War. Congress has appropriated \$2,000,000, and the Veterans Bureau has allotted \$1,000,000, for new buildings at the Hospital. Operations are about to be begun to replace these semi-permanent buildings with modern permanent ones at a total cost of \$3,000,000. The new Medical School building, used by the Dental School also, was erected at a cost of \$500,000. As the laboratories and lecture rooms of the Medical School and of the Clinic of the Walter Reed General Hospital are used freely for the instruction of student dental officers, the property of the Dental School cannot be valued separately.

Budget: included within that of the Army Medical Center; adequate for the School's immediate needs.

Tuition and service fees: none; all students and patients are drawn from the army personnel, and receive tuition and service free.

Salaries for instruction: none; all of the teachers in the Dental School are salaried officers of the Dental Corps, the Medical Corps, or the Medical Reserve Corps, and serve the School by special assignment.

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers in the Dental School in 1925-26: total, 24. Of this total number, 13 were teachers of academic or medico-dental subjects and 11 were teachers of dental subjects. The only titles used by teachers are those of the military service.

Curricula. (1) *For graduate students*: (a) a curriculum of basic courses extending through a period of five months (September to February). The schedule of instruction for the basic curriculum (September 10, 1925, to February 9, 1926) and the hours devoted to each subject are indicated in the accompanying table. After passing these basic courses, the graduates attend, from February to June, one of the annual courses of instruction for

BASIC CURRICULUM FOR STUDENT DENTAL OFFICERS: U. S. ARMY DENTAL SCHOOL: 1925-26

Subject	Lectures and Examinations Hours	Laboratory and Clinic Hours	Lectures and Laboratory Hours	Total Hours
Clinical dentistry	12	24	..	36
Oral surgery	42	21	..	63
Preventive medicine and clinical pathology	..	..	300	300
Prosthesis	32	210	..	242
Roentgenology	10	21	27	58
Special lectures	11	..	..	11
Total	107	276	327	710

commissioned personnel of the Army at the Medical Field Service School, Carlisle Barracks, Pennsylvania, where, through instruction that is regarded as essential for dental officers, they are further prepared to function efficiently in the field as dental officers, or in administrative duties, or as auxiliary medical officers, in an emergency. Also, (b) advanced curricula, extending through periods of five months (January to June), in preventive dentistry, also for various types of oral specialization, and for the promotion of research. (2) *For dental hygienists, and dental mechanics*: curricula extending from January to June. The subjects in these curricula and the hours devoted to each subject are indicated in the accompanying tables

CURRICULUM FOR DENTAL HYGIENISTS: JANUARY 2, 1926, TO APRIL 30, 1926

Subject	Hours
Anatomy, physiology, and histology	71
Clinical microscopy and bacteriology	198
Materia medica and therapeutics	6
Oral bacteriology and pathology	36
Oral clinical pathology	21
Technique and clinical instruction	256
	588

CURRICULUM FOR DENTAL MECHANICS: JANUARY 2, 1926, TO JUNE 30, 1926

Subject	Hours
Anatomy, physiology, and histology	71
Laboratory prosthesis and technique:	
Lectures and demonstrations	75
Laboratory exercises	457
Laboratory technique and clinical instruction	284
	887

No curricula or courses in any relation for other than Army personnel

Diploma: certificates of successful completion of curricula are bestowed, but degrees are not awarded

Research: actively in progress in 1925-26, on the bacteriology and prevention of dental caries, and on the histo-pathology of periodontoclasia. An officer of the Dental Corps is detailed for whole-time research and teaching in bacteriology in the Dental School.

GRADUATES:¹ ARMY DENTAL SCHOOL, ARMY MEDICAL CENTER

	1921-22	1922-23	1923-24	1924-25	1925-26	Total
Graduate students:						
(a) Basic curriculum	18	13	11	7	7	56
(b) Medical field-service course ²	20	13	10	6	8	57
(c) Advanced courses	..	..	..	..	5	5
Dental hygienists	..	..	..	2	4	6
Dental mechanics	..	..	..	6	5	11

¹ Thus far there have been no colored applicants for admission to the School.

² Given by the Medical Field-Service School, Carlisle Barracks, Pennsylvania.

The research laboratory in dental bacteriology is closely affiliated with the Department of Laboratories in the Army Medical School. An officer of the Dental Corps is also detailed for whole-time research and teaching in pathology in the Dental School. He occupies a well-equipped laboratory in the Army Medical Museum (seven miles), where there is an excellent organization for work in general pathology; several publications in 1924 and 1925

Visited: January, 1924; January, 1926

The foregoing data have been verified in detail by the Chief of the Dental Division, Surgeon General's Office, U. S. Army

SUMMARY¹

THIS School represents the development of a keen appreciation of dentistry as a division of health service, and of the need for a close correlation of clinical dentistry with clinical medicine in the maintenance of the health of the Army. The importance of this task may be inferred from the figures for the mean annual strength of the Army, which, for the calendar year ending December 31, 1924, excluding nurses, was 135,640. The strength in officers was 11,219; white enlisted men, 110,862; colored enlisted men, 4186; Filipinos, 7056; and Porto Ricans, 2317. The total strength in the United States was 99,157; Philippine Islands, 11,821; Hawaii, 12,493; Panama, 8561; China, 919; Porto Rico, 1308; and traveling on transports, 1381. For the performance of the health service for the whole Army there were the following commissioned personnel (June 30, 1925): Medical Corps, 924; Dental Corps, 153;² Veterinary Corps, 122; and Medical Administrative Corps, 71. The Army Nurse Corps numbered 725; there were 6465 enlisted men in the Medical Department; and 1606 civilians were employed in hospital service, and in depot and administrative service. On June 30, 1925, the number of vacancies in the Dental Corps was only 5; in the Medical Corps, 59.

The degree to which dental maladies affect the Army, the scope of the obligations of the Dental Corps, and the importance of the very best oral health-service for the entire personnel, on a peace basis, are indicated by the accompanying official data for dental service during the calendar year 1924, when dental defects among the officers and warrant officers were

DENTAL SERVICE RENDERED IN THE UNITED STATES ARMY DURING THE CALENDAR YEAR 1924³

	<i>Officers and men</i>	<i>Others</i>	<i>Total</i>
Number of persons treated	112,507	22,692	135,199
Number of sittings	218,893	44,215	263,108
Permanent fillings	78,643	9,804	88,447
Temporary fillings	14,021	3,103	17,124
Root-canal fillings	5,407	526	5,933
Crowns	1,059	98	1,157
Bridges	386	17	403
Dentures	1,822	124	1,946
Extractions	36,108	7,342	43,450
Calculus removed	20,308	2,246	22,554
Crowns repaired	208	39	247
Bridges repaired	437	54	491
Dentures repaired	709	96	805

¹ Statistical data and other information in this summary have been taken freely from the Annual Report of the Surgeon General for 1925.

² The ratio of dentists to physicians is 1:6—unusually low.

³ The total number of admissions to general and departmental hospitals was 33,830; the average number in hospitals daily was 6262.

so numerous that the Dental Corps was "directed to make further efforts towards a better dental condition among these more permanent military personnel." The comparative data for 1924 and 1925, in this regard, are shown in the accompanying table, where the indicated improvement does not disguise the continuance of widespread dental deficiency. The extensive occurrence of dental disorders among groups of men who are presumably among the healthiest reflects in a striking way the prevalence of oral ailments among the general population, and emphasizes the importance everywhere of a greater understanding and of a more effectual application of the principles of oral hygiene (page 308).

The Surgeon General in his report for 1925, summarizing the dental needs of the Army, stated that the allowances of commissioned personnel for both the Medical Corps and the

DATA ON THE NEED OF THE ARMY OFFICER PERSONNEL FOR ORAL HEALTH-SERVICE: 1924 AND 1925

<i>General conditions of the treatment</i>	1924	1925
	<i>Per cent</i>	<i>Per cent</i>
Number requiring <i>immediate</i> treatment	12	8
Number requiring <i>early</i> treatment	30	24
Number requiring <i>extended</i> treatment	14	10
Number requiring <i>no</i> treatment	44	58

Dental Corps are inadequate. Practically all corps areas and department surgeons emphasize this fact in their annual reports. In order to give dental service to smaller stations it has been necessary to order dental officers to them for periods of temporary duty. Although unsatisfactory, this is the most effective method with a dental staff as disproportionate as the existing one. While constant efforts are being made to relieve the situation through increased effort in the dental service, and by the more liberal use of technically trained enlisted men, the need for oral health-service is so great that it cannot be satisfactorily met without the authorization of a substantial increase in the number of dental officers, and of enlisted men assigned to the dental service. At present there are only 153 dental officers, a ratio of approximately 1 to 886 persons in the Army, and of 1 to 6 medical officers (December 31, 1924). It would seem to be obvious that in times of peace the real needs of the health service for the Army should not be subordinated to any other consideration.

The Army Dental School improves the training of able and experienced dentists who have been admitted to the Dental Corps of the Regular Army. The basic curriculum for dental officers is designed especially to improve their understanding of the means for the prevention of dental maladies and to promote the correlation of clinical dentistry and clinical medicine in the performance of their duties; to make the Dental Corps highly competent in peace or in war; to coordinate dental practice with that of all of the related Army units in preventive or curative medicine; and at all times to give to the entire Army personnel the highest attainable degree of oral health-service. The cooperation of medical and dental officers for the removal of all foci of infection that are suspected of adversely affecting the health of the patient is a routine condition in the Army Hospitals. Dental research receives special attention, has been supported effectually, and promises to continue to promote the general advance of dentistry. In accordance with the policy to give the Army the best available service, officers of the Dental School and of the Dental Corps in general are encouraged to associate themselves with leaders of the dental profession in civil life, to attend clinics and meetings of dental societies, and to visit dental schools in order to keep abreast of the latest developments in the profession.

On June 30, 1925, there were 8947 medical officers and 3666 dental officers in the Reserve Corps. On the same date there were 24 medical units and 8 dental units in the Reserve Officers Training Corps. The dental units were located in the dental schools at Creighton, Iowa, Minnesota, North Pacific, Northwestern, Ohio State, Pennsylvania, and St. Louis.¹ The number of dental students enrolled in these eight units was 1365, of

¹ These units have been continued (1925-26).

which 265 attended the six-weeks summer training school at Carlisle Barracks, Pennsylvania, or at Fort Snelling, Minnesota, or at Camp Lewis, Washington. In 1925, of the graduates of these eight dental schools, and of the candidates for admission to the Reserve Officers Training Corps, 160 received commissions as first lieutenants in the Dental Corps Reserve.

(4) DENTAL DEPARTMENT, U. S. NAVAL MEDICAL SCHOOL

Location: on the grounds of the reservation of the United States Naval Hospital, Twenty-third and B Streets, N.W.; distance from the centre of the city, one mile

General character: an integral part of the Naval Medical School. Besides (a) giving instruction to dental officers and hospital corpsmen, the School provides (b) a working laboratory for the construction of special prosthetic appliances as a part of the dental service for the Navy personnel. This additional service, if found practicable, will be extended eventually to all ships and stations. The School also (c) performs dental service for the Naval Hospital at Washington, where it has been the custom in the Navy to transfer patients who, owing to serious results of accident, have required extensive dental treatment that could not be obtained in other naval hospitals. The work of the School, in caring for such cases, is an important feature of its activities

Organized: in 1923 (February); established for the advanced teaching of oral health-service to officers of the Dental Corps, and to train and equip men of the Hospital Corps as assistants to dental officers

Building: near the main building of the Medical School; somewhat below the level of the Hospital, on the river side; faces the Lincoln Memorial. Erected in 1918 and devoted to other purposes during the World War; recently adapted to the needs of the School; one story; total floor area (all used by the Dental School), 6125 sq. ft.

Infirmery: in the dental building, with four accessory rooms; total floor area, 2630 sq. ft. Total number of chairs in active use, 17, including groups reserved for special purposes: examination, 3; prosthesis, 2; extraction, 1. In the separate prophylactic clinic for technicians there are 5 chairs

Relation of the School of Medicine: intimate; in the medical sciences the student dental officers are given instruction with those of the Medical Corps by members of the Faculty of the Medical School. This arrangement closely coördinates the work of the two schools and gives both groups of student officers access to all of the facilities. Some of the members of the Dental Corps teach medical students

Hospital in which student dental officers received accredited instruction or performed stated clinical service, in 1925: United States Naval Hospital, near the dental building

Clinical facilities in the Hospital where student dental officers received accredited instruction in 1925: excellent; similar to those of a typical large general hospital; 422 beds—approximately 300 constantly occupied

Number of dental internships or externships, held by teachers or students of the School, in the Hospital in 1925: none; two of the dental officers who are members of the Dental Faculty are also members of the staff of the Hospital

Nature and specific purposes of the accredited clinical instruction given in the Hospital, in 1925: to teach oral health-service under the conditions that prevail in a good naval hospital

Library: in the dental building; total number of bound volumes, 350, unbound volumes, 150, and pamphlets, 50

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Library of the Medical School; also Library of the Surgeon General of the U. S. Army (three-fourths mile)

Chief administrative officers: Medical Officer in command of the Naval Medical School, with the rank of Captain; Dental Officer in charge of the Naval Dental School, with the rank of Lieutenant Commander

Minimum academic, professional, and naval requirements for admission. (1) The graduate curriculum is open only to officers of the Dental Corps who are appointed from applicant graduates of Class A dental schools (previous practice is not essential), and who, having been found physically and morally fit, pass rigorous examinations testing their general education and their professional proficiency. In 1925, of 32 applicants, 20 took all of the examinations, but only 8 were able to qualify for admission. (2) The courses for dental technicians are open only to hospital corpsmen who have recently entered the service, who have had both instruction at hospital-corps training schools and practical experience in the Medical Department of the Navy, and also are recommended by dental officers who have found them competent. Most of the students who are admitted to these courses have had special training as assistants to dental officers

Number of graduates, graduate curriculum (1923-25): total, 30; average per year, for three years, 10. (See summary of "Graduates," below)

Number of patients treated in the Infirmary by student dental officers: 1923-25; 1924-408; 1925-441. Data relating to operations and treatments are given on page 307

Number of patients treated in the Hospital by student dental officers: 1923-25— included in the item next preceding; not available separately

Rating by the Dental Educational Council: none. The School, as a branch of the general naval service, is under the direct control of the nation's representatives

FINANCIAL DATA

Estimated value of the property of the Naval Medical Center: land and buildings, \$1,725,136, equipment, \$423,761; total, \$2,148,897. Dental School: total, \$25,450 (January 1, 1926)

Budget: included in that of the Medical School; adequate for the Dental School's immediate needs

Tuition and service fees: none; all of the students and patients are drawn from the Navy personnel, and receive tuition or service free

Salaries for instruction: none; all of the teachers in the Dental School are salaried officers of the Medical Corps or of the Dental Corps of the Navy, and serve the School by special assignment

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers in the Dental School in 1925: total, 12. Of this total number, 6 were teachers of academic or medico-dental subjects, and 6 were teachers of dental subjects. The only titles used by the teachers are those of the naval service

Curricula. (1) For student dental officers: four months in length; two classes annually, February to May, and September to December, each inclusive. The accompanying table indicates details of the curriculum (1925). (2) For dental technicians (who serve as oral hygienists, operative assistants, and dental mechanics): four months in length; two classes annually, February to May, and September to December, each inclusive. The curriculum includes both didactic and laboratory or clinical instruction in anatomy, clerical duties, dental first aid, dental prosthesis, dental roentgenography, metallurgy, military drill, operative assistance, operative technic, oral prophylaxis, physiology, and a general review of the hospital-corps handbook

No curricula or courses in any relation for other than Navy personnel

CURRICULUM FOR STUDENT OFFICERS AT THE U. S. NAVY DENTAL SCHOOL: 1925

Subject	Lecture hours	Laboratory or Clinical hours	Total
Bacteriology	...	41	
Dental and oral diagnosis	16	...	
Dental prosthesis	16	164	
Dental radiology	12	4	
Medical department duties	34	...	
Minor oral surgery	16	36	
Operative dentistry	16	180	
Pathology	...	17	
Preventive dentistry	...	16	
Total	110	458	568

Diplomas: certificates of successful completion of curricula are bestowed, but degrees are not awarded

Research: actively in progress in 1925, on methods for the sterilization of root canals, and on the relation of dental foci of infection to systemic disease; several publications in 1924 and 1925

GRADUATES AND PRESENT ATTENDANCE: ¹ DENTAL DEPARTMENT, U. S. NAVAL MEDICAL SCHOOL

	Graduates (two classes in each year)			Present attendance
	1923	1924	1925	1926 ²
Graduate students	10	10	10	5
Dental technicians	20	20	20	10

Visited: January, 1926

The foregoing data have been verified in detail by the Officer in Charge

SUMMARY³

THE School was established in recognition of the value of dentistry in the conservation of health and also of the importance of giving to the Navy personnel the highest attainable degree of oral health-service. It is well organized and equipped for the number of students it admits. This School, like that of the Army (page 298), is needed for the special training of the officers of the Dental Corps and of hospital corpsmen as their technical assistants. Its functions include dental diagnosis and treatment for the naval hospital, naval dispensary, and other naval units where practicable, and also for the Veterans Bureau patients. The School makes prosthetic appliances for persons in the naval service. During the year ending June 30, 1925, a total of 438 such restorations were completed. In over 6000 sittings, 5463 were given to naval personnel and 623 to Veterans Bureau patients. The School is effectually coördinated with the Medical School and Hospital, receives the sympathetic encouragement and support of the Surgeon General, and, in its oral health-service for officers and men as well as in its research in general, makes important contributions to the national welfare. The general policies in the conduct of the School are analogous to those of the Army Dental School, but there are no supplementary graduate courses, although officers of the Naval Dental Corps are given opportunity to take graduate courses at leading universities.

¹ None of the students or graduates was a Negro.

² January 15 to May 1 (February, 1926).

³ The Annual Report of the Surgeon General of the U. S. Navy, for 1925, has been drawn upon freely for the facts in this summary.

The average daily strength of the Navy in 1924 was 119,280 officers and men, distributed among these classes:

Officers of the Navy and Marine Corps	9,212
Enlisted men, Navy	87,442
Enlisted men, Marine Corps	19,113
Midshipmen at the Naval Academy	2,100
Members of the Navy Nurse Corps	487
Prisoners	926
Total	119,280

During the year ending June 30, 1925, there were 159 members of the Naval Dental Corps, a ratio of approximately 1 dentist to every 730 officers and men in the service. It is generally conceded that a ratio of 1 dental officer to every 350 officers and men would not be disproportionate for the actual needs of the Navy. In a discussion of the reasons for an enlargement of the Dental Corps, the Surgeon General has stated that, with the growing realization that dental disease is a causative and aggravating factor in many other ailments, the demand for dental service has increased to such an extent that the Bureau of Medicine and Surgery is unable to supply a sufficient number of dental surgeons to provide satisfactory attention to the personnel of many ships and stations. The need for replacement of teeth in patients who may be treated under the present limited personnel and

DENTAL OPERATIONS AND TREATMENTS IN THE U. S. NAVY: CALENDAR YEAR 1924

<i>Operation or treatment</i>	<i>Number of cases</i>	<i>Operation or treatment</i>	<i>Number of cases</i>
Fillings:		Prosthetic restorations (continued):	
Amalgam	56,452	Inlays	142
Cement, oxyphosphate	13,282	Bridges repaired	32
Cement, silicate	17,184	Crowns repaired	92
Gutta percha, permanent	993	Dentures repaired	143
Extractions:		Miscellaneous:	
Impacted	1,385	Abscesses, drained through canals	3,884
Simple	22,703	Abscesses, lanced	2,769
Surgical removal (other than impactions)	1,330	Alveolectomies	269
Postoperative treatments	19,364	Apicoectomies	894
Anesthesia:		Calculus removed (sets)	18,547
Conduction	7,224	Fractures (mandible)	192
General	332	Fractures (maxilla)	29
Local	14,181	Gingivitis (cases)	6,689
Pulps extirpated:		Necrosis (cases)	127
Conduction anesthesia	727	Porcelain crowns	842
Devitalization	2,300	Pyorrhea (cases)	2,765
Infiltration anesthesia	613	Recemented bridges	850
Pressure anesthesia	2,525	Recemented crowns	888
Without anesthesia	997	Recemented inlays	735
Root canal fillings:		Restorations: plates	107
Inserted (teeth)	6,155	Roentgenograms (not recorded above)	27,481
Checked by roentgenograms	1,557	Treatments, root canal (teeth)	14,839
Prosthetic restorations:		Treatments, sedative	27,892
Bridges	170	Vincent's stomatitis (cases)	681
Crowns, gold	80	Other operations and treatments	25,151
Dentures	348	Total operations and treatments	305,872

facilities of the Dental Corps has assumed such proportions that at present this health service cannot be given adequately. In the Navy as in the Army, the means for oral health-service should obviously be extended, the requirements in each being similar. The character and extent of this service in the Navy, in 1924, are shown by the data in the table on page 307. The number and variety of the oral operations and treatments for men who as a group are among the healthiest in the nation is another impressive indication of the general prevalence of dental and oral maladies (page 303), and of the importance of oral hygiene and of dentistry.

GENERAL COMMENT

IN the surrounding states of Maryland and Virginia there are two dental schools. Pennsylvania contains three. The schools in these three states could readily meet the educational requirements of the District in oral health-service, a condition which emphasizes the suggestion on page 293 that there is no public need at Georgetown for a dental school that is not among the best. There is no present shortage of dentists in Washington, and in the future the District's special needs in oral health-service will probably be met as in the past by dentists from all parts of the country, who are attracted to the national capital by many influences. The two Washington schools are more important nationally than locally, for each receives most of its students

DATA PERTAINING TO THE TWO UNDERGRADUATE DENTAL SCHOOLS IN THE DISTRICT OF COLUMBIA: 1919-26

Total attendance

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Georgetown	113	143	140	101	117	147	128 ¹
Howard	220	261	232 ¹	203	133	90	98
Total	333	404	372	304	250	237	226

Percentage of students resident in the District

Georgetown	17	20	22	21	27	25	25
Howard	10	12	12 ¹	10	6	11	9

Number of graduates

Georgetown	11	14	17	25	28	13	23 ²
Howard	36	26	32	87	40	24 ¹	31 ²
Total	47	40	49	112	68	37	54

Classification of the total attendance

	First year	Second year	Third year	Fourth year	Total
Georgetown: 1922-23	24	17	29	31	101
1923-24	51	20	15	31	117
1924-25	70	40	18	19	147
1925-26	18 ¹	62	25	23	128
Howard: 1922-23	29	18 ¹	57	99	203
1923-24	25	29	21 ¹	58	133
1924-25	12	26	26	26 ¹	90
1925-26	25	15	27	31	98

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

² The number of seniors (December, 1925).

from territory outside of the District, to which they return (pages 293 and 297). At Georgetown the number of students from foreign countries has ranged, recently, between six in 1920-21 and none in 1925-26; at Howard, between twenty-three in 1919-20 and six in 1925-26. Most of the dental practitioners in Washington are graduates of schools other than those now existing in the District. A large number are graduates of the former Dental School (1888-1920) of George Washington University, which, in 1903, as the Dental Department of Columbian University (the former name of the University), absorbed the Dental Department of the National University (1884-1903), but was discontinued in 1920. The recent service of the two existing undergraduate schools to the District is indicated by the comparative data in the table on page 308.

The dental schools of the Army and Navy are conducted primarily as graduate institutions under the control of the medical branch of each service, where dentistry, regarded as an important means for the preservation of health, is promoted without prejudice as an essential agency for the maintenance of the vigor of the national defensive personnel. This position of the medical officers of the United States Army and Navy is obviously based primarily upon a clear sense of public obligation, and, being personally and professionally disinterested, merits the special attention of the medical and dental professions of North America.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of District of Columbia schools for civilians who failed, in the number of states indicated by the figures in parenthesis:

1925.—Georgetown, 9.1 (3); Howard, 57.1 (5); U. S. schools collectively, 11.3.

1910-25 (cumulative).—Georgetown, 20.1 (27); Howard, 29.9 (30); U. S. schools collectively, 14.2.

FLORIDA

Population: 1,079,637. Number of dentists, 501; physicians, 1452. Ratios: dentists to population, 1:2155; physicians to population, 1:744; dentists to physicians, 1:2.9

Statutory requirements. *Dentistry*.—Preliminary education: none. Professional training: graduation from a reputable dental school as defined by the National Association of Dental Examiners. *Medicine*.—Preliminary education: none. Professional training: graduation from a Class A medical school

Dental school: none; medical school: none

GEORGIA

Population: 3,043,493. Number of dentists, 864; physicians, 3122. Ratios: dentists to population, 1:3523; physicians to population, 1:975; dentists to physicians, 1:6.3

Statutory requirements. *Dentistry*.—Preliminary education: none. Professional training: graduation from a dental school having a curriculum equal to those of the majority of the dental schools in the United States. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from an approved medical school requiring attendance for four years aggregating at least 120 weeks

Location of the dental school: Atlanta; medical schools (2): Atlanta and Augusta

ATLANTA

Population: 230,083. Number of dentists, 273; physicians, 633. Ratios: dentists to population, 1:843; physicians to population, 1:363; dentists to physicians, 1:2.3
 Number of dental clinics or infirmaries, 4; hospitals, sanatoriums, and charitable institutions, 20; hospitals approved for internships, 5

Dental School: Atlanta-Southern Dental College. *Medical School*: Emory University

ATLANTA-SOUTHERN DENTAL COLLEGE

Special note. The corporation has recently begun the erection of a four-story concrete and brick building, at Courtland Street and Forrest Avenue (three-fourths of a mile from the centre of the city), which has been designed to accommodate about 500 students and to which it is expected the School will be removed on or about April 1, 1926. The estimated cost of the new building is \$220,000; its total floor area will be 40,400 sq. ft. The floor area of the Infirmary will be 8884 sq. ft.; the number of chairs, 139. A small two-story annex (3000 sq. ft.) will be used exclusively by the Department of Anatomy. The School will be re-chartered as a non-proprietary institution. See the Appendix

Location: 100 North Butler Street; one-fourth mile from the centre of the city

General character: independent and proprietary. Owned by a stock company whose members, since March, 1921, have limited the payment of dividends to a maximum of 8 per cent annual interest on their investment. See "Special note," above

Organized: in 1917, by union of the Southern Dental College (1887-1917) and the Atlanta Dental College (1892-1917). The Southern Dental College was organized, in 1887, as an affiliated dental department of the Southern Medical College. When the Southern Medical College and the Atlanta Medical College were combined, in 1898, to form the Atlanta College of Physicians and Surgeons, the Southern Dental College became its dental department (affiliated), and remained in that relation until 1914, when the Atlanta College of Physicians and Surgeons was discontinued and the Southern Dental College continued independently (1914-17). The Atlanta Dental College was established in 1892, to "stand alone for the teaching of dentistry apart from an institution teaching medicine or other allied sciences." The Atlanta-Southern Dental College has been without medical affiliations since its organization

Building (clinical): erected in 1893 for the Southern Dental College; special improvements were made (including a large annex) in 1917; now occupied by the School as a tenant; total floor area, 36,000 sq. ft. Some of the academic and medico-dental subjects are taught in rented rooms in a nearby building (one-half block); total floor area of the rented rooms, 4000 sq. ft. Total floor area now devoted to the work of the School, 40,000 sq. ft.

Infirmary: in the clinical building, with five accessory rooms; total floor area, 6175 sq. ft. Total number of chairs in active use, 90, including groups reserved for special purposes: extraction, 3; oral surgery and roentgenography, 1 each

School of Medicine: associated with none

Dispensary or Hospital in which dental students received accredited instruction, or performed stated clinical service, in 1920-25: none

Library (in the clinical building): room, 300-sq. ft.; no librarian. Contains 404 bound volumes; no unbound volumes or pamphlets (not card indexed). Of the volumes, approximately 380 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Carnegie Public Library (eight blocks), and the Library of the Fulton County Medical Society (twelve blocks)—not in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: part-time officer; also Professor of Oral Surgery. *Executive Dean*: whole-time officer; also Professor of Operative Dentistry. (The President of the College is President of the American Dental Association; 1925-26)

Minimum academic requirement for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (15 units), or its equivalent (since 1917)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

Number of graduates (1918-25): 618; average per year, for eight years, 77. (Number for the Southern Dental College, 1888-1917—903; average per year, for thirty years, 30. Number for the Atlanta Dental College, 1894-1917—1291; average per year, for twenty-four years, 54)

Average total attendance, per year (at the end of the year), for the past eight years (1918-25): 306; proportion from Georgia: 1922-23—23 per cent; 1923-24—24 per cent; 1924-25—25 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—2581; 1921-22—4077; 1922-23—7980; 1923-24—6614; 1924-25—9728

Number of visits: 1920-21—6484; 1921-22—10,079; 1922-23—25,098; 1923-24—19,671; 1924-25—27,813

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value of land and buildings (old), \$75,000, and equipment, \$75,000; total, \$150,000 (September 15, 1925). The School occupies the clinical building as a tenant (since June 30, 1923)

General debt on the School (September 15, 1925): \$30,000 (incurred by the recent purchase of land for a new building)

Par value of outstanding shares (480) of stock (June 30, 1925): \$48,000. See "Special note," above

Accumulated net assets (June 30, 1925): \$68,397

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income</i> : ¹				
Fees (all kinds) paid by the students	\$65,319	\$86,913	\$101,825	\$85,422
Fees paid by patients, in all clinical departments	9,603	12,559	28,770	28,432
Miscellaneous receipts	3,704	22,811	7,810	4,335
Total amount of current income	\$78,626	\$122,283	\$138,405	\$118,189
Total amount of current expenditures	\$76,026	\$99,146	\$123,130	\$100,081
Net income for the year	2,600	23,137	15,275	18,108
Dividend	None	4,000	4,000	3,920
Net income to surplus	2,600	19,137	11,275	14,188
<i>Capital income (memorandum)</i> : ²				
Sale price of building	None	None	57,750	None

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment, investment, or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above. In 1922-23, the corporation received \$57,750 for the clinical building, which it now occupies as a tenant. Of the amount received for the building, \$30,847 was expended to liquidate an outstanding debt thereon.

² This is not intended by the School to be a complete statement of the items of capital income.

DENTAL SCHOOLS IN THE UNITED STATES

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Capital expenditures (memoranda):</i> ¹				
For reduction in principal of debt	\$4,225	\$23,928	\$35,478	None
For new equipment	10,671	7,574	11,502	\$1,253
For new construction (or land) ²	None	None	None	None
For improvement of the library	400	200	200	250
Total	\$15,296	\$31,702	\$47,180	\$1,503
Accumulated surplus	\$8,109	\$27,246	\$38,521	\$52,709
Average amount expended by the School per student (D.D.S.) per year	257	298	332	296
Average amount of all student fees paid to the School per student (D.D.S.) per year	221	261	274	252
<i>Details of current expenditures:</i>				
For interest on debt (including accrued interest)	846	2,592	1,455	None
For rent ³	6,217	3,325	3,925	7,247
For repairs	2,269	1,150	2,146	1,454
For research	50	316	43	71
For supplies used in the clinical departments ⁴	5,043	4,496	9,638	8,150
For salaries: for administration	7,000	11,542	11,200	11,200
For salaries: for teaching	30,442	38,614	47,037	37,903
For all other purposes	24,159	37,111	47,686	34,056
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(26)	(26)	(26)	(27)
Amount of their salaries as teachers	25,300	31,250	37,160	26,583
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Executive Dean's salary)	2,400	2,750	3,000	3,300
Smallest salary paid to a whole-time teacher of a dental subject	2,000	2,000	2,000	2,400
(Number of teachers of academic or medico-dental subjects)	(10)	(10)	(10)	(10)
Amount of their salaries as teachers	5,142	7,364	9,877	11,320
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	2,275	2,275	2,275	2,400
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,200	1,200	1,500	1,800

¹ This is not intended by the School to be a complete statement of the items of capital expenditure.

² In 1924-25 there was an expenditure of \$50,100 for land.

³ During 1921-23 the School shared ownership of the rented building.

⁴ The School's record of the general items of income and expense for the Infirmary are appended at the School's request:

	1920-21	1921-22	1922-23	1923-24	1924-25
<i>Income:</i> Fees paid by patients	\$9,603	\$12,559	\$28,770	\$28,432	\$34,520
Cost of supplies	5,043	4,496	9,638	8,150	8,930
Selling profit	\$4,560	\$8,063	\$19,132	\$20,282	\$25,590
<i>Expense:</i> overhead	16,850	17,113	22,231	25,737	27,220
Loss	\$12,290	\$9,050	\$3,099	\$5,455	\$1,630

The present writer notes that the recorded "loss" has been calculated by omitting to include in the income a proportionate share of the fees paid by the students who received instruction in the Infirmary. Throughout the four years in this record fully half of the number of hours prescribed in the curriculum for third and fourth-year students were devoted to clinical instruction in the Infirmary.

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 34. Of this total number, 3 were whole-time, 2 half-time, and 6 part-time or occasional teachers of academic or medicodental subjects; 8 were whole-time, 3 half-time, and 12 part-time or occasional teachers of dental subjects; 16 were "full" professors; 16 were associate or clinical professors; 2 were lecturers by title; all received salaries; 10 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	246	222	303	336	384	346
Women.....	5	4	3	1	1	0
From other countries.....	0	1	1	1	1	0
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	243	221	296	333	376	341
Admitted after examination.....	0	0	0	3	1	1
Admitted to advanced standing.....	0	0	6	4	4	8
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	0	0	0	3	2	3
Denied further instruction because of deficient scholarship.....	2	1	0	0	0	1
GRADUATES (D.D.S.)						
Total number of graduates.....	136	11	40	32	111	87
Women.....	2	0	2	0	1	0
Admitted to practice in other countries.....	No available data					
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	3	2	2	5	10	7
Percentages of failures in such state-board examinations.....	7.0	40.0	5.0	0	0.9	1.2

Summer courses in clinical dentistry (June, July, August, and September): since 1921; attendance: 1922—53; 1923—62 regularly, 16 irregularly; 1924—56; 1925—39

Courses for dental mechanics: from 1918 to 1924;¹ attendance: 1921-22—88; 1922-23—67; 1923-24—32

No course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: actively in progress in 1924-25, on the anatomy of the human brain; treatment of cancer, pyorrhea, and other suppurative conditions of the oral cavity; no publication in 1924, one in 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service, but a current file is kept of the needs of communities as they come to the School's attention, and efforts are made to supply them

No effort has been made by the School to determine recurrently the quality of the instruction as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: December, 1921

The foregoing data have been verified in detail by the Executive Dean

¹The courses for dental mechanics were instituted at the request of the U. S. Veterans Bureau in its program for the rehabilitation of disabled soldiers. There was no need for continuance of the courses after June 30, 1924.

SUMMARY

In a discussion of the work and influence of the Dental Educational Council, attention was drawn to the fact that, although since 1918 the Council has repeatedly published a standing resolution to the effect that a school conducted for profit to an individual or to a corporation shall be rated Class C, eight commercial schools were given the grade of A or B in 1920, but by 1924 and again in 1925 the number of exceptions had been reduced to one (page 107). The Atlanta-Southern Dental College, proprietary from the date of its organization, has been favored with a Class B rating continuously since 1918. The Council's inconsistency seems to have been an expression of partiality to a number of the stockholders and managers of the School—men who are widely esteemed both personally and professionally, and who have held or now occupy influential positions in national dental organizations, one of them being a senior member of the Council and also the President of the American Dental Association (1925-26). The Council's failure either to postpone a public rating while it gave this School a suitable opportunity to become acceptable by reorganization on a non-proprietary basis, as had been done effectually for other schools, or to grade the School Class C, indicated a regrettable degree of submission of a judicial function to extraneous considerations, and seemed to justify prevalent doubts as to the Council's ability to perform all of its public functions impersonally and with educational sincerity. That the Council has encountered exceptional obstacles in the way of its purpose to give the Atlanta College its true rating must be conceded, but the situation clearly reveals the potency of some of the surviving commercial influences in dental education. This School has exemplified the narrow purpose of the old Atlanta Dental College to "stand alone for the teaching of dentistry apart from an institution teaching medicine or other allied sciences," and in this respect is one of the last of its kind. In its independence, the School has remained completely isolated. Although the important Grady Hospital is situated directly across the street, the School has made no provision for effective instruction of its students, in the correlations between clinical dentistry and clinical medicine, in that or in any similar institution. Recently, however, the School has sought affiliation with one of the Georgia universities, but thus far unsuccessfully.

The two buildings that the School has been occupying as a tenant are generally inadequate and the facilities deficient. The new main building and the annex for anatomy, with their improved equipment, will effectually remove these physical disabilities. Despite the age of the two schools from which Atlanta-Southern was evolved, the library contains only 404 volumes and has been inactive.¹ In 1924-25, thirty-two of the thirty-four teachers were "professors," and the total amount of the salaries for instruction was only \$38,313. Of this amount the eleven whole-time teachers received salaries ranging from \$1800 to \$3600.² Although the attention of the Faculty has been confined to the undergraduate curriculum, high standards of instruction have not prevailed. During the years 1918-25, only nine students were required to repeat a course and only four students were dropped because of deficient scholarship, although throughout this period of eight years a high-school education or the equivalent was sufficient for admission, and the annual *maximum* attendance ranged between 222 and 384.

Since 1921-22, when the movement to require at least one year of approved work in

¹ This number of books in the library, confirmed for 1925, was the number stated in 1921. According to the accompanying financial record, however, \$650 was paid for additional volumes in 1922-24; an expenditure of \$200 for this purpose in 1924-25 has also been reported. Neglect of the library is very common in dental schools, particularly where commercial methods predominate. That this situation is due chiefly to absence of scholarly interest rather than to lack of funds, however, is well known. A very clear indication of this fact was given by a leading officer and stockholder of this School, who is widely regarded as a representative spokesman for dentistry, when, responding to an enquiry about the small collection of books that constituted the library in a room devoted chiefly to other purposes, he said decisively: "Oh, I never took any stock in a library."

² Such conditions helped the proprietary corporation to reduce its indebtedness of \$60,500 in 1918-19 (the second year after the merger) to nothing on June 30, 1923, and to maintain profits.

an academic college for admission was effectually initiated, the number of schools remaining on a high-school foundation, Atlanta-Southern among them, has been decreasing. Meanwhile the total attendance at Atlanta-Southern has risen from 296 in 1920-21 to 364 in 1925-26. This increase is not so great as might have been expected from the common tendency to seek a short cut to the professional degree. The widespread knowledge that the College was proprietary — and, according to the published standards of the Dental Educational Council, a Class C school — and that a diploma from such a school would steadily decrease in value, probably acted as a deterrent. Data pertaining to the attendance during the past few years is shown in the accompanying table. The geographical distribution of the students, in 1924-25, is indicated on page 316.

CLASSIFICATION OF THE ATTENDANCE AT THE ATLANTA-SOUTHERN DENTAL COLLEGE: 1921-26

	<i>Percentage resident in Georgia</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>	<i>Graduates</i>
1921-22	27	95	89	116	33	333	32
1922-23	23	83	90	88	110	371	111
1923-24	24	81	83	87	88	339	87
1924-25	25	97	77	87	85	346	85
1925-26	19	105	90	79	90	364	...

It is too late in the evolution of dentistry and of dental education successfully to fortify the existence of independent dental schools, for all of them, in principle and in fact, have plainly ceased to be desirable. The most logical fate for the Atlanta-Southern Dental College appears to be absorption by Emory University, and coordination with the Emory School of Medicine, although the development of health-service education in Atlanta by Oglethorpe University, or by Mercer University, is a suggestive alternative. The Medical School of Emory University does not include any phase of oral health-service among the subjects formally listed in its curriculum (Announcement, 1925), although oral hygiene has been included informally in the instruction in internal medicine, and since 1924-25 the medical seniors attend four lectures on oral and dental surgery. These lectures are given by the Associate in Oral and Dental Surgery, who is also the Visiting Oral Surgeon at the Grady Hospital — and, independently of these relationships, is the Professor of Anesthesia and Clinical Professor of Oral Surgery in the Atlanta-Southern Dental College. Very recently, as a further step in the evolution of instruction in oral health-service at Emory, this lecture course in oral and dental surgery has been extended by clinical instruction in dentistry (two hours weekly) in the Dental Division of the Out-patient Department of Wesley Memorial Hospital, which is situated on the University grounds and has four Visiting Oral Surgeons, each of whom holds the D.D.S. degree. The Emory Division of the Grady Hospital has a Section in Oral and Dental Surgery, where the Associate in Oral and Dental Surgery, who gives the lectures indicated above, and an Instructor in Oral and Dental Surgery are respectively Visiting Surgeon and Assisting Visiting Surgeon of the Section, and also members of the Medical Faculty.

The Professor of Physical Diagnosis, the Professor of Physiology, and the Associate Professor of Physiology at the Atlanta-Southern Dental College are respectively Instructor in Surgery, Professor of Surgery, and Instructor in Surgery in the Medical School of Emory University. The Professor of Surgery is also Visiting Surgeon to the Grady and Wesley Memorial Hospitals. These positions in the two schools are held independently of each other and do not represent avowed inter-institutional cooperation. The responsibility for a situation as anomalous as this, at public-service institutions that complement each other, deserves the attention not only of the faculties concerned, but also of the entire body of people whose welfare is affected. This would seem to be particularly true in a city where oral hygiene receives the special attention that is accorded to it in the public schools of Atlanta.

The last official record of the annual results of the license examinations includes these

comparative data for percentage of the graduates of this School who failed, in the number of states indicated by the figures in parenthesis: 1925. — 4.7 (8); U. S. schools collectively, 11.3. 1918-25 (cumulative). — 3.8 (12); U. S. schools collectively, 12.6.

GENERAL COMMENT

OF the five contiguous states, Tennessee maintains three dental schools, but North Carolina, South Carolina, Florida, and Alabama contain none. The need for increased and improved oral health-service in all parts of this southeastern region is urgent. The size and importance of Atlanta suggest that an excellent dental school in this city would help effectually to meet the need. Atlanta presents nearly all of the general conditions that ordinarily favor the maintenance of a dental school as an integral part of a good university, in effective accord with a first-class medical school, and closely associated with an active hospital and dispensary. If the leaders in health service in Atlanta appreciated the local need for a school of dentistry of this character, it would doubtless be created.

The establishment of a centre for health-service education including a good dental school, in Duke University, at Durham, North Carolina, would resolve most of the problems of dental education in the Southeast. Durham has a larger population than Ann Arbor, Michigan, or than Iowa City, Iowa, where Class A dental schools have ample

GEOGRAPHICAL DISTRIBUTION OF THE STUDENTS AT THE ATLANTA-SOUTHERN
DENTAL COLLEGE: 1924-25

<i>States (20), and foreign countries (1)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Alabama	16	8	10	9	43
Florida	13	3	7	10	33
Georgia	22	17	20	26	85
Louisiana	3	1	3	2	9
Mississippi	5	3	6	3	17
North Carolina	14	35	28	23	100
South Carolina	7	6	7	4	24
Tennessee	7	3	2	1	13
Virginia	1	1	2	1	5
Bahamas, Indiana, Iowa, Maryland, Ohio, Oklahoma, Pennsylvania, Wisconsin — one each	4	0	2	2	8
Kentucky, New Jersey, Texas, West Virginia — two or three each	5	0	0	4	9
Total	97	77	87	85	346

opportunity to teach all aspects of clinical dentistry. The importance of such a development, for North Carolina particularly, is suggested by the accompanying data for the geographical distribution of the students at the Atlanta School in 1924-25. The figures show that North Carolina contributed a larger number of students than Georgia.

The data also indicate that the higher the educational standards rose in Tennessee, the larger became the number of its citizens who preferred to obtain the professional degree from a proprietary school in one year less than the five required by either of the Class A schools in that state. Some years hence the State Board of Dental Examiners might perform a useful function if it ascertained and stated publicly whether the Tennessee graduates of the "0-4" curriculum of the Atlanta School, after their admission to practice in the home state, charged their patients smaller professional fees than those of contemporary graduates of the "1-4" program of the Dental School

of the University of Tennessee. This will be found to be the case, if there is any truth in the common plea in behalf of inferior education in dentistry that its continuance would assure to the individual patient comparatively low fees for dental service.

IDAHO

Population: 486,597. Number of dentists, 279; physicians, 416. Ratios: dentists to population, 1:1744; physicians to population, 1:1170; dentists to physicians, 1:1.5
 Statutory requirements. *Dentistry*.—Preliminary education: graduation from a high school or its equivalent. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school

Dental school: none; medical school: none

ILLINOIS

Population: 6,921,342. Number of dentists, 4435; physicians, 10,743. Ratios: dentists to population, 1:1561; physicians to population, 1:644; dentists to physicians, 1:2.4

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a four-year accredited high school or its equivalent. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from an approved medical school having a four-year curriculum; and in addition, one year of interne service in a hospital

Location of the dental schools (3): Chicago; medical schools (5): Chicago

CHICAGO

Population: 2,968,922. Number of dentists, 2928; physicians, 5729. Ratios: dentists to population, 1:1014; physicians to population, 1:518; dentists to physicians, 1:2.0

Number of dental clinics or infirmaries, 35; hospitals, sanatoriums, and charitable institutions, 126; hospitals approved for internships, 32

Dental Schools: (1) Chicago College of Dental Surgery (Loyola University), (2) Northwestern University, (3) University of Illinois. *Medical Schools* (5): Loyola University, Northwestern University, Rush Medical College (University of Chicago), University of Illinois, and Chicago Medical School

(1) CHICAGO COLLEGE OF DENTAL SURGERY; DENTAL DEPARTMENT, LOYOLA UNIVERSITY

Location: 1757 West Harrison Street; two and one-fourth miles from the centre of the city

General character: integral part of Loyola University. (See the "Summary," page 322.) The

Professor of English in the Dental School is a member of the Faculty of the College of Arts and Sciences. See "Relation of the School of Medicine," below

Organized: in 1884. The Chicago College of Dental Surgery was an outgrowth of the Collegiate Department of the Chicago Dental Infirmary. The latter was chartered, in 1883, as a graduate school of dentistry for the instruction of physicians desirous of becoming dental practitioners; but, after a year's experience, it was found that a school of that kind could not be conducted successfully and the institution was re-chartered as an undergraduate dental school, which it has remained. The Chicago College of Dental Surgery was independent and proprietary from 1884 to 1889; proprietary but associated, as the Dental Department, with Lake Forest University (Lake Forest, Illinois) from 1889 to 1906, and with Valparaiso University (Valparaiso, Indiana) from 1906 to 1920. The College, independent and proprietary during 1920-21, was re-incorporated in December, 1921, as an independent and non-proprietary educational institution; and continued as such until December, 1923, when it was affiliated with Loyola University

Building: erected in 1893-96; special improvements were made in 1921, 1922, and 1923; total floor area, 51,432 sq. ft.; one and one-half blocks from the laboratory building of the Loyola School of Medicine and two miles from the clinical building (Mercy Hospital and Mercy Clinic)

Infirmary: in the dental building, with five accessory rooms; total floor area, 15,230 sq. ft. Total number of chairs in active use, 199, including groups reserved for special purposes: crown and bridge work, 20; full dentures, 17; exodontia, 5; orthodontia, 4; diagnosis, minor oral surgery, and roentgenography, 1 each

Relation of the School of Medicine (Class A): the dental students receive all of their instruction in the medico-dental sciences in the dental building. The Professor of Anatomy and the Associate Professor of Biology in the Dental School hold the same or related positions in the Medical School. Students conditioned in anatomy are given further instruction in the anatomical laboratories in the Medical School. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction in 1924-25: Cook County Hospital (directly across the street)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for general surgery and oral surgery. Part of one ward has been reserved for patients who require dental and oral diagnosis, and plastic and oral surgical operations

Number of dental internships (no externships), held by an officer of the School, in the Hospital in 1924-25: one

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: instruction by the Professor of Oral Surgery and Oral Pathology; to teach methods of diagnosis, and oral surgery, under the conditions prevailing in a Class A hospital

Library: room, 2029 sq. ft.; whole-time librarian. Contains 3700 bound and 6 unbound volumes, and 2312 pamphlets (all effectively card indexed). Of the volumes, approximately 3200 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Library in the School of Medicine of the University of Illinois (one block), which is open to all citizens of the state; Library of the School of Medicine of Loyola University (one and one-half blocks)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: eight students; total amount, \$1890, all of which was provided by the School

Dean: part-time officer; also Professor of Oral Surgery and Oral Pathology, and Chairman of the Division of Diagnosis. (President of the Seventh International Dental Congress, 1926.) *Dean of Students*: part-time officer; also Professor of Operative Dentistry. (President of the American College of Dentists, and also Editor of the *Journal of the American Dental Association*.) *Dean's executive assistant*: Registrar; whole-time officer

Minimum academic requirement for admission to the first-year class, in September, 1924: "graduation from a high or other secondary school offering a four-year fifteen-unit course of instruction approved or accredited by its state university or its state department of public instruction, or like standardizing agency of equal rank"; attested by a Dental Student's Qualifying Certificate issued by the State of Illinois (since 1921)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

Beginning in 1926-27 the School will conduct its work through the agency of these three curricula:

- (1) Four years (professional); entrance requirement: one year of approved work in an accredited academic college. Degree: D.D.S.
- (2) Five years (combined academic and professional); same as curriculum 1, above, except that the year of approved academic work will be conducted in the dental and medical buildings by members of the Faculty of the Academic College of Loyola University, and under its supervision. Degree: D.D.S.
- (3) Three years (professional); entrance requirement: two years of approved work in an accredited academic college. Degrees: B.S. and D.D.S. at the end of the third year. The second and third years will be lengthened to 10 months each. Provision will be made for graduate work

Curricula 1 and 2 exemplify the 1-4 plan; curriculum 3, the 2-3-graduate plan. The School has had no experience with either, but, after a trial of both, expects to adopt the one that proves to be the better

Number of graduates (1885-1925): 4614; average per year, for forty-one years, 113

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 473; proportion from Illinois: 1922-23—65 per cent; 1923-24—65 per cent; 1924-25—64 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—22,721; 1921-22—26,646; 1922-23—27,650; 1923-24—28,943; 1924-25—26,900

Number of visits, sittings, or operations: 1920-25—no available data

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-25—none. By the Professor of Oral Surgery in the presence of senior students: 1920-21—150; 1921-22—255; 1922-23—325; 1923-24—331; 1924-25—354

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1921), Class A

FINANCIAL DATA

Estimated value of land and building, \$282,000, and equipment, \$102,937; total, \$384,937 (June 30, 1925)

General debt on the School (June 30, 1925): none

Accumulated net assets (June 30, 1925): \$518,395

Data for years ending on December 31	(1) 1920	(2) 1921	(3) 1922	(4) 1923
<i>Current income:</i> ¹				
	<i>Proprietary</i>		<i>Independent but non-proprietary</i> ²	
Fees (all kinds) paid by the students	\$90,300	\$105,000	\$123,828	\$135,076
Fees paid by patients, in all clinical departments	77,422	85,537	96,636	121,174
Interest on investments	None	None	797	1,763
Miscellaneous receipts ³	2,525	4,631	5,840	2,844
Total amount of current income	\$170,247	\$195,168	\$227,101	\$260,857
<i>Total amount of current expenditures</i>	\$169,773	\$171,193	\$197,855	\$236,828
Net income for the year	474	23,975	29,246	24,029
Surplus paid to trustees or owners	None	None	...	...
Dividend paid to stockholders	None	None	...	...
Surplus converted into endowment	None	10,000	10,000	8,465
Net income to surplus	474	13,975	19,246	15,564
Accumulated endowment ⁴	None	10,000	20,000	28,465
<i>Capital income:</i> ⁵				
Interest on endowment ⁴	...	...	291	850
<i>Capital expenditure:</i> ⁵				
Reduction in principal of debt	3,000	12,000	None	None
Average amount expended by the School per student (D.D.S.) per year	428	401	460	469
Average amount of all student fees paid to the School per student (D.D.S.) per year	228	246	288	267
<i>Details of current expenditures:</i> ⁶				
For interest on debt	2,970	2,820	2,100	None
For repairs	4,510	7,420	12,926	26,465
For new equipment }				
For research ³	None	2,175	2,548	2,144
For improvement of the library	325	735	1,750	1,003
For supplies used in the clinical departments	31,743	32,789	36,238	52,776
For salaries: for administration	18,282	8,211	9,777	10,867
For salaries: for teaching	47,225	67,557	73,015	79,173
For all other purposes	64,718	49,486	59,501	64,400
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(26)	(24)	(28)	(31)
Amount of their salaries as teachers	32,205	44,907	48,525	51,188
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)

¹ During the calendar years 1920-23, there was no appropriation by the State or City, and no current income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² The affiliation of the College with Loyola University occurred on December 27, 1923. Comparable data for the calendar year 1924 are given in the tables in the Appendix. The Dean, despite the public relation of the School to the University, has repeatedly declined the invitation to present, as substitutes for the figures for 1923 and 1924, the corresponding data for the academic years 1923-24 and 1924-25, or to add the data for 1925. See the Appendix.

³ Includes the grants, in 1921-23, by the Research Commission of the American Dental Association (page 160).

⁴ The interest on the endowment has not been used for current expenses, but has been added to the principal, which on December 31, 1925, was \$66,675.

⁵ The statement of capital items is not intended by the School to be complete.

⁶ During the calendar years 1920-23, there was no payment on account of rent, new construction, or land.

	(1)	(2)	(3)	(4)
Data for years ending on December 31 ¹	1920	1921	1922	1923
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	\$3,000	\$3,600	\$4,000	\$4,500
Smallest salary paid to a whole-time teacher of a dental subject	1,600	1,725	1,800	2,025
(Number of teachers of academic or medico-dental subjects)	(13)	(13)	(14)	(14)
Amount of their salaries as teachers	15,020	22,650	24,490	27,985
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	3,000	5,000	4,500	4,500
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,600	1,800	2,000	2,400

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 46. Of this total number, 2 were whole-time, 3 half-time, and 6 part-time or occasional teachers of academic or medico-dental subjects; 10 were whole-time, 6 half-time, and 12 part-time or occasional teachers of dental subjects; 7 taught both general types of subjects, of which 3 gave whole-time, 1 half-time, and 3 part-time or occasional service; 15 were whole-time teachers in the Dental School only; 16 were "full" professors; 6 were associate or assistant professors; 6 were lecturers by title; all received salaries; 32 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1923; now six years in length

Advanced courses for dental practitioners: since 1885; attendance: 1921-22—37; 1922-23—70; 1923-24—56; 1924-25—59

Summer courses in clinical dentistry (June, July, August, and September): since 1885; attendance: 1922—124; 1923—127; 1924—172; 1925—205

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no dental extension teaching

Research: actively in progress in 1924-25. *Clinical*: on the most satisfactory modes of treatment of all types of infected pulpless teeth, and the histopathological changes in the tissues at the root apices of treated pulpless teeth. *Anatomical*: on the structure and blood supply of maxillary and mandibular bone and alveolar process, and of the alveolar process over the labial and buccal surfaces of the teeth; periosteal and central bone repair; physiological relationships of dental stress to the bone, and determination of the direction of the force necessary to produce a physiological reaction of the tissues; no publication in 1924, one in 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service. Applications are presented to the seniors, and the advantages for young practitioners in small communities are always explained to the graduating class

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research, but graduates are encouraged to engage in teaching and research. Eight of the alumni are or have been deans of dental schools; and many have become members of faculties of dental schools

¹See the first two footnotes on page 320.

STUDENTS AND GRADUATES: CHICAGO COLLEGE OF DENTAL SURGERY; DENTAL DEPARTMENT, LOYOLA UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
	<i>Records incomplete</i>					
Maximum attendance.....		405	449	456	544	603
Women.....			4	3	3	0
From other countries; chiefly from Japan, South America, and Canada.....		*	14	14	17	17
Negroes.....			7	9	7	4
Attendance at the end of the year.....	402	396	427	430	505	565
Admitted after examination.....		0	0	0	0	0
Admitted to advanced standing.....		36	22	23	10	2
From other countries, to advancing standing.....			0	2	0	2
"Repeaters" of one or more subjects.....			50	21	54	44
Denied further instruction because of deficient scholarship.....			19	26	23	11
GRADUATES (D.D.S.)						
Total number of graduates.....	245	92	108	50	100	117
Women.....			0	1	3	0
Admitted to practice in other countries.....			No available data			
Negroes.....			1	0	2	4
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	12	8	9	7	8	9
Percentages of failures in such state-board examinations.....	9.3	16.5	21.9	4.3	1.1	2.0

Visited: March and November, 1922; March, 1923; March, 1924

The foregoing data have been verified in detail by the Dean

SUMMARY

THE Chicago College of Dental Surgery, since its foundation, has been conducted by men of exceptional influence in organized dentistry, who, until 1921, made it one of the strongest supports of the proprietary system in dental education. In 1921 the conversion of the College to a non-proprietary condition, in 1923 to the status of affiliation with a university, and recently to complete integration with that University, are events of national significance in the conflict between private and public interests in the conduct of dental schools. The official statement by which the affiliation between the College and the University was abrogated, and the College became an integral part of the University as of January 2, 1926, is quoted here by permission of the President of the University:

"We, the undersigned Trustees of the Chicago College of Dental Surgery, Dental Department of Loyola University, in order the more explicitly to indicate the fact that as the Board of Trustees of the Chicago College of Dental Surgery we hold and exercise our authority dependent upon, and in all details of its tenure and use subject to the authority and direction of the Board of Trustees of Loyola University, and that the said Chicago College of Dental Surgery is an integral part of Loyola University, do hereby freely, formally, and explicitly relinquish to said Board of Trustees of Loyola University all the authority, powers, and privileges granted and secured to us collectively and individually in the contract agreement entered into between Loyola University and the Chicago College of Dental Surgery in December, 1923, and published in *The Bur* of March, 1924." (To which, on the copy presented to the Carnegie Foundation, is appended the signatures of the four Trustees of the College.)

The Endowment Fund, which had been accumulated from the annual surpluses (footnote 4, page 320), will be held by the University and its income used for the original purposes. It is the hope of the University that the Fund may be increased to large proportions by public benefactions. The plan on which the Fund was accumulated had been encouraging

the Chicago College of Dental Surgery to promote excessive attendance. This School, one of the group of fourteen that will not raise the minimum entrance requirement to one year of work in an academic college before 1926-27, has been overcrowded for several years, the present first-year class numbering 235 (December, 1925). Since 1920-21 the School has not been indifferent to high standards of scholarship, for, besides enforcing its published entrance requirements, it has steadily endeavored to improve the instruction and the work of the individual student. The accompanying data indicate the number of students who, during the past few years, were obliged to repeat courses or to discontinue because of deficiencies in their work.

NUMBER OF STUDENTS AT THE CHICAGO COLLEGE OF DENTAL SURGERY WHO, BECAUSE OF DEFICIENT SCHOLARSHIP, WERE OBLIGED TO REPEAT COURSES OR TO DISCONTINUE: 1918-25

	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25
"Repeaters"	No available data		50	21	54	44	24
Discontinued	No available data		19	26	23	11	13
Total maximum attendance	No record	405	449	456	544	603	658

The Dental Educational Council, in its latest booklet on the "minimum requirements" for a Class A rating, makes the following significant statement (1922, page 12): "A school cannot be considered acceptable nor remain acceptable if it enrolls classes of a size beyond its fair capacity for more than two years in succession." There is no public evidence that the Council has given this important "requirement" serious attention. It is doubtful whether any dental school anywhere now has the resources in teachers, facilities, and funds to justify a belief that it may suitably accept more than about 150 students in a freshman class and more than about 125 in a senior class. Unless the mechanical methods of standardized mass production are permitted to supersede those of sincere personal concern for the careful development of ability and proficiency in the students individually, proper restrictions will be put upon the admission of students in numbers beyond a school's proved capacity to maintain reputability in this important regard. It is unfair to the students to overcrowd a dental school for any purpose. Obviously the improvement of dentistry will promote the public welfare, and the dental schools are primary agents for the purpose. Every dental faculty should demonstrate to the citizens of its own community that, in order to advance oral health-service, the dental school requires benefactions sufficient to support effectual endeavors to discover means of preventing oral maladies and, above everything else, to enable the School, by close personal attention, to develop a high degree of capability and a true professional responsibility in the individual practitioner.

Affiliation with the University has not as yet afforded the School additional financial support nor has it brought the School into intimate relationship with the Medical School, but the requirement of a year of approved work in an accredited academic college, beginning in 1926-27, will doubtless give the School the advantage of close association with Loyola's Academic College. Recently there have been notable improvements in the equipment, and the library has been enlarged and made more useful. The Faculty confines its attention to a narrow range of interest, and graduate work has not been attempted. The School, having an excessive attendance, needs a greater number of able and experienced teachers at higher salaries. In 1923 forty-five teachers were paid only \$79,000; in 1924 forty-six received only \$88,000. On such salaries a surplus in Chicago is not "earned." This School is one of the few that have given research financial support, but the expenditures on this account since 1920 have not been productive of commensurate original results — during 1924 and 1925 there was only one publication of research. In 1922-23 an appropriation by the Research Commission of the American Dental Association, for the furtherance of research, was not used because the teachers were not sufficiently interested to proceed (page 160).

Data showing the geographical distribution of the students, in 1924-25, are presented

in the accompanying table; relating to students, graduates, and results of license examinations in recent years, on pages 338-339.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT LOYOLA UNIVERSITY: 1924-25

<i>States (33), territory (1), and foreign countries (5)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Arkansas	0	0	2	3	5
Canada	4	2	0	1	7
Hawaiian Islands	4	0	5	0	9
Illinois	150	118	74	76	418
Indiana	10	5	6	14	35
Iowa	5	2	3	2	12
Kentucky	2	0	0	0	2
Michigan	12	15	13	3	43
Minnesota	2	3	2	4	11
New York	2	1	2	2	7
North Dakota	0	2	2	2	6
Ohio	2	2	0	1	5
South Dakota	0	2	2	3	7
Utah	4	2	2	3	11
Wisconsin	11	10	10	10	41
British Guiana, Connecticut, Georgia, Louisiana, Maine, Mexico, Mississippi, Missouri, Montana, Nebraska, New Mexico, Palestine, Rhode Island, Texas, Vermont, Virginia, Washington, West Virginia, Wyoming—one or two each	8	7	4	1	20
Idaho, Japan, Kansas, Oklahoma, Pennsylvania—three or four each	5	6	5	3	19
Total	221	177	132	128	658

The curriculum of the Loyola Medical School includes the various specialties, but the School does not offer a course in odontology, stomatology, or any aspect of clinical dentistry. There are two dentists on the staff of the Out-Patient Department of Mercy Hospital, but none in the service of the other hospitals with which the University is closely affiliated. Neither of these dentists is a member of the Dental Faculty.

(2) DENTAL SCHOOL, NORTHWESTERN UNIVERSITY

Special note. The status of this School, especially in its relation to the Medical School, and in its facilities, is about to undergo important changes. See "New building," on page 325

Location: Lake and Dearborn Streets; two blocks from the City Hall, in the centre of the city

General character: integral part of Northwestern University

Organized: in 1891; acquired the equipment of the University Dental College (Chicago, 1887-91), which had been affiliated with the Chicago Medical College (now the Northwestern University Medical School). Absorbed, in 1896, the American College of Dental Surgery (1885-96); by agreement the graduates of the latter, in and after 1890, might, on the recommendation of a special committee of the Faculty appointed for each applicant, become alumni of the School. In 1897, under similar conditions, the School also absorbed the Northwestern College of Dental Surgery (1885-97)

Building: the School occupies, as a tenant, part of the fourth, and all of the fifth, sixth, and seventh floors of the "Northwestern University Building" (with the Schools of Law and Commerce on lower floors). Erected in 1872; purchased by the University and extensively remodeled in 1902. Extensive changes were made, in the floors occu-

pied by the Dental School, in 1915, 1919, and 1922. Total floor area used for instruction in dentistry, 69,000 sq. ft. Distance from the main site of the University (Evanston), twelve miles; from the buildings of the School of Medicine (Chicago), three miles

New building: in process of construction (October 1, 1925), on the Alexander McKinlock Memorial Campus, at Lake Shore Drive and East Chicago Avenue. In December, 1923, and in January, 1924, the University received from Mrs. Montgomery Ward, of Chicago, gifts amounting to \$4,233,000 for the construction and maintenance of a large building for the Medical and Dental Schools. Of the total amount of Mrs. Ward's gift, \$1,000,000 will be reserved as an endowment for the maintenance of the building. By action of the Board of Trustees, 59 per cent of the space in this building will be used by the Medical School and 41 per cent by the Dental School (96,000 sq. ft.). The new building will be occupied in October, 1926. See the Appendix

Infirmiry: in the "Northwestern University Building," with seventeen accessory rooms; total floor area, 18,000 sq. ft. Total number of chairs in active use, 130, including groups reserved for special purposes: prosthodontia, 35; children's clinic, 15; oral surgery, 7; advanced work, 6; examination, 2

Relation of the School of Medicine (Class A): since 1922 the freshmen and sophomores have been taught portions of the laboratory courses in anatomy and physiology, in separate classes, in the laboratories of the Medical School, by members of the Medical Faculty. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; one teacher of a dental subject gave medical students instruction in clinical dentistry

Hospitals in which dental students received accredited instruction in 1924-25: Cook County Hospital (three miles), and St. Luke's Hospital (two miles)

Clinical facilities in the Hospitals where dental students received instruction in 1924-25: complete for all aspects of medicine and surgery

Number of dental internships (2) and externships (11), held by officers (11) and students (2) of the School, in the Hospitals in 1924-25: thirteen

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: seniors regularly attend clinics at both Hospitals, and autopsies at the Cook County Hospital; to present a wider range of cases in oral surgery, and autopsies in connection with the course in general pathology

Special Clinic for Children: this Clinic, the first of its kind in a dental school, was opened on October 21, 1922, a part of the building having been remodeled for the purpose. It has a separate organization, with a director, superintendent, social economist, demonstrators, and clerks. The Clinic has fifteen chairs and serves children of indigent parentage at minimum expense. Children are taken to the Clinic, from the lower grades of the public schools, by Health Department nurses. This Clinic presents special facilities for the instruction of dental students in the management and treatment of children, and in the care of the deciduous and permanent teeth during the period of greatest susceptibility to derangement; also for the practical training of dental hygienists; for the thorough teaching of orthodontia, especially as a subject of graduate study; and for research in the field of prevention of dental disease

Library: three rooms, 5400 sq. ft.; two whole-time librarians. Contains about 10,000 bound volumes (including 2000 in German, French, Italian, and other foreign languages), about 100,000 unbound copies of extra numbers of journals, and 750 pamphlets (all effectively card indexed). Of the volumes, practically all relate to dental subjects. Conducts a "library extension bureau" for dentists, and circulates books and journals to all parts of the United States and Canada without charge, except for postage. The *Index of the Periodical Dental Literature* has been compiled under the direction of the Dean and

edited by him. Six volumes, covering the years 1839-90 and 1911-21, inclusive, and containing 2768 pages, have already been published (1925). The remaining volumes (1891-1910, and 1922 to date) are now being prepared

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Chicago Public Library (three blocks), John Crerar Library (two blocks), and Newberry Library (eight blocks)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: thirty students; total amount, \$7500; provided by the University in La Verne Noyes scholarships available to students who served in the Army during the World War

Dean: half-time officer; also Professor of Dental Pathology and of Operative Dentistry. *Assistant to the Dean*: whole-time officer; also Assistant Professor of Operative Dentistry and Superintendent of the Children's Clinic. *Secretary*: whole-time administrative officer; also Lecturer on Economics

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: uncertain

In the Announcement for 1925-26 appears the following statement: "Two new [additional] courses are announced for 1925-26. By arrangement with the College of Liberal Arts one may matriculate in the Dental School directly from high school for a five or six-year course, taking professional courses in the Dental School and arts courses in the College. This arrangement provides for technical training throughout the entire course [in each case] and offers college courses in three sciences — chemistry, zoölogy, and physics." A student who has had one year of approved work in an accredited academic college may be admitted to the first year of the usual four-year curriculum, or to advanced standing in the second year of the new five-year curriculum. Oral anatomy (144 hours) and prosthetic technics (96 hours), which are listed in the first year of the new five-year curriculum, take the place of physics (192 hours) in the first year of the conventional four-year curriculum, which otherwise is the same as the last four years of the new five-year curriculum. Two years of work in an academic college would not admit the student to the third year of the six-year curriculum without conditions, unless it included oral anatomy (144 hours), metallurgy (64 hours), and prosthetic technics (240 hours), in addition to the academic subjects usually required. In content, the six-year curriculum (5504 hours) differs from the five-year curriculum (4864 hours) in omitting comparative anatomy (16 hours),¹ in adding second-year courses in English (96 hours) and French or German (96 hours), and in requiring 128 hours more of prosthetic technics, 48 hours more of physiological chemistry, 16 hours more of operative technics, 16 hours more of oral prophylaxis, and 256 hours more of clinical practice. The final years in the three curricula are identical. Minor changes in these curricula have been announced for 1926-27

Number of graduates (1890-1925, including elected alumni of the absorbed colleges): 4650; average per year, for thirty-six years, 129

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 472; proportion from Illinois, in 1922-23—41 per cent; 1923-24—43 per cent; 1924-25—51 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated in the *General Clinic*: 1920-21—7617; 1921-22—10,808; 1922-23—17,829; 1923-24—12,579; 1924-25—8771

Number of persons treated in the *Children's Clinic*: 1922-23—1517; 1923-24—1684; 1924-25—1114

Number of visits, sittings, or operations in the *General Clinic*: 1920-25—no available data; *Children's Clinic*: 1922-25—no available data

Number of patients treated in the Hospitals, by dental students, under the supervision of representatives of the Dental School: 1920-25—none

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

¹ This was omitted from the Announcement, but included in the curriculum.

FINANCIAL DATA

Estimated value of the equipment used by the School (September 30, 1925): \$150,000, including that of the library and museum

General debt on the School, or carried by the University on the School's account (September 30, 1925): none

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$148,659	\$155,234	\$147,580	\$115,689
Fees paid by patients, in all clinical departments	56,381	88,900	139,732	120,102
Interest on endowment	None	None	66	66
Gifts	None	None	14,360	9,000
Miscellaneous receipts	12,427	5,526	5,088	6,240
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	None	46,210 ²
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	None	None	None	None
Total amount of current income	\$217,467	\$249,660	\$306,826	\$297,307
<i>Total amount of current expenditures</i>	\$215,243	\$249,517	\$307,379	\$297,307
Surplus for the year	2,224	143	.. .	None
Deficit	.. .	.. .	553	None
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above ²	None	None	None	4,210
Average amount expended by the School per student (D.D.S.) per year	379	478	617	833
Average amount of all student fees paid to the School per student (D.D.S.) per year	262	297	296	324
<i>Details of expenditures:</i> ³				
For rent (paid to the University) ⁴	50,000	50,000	50,000	42,000
For repairs	111	1,917	11,715	948
For new equipment	4,200	11,300	6,500	None
For new construction (no land)	None	None	43,501	None
For research ⁵	2,774	897	2,377	2,475

¹ During the academic years 1920-24, there was no appropriation by the State or City; no money was borrowed; and all miscellaneous receipts are included in the recorded items above. The income from fees includes the amounts paid by all types of students.

² See the amounts paid to the University for rent. The data for the four years in this summary fail to give a complete indication of the University's financial support of the Dental School. In 1918-19 the University absorbed a dental deficit of \$41,276, in 1919-20 a dental deficit of \$89,778, after payment by the School of the rental in each case. The deficit for 1924-25 in the operation of the Dental School, including the rental, was \$84,615. The approved budget for 1925-26 provides for the payment by the University of an anticipated dental deficit of \$83,986, which includes the rental. See "New building," above, and the Appendix.

³ During the academic years 1920-24, there was no payment on account of debt.

⁴ The present building was purchased by the University with general funds, and a rental charged to maintain the productivity of the University's endowment.

⁵ In addition to the School's direct support of research during the four years indicated, members of the Faculty received annually a total grant of \$2400 from the Research Commission of the American Dental Association. For 1924-25 the School's expenditure for research was \$2683; the additional grant to members of the Faculty, by the Research Commission of the American Dental Association, was \$2400. The School has been raising a Dental Research Endowment Fund. Subscriptions amounting to \$104,028 have been recorded, of which \$60,267 have been paid. Income from the Fund will be available in 1926-27.

DENTAL SCHOOLS IN THE UNITED STATES

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
For improvement of the library	\$1,322	\$3,160	\$2,438	\$5,906
For supplies used in the clinical departments	22,822	28,387	46,761	41,060
For improvement of the museum	471	373	329	2,318
For salaries: for administration	11,573	11,873	12,893	13,530
For salaries: for teaching	75,319	82,325	86,992	104,849
For all other purposes	46,651	59,285	43,873	84,221
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(44)	(46)	(59)	(51)
Amount of their salaries as teachers	50,505	61,060	66,094	75,142
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary) ¹	5,000	6,020	6,524	7,000
Smallest salary paid to a whole-time teacher of a dental subject	1,500	1,800	1,800	1,800
(Number of teachers of academic or medico-dental subjects)	(16)	(14)	(14)	(15)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	24,814	21,265 ²	20,898 ²	29,707
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	3,200	5,000	7,000	7,000
In the Medical School	5,000	5,500	5,700	5,800
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	2,400	2,600	2,800	2,800
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	None	None	None	None

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 64. Of this total number, 3 were whole-time, none half-time, and 12 part-time or occasional teachers of academic or medico-dental subjects; 10 were whole-time, 11 half-time, and 28 part-time or occasional teachers of dental subjects; 3 taught both general types of subjects; 12 were whole-time teachers in the Dental School only; 14 were "full" professors; 15 were associate or assistant professors; 2 were lecturers by title; all received salaries; 17 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1915; now six years in length

Courses for dental mechanics: since 1921; attendance: 1921-22—9; 1922-23—18; 1923-24—1; 1924-25—7; discontinued in 1925

¹ In 1923-24 two whole-time teachers received \$7000 each; one, \$6000; one, \$5500; one, \$4000; three, \$3600 each; two, \$3000 each. In 1924-25, two whole-time teachers received \$7000 each; one, \$6500; one, \$5500; one, \$4500; one, \$4350; two, \$3000 each.

² The reductions for 1921-23 were due to decreased needs because of diminished numbers of freshmen and sophomores and of sections to be taught.

Courses for dental hygienists and dental assistants: since 1922; attendance: 1922-23—11; 1923-24—8; 1924-25—7

Graduate courses in dentistry: since 1922 (degree, M.S.); attendance: 1922-23—4; 1923-24—9; 1924-25—14

Advanced courses for dental practitioners: since 1905; attendance: 1921-22—65; 1922-23—84; 1923-24—95; 1924-25—103

STUDENTS AND GRADUATES: DENTAL SCHOOL, NORTHWESTERN UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	486	407	602	536	503	364
Women.....	8	6	8	7	3	4
From other countries; chiefly from Australia, Canada, France, China, Norway, and Sweden.....	14	24	49	45	49	36
Negroes.....	9	10	18	20	17	20
Attendance at the end of the year.....	380	388	567	522	498	357
Admitted after examination.....	30	19	44	2	0	0
Admitted to advanced standing.....	12	20	16	23	7	12
From other countries, to advanced standing.....	0	1	3	4	4	6
"Repeaters" of one or more subjects.....	20	18	26	22	20	16
Denied further instruction because of deficient scholarship.....	36	25	19	21	7	7
GRADUATES (D.D.S.)						
Total number of graduates.....	176	44	56	63	188	189
Women.....	1	1	2	4	1	1
Admitted to practice in other countries.....	2	0	1	0	3	1
Negroes.....	2	0	0	2	6	9
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	14	4	11	10	15	18
Percentages of failures in such state-board examinations.....	13.9	13.4	7.9	3.7	3.4	5.9

Summer courses in clinical dentistry (June, July, August, and September): since 1891; attendance: 1922—125; 1923—125; 1924—100 (the figures are close estimates); 1925—59

Dental extension teaching: courses for dental societies and study clubs; since 1920. (See "Library," above)

*Research:*¹ actively in progress in 1924-25, on pathological changes associated with chronic suppurative pericementitis (pyorrhea alveolaris); the apical conditions about teeth with treated and filled or partly filled root canals, largely by histological methods; laboratory diagnosis of focal infection; the permeability of tooth structures, especially with reference to their nutrition and the passage of toxic materials through them; the composition of saliva and blood from individuals with various types of oral abnormality; several publications in 1924 and 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: March and November, 1922; March, 1923; April and May, 1924

The foregoing data have been verified in detail by the Dean

¹ See footnote 5, page 327, for data pertaining to financial support of research.

SUMMARY

UNTIL recently, this School, despite its isolation from the University and from the Medical School, and its tenancy of the upper floors of a commercial building, attracted large numbers of students from practically every part of the United States, and from many foreign countries, owing chiefly to the reputation given to the School by the research and scholarship of the late Dean G. V. Black (1836-1915), one of the most eminent American dentists. Since 1921-22, when the entrance requirement became one year of approved work in an accredited academic college, the attendance has steadily decreased from 567 at the end of 1920-21 to 215 in 1924-25; now (1925-26) the number is 238. During the past sixteen years (1910-25), graduates of this School took their initial license examinations in thirty-nine states, a much wider territory from which students were drawn and to which practitioners were distributed than that for any other dental school, but in 1925 the number of states was only eight. A growing tendency among dental students to take their initial license examinations in the states where they obtain their professional degrees seems to account for this numerical decrease (page 331).

The School will soon be removed from an unattractive environment to the largest and most completely equipped building for the joint occupancy of medical and dental schools in existence. This exceptional building, now in process of construction, will be 300 feet long, 156 feet wide, and fourteen stories high, and will have a tower extending five stories above the top floor. The Medical and Dental Schools will be conducted independently in upper and lower halves of the building, rather than side by side in a vertical arrangement. Close correlation between scientific medicine and scientific dentistry, and between clinical medicine and clinical dentistry, may not be embarrassed by such a complete mechanical separation, but will hardly be facilitated by it. The Medical School will occupy the first seven floors; the Dental School, the eighth to thirteenth floors, inclusive. The fourteenth floor and basement will be used by both schools for special purposes. The tower will contain offices for the President of the University, for the Board of Trustees, and for the Alumni Associations; also a club room and restaurant for the faculties and alumni. Offices, the medical library, and a dispensary will be located on the three lower floors of the Medical School. The laboratories for the instruction of medical students in anatomy, bacteriology, biochemistry, pathology, pharmacology, and physiology will be placed on the fourth, fifth, sixth, and seventh floors. The laboratories in the medical sciences for the Dental School—separate from those for the Medical School—will be situated on the eighth, ninth, and tenth floors, where there will also be laboratories for dental technology, lecture halls and class rooms, club rooms, library and museum, and administrative offices. The dental and medical groups of teachers of a given medico-dental science will be a unit of organization under the general direction of the head of the corresponding department in the Medical School. Each laboratory in the Dental School will be equipped for forty students, and the classes will be divided into sections of forty for all laboratory instruction. The eleventh, twelfth, and thirteenth floors will be reserved for the dental clinics in eight separate departments: oral surgery, dentures, crowns and bridges, filling operations, pulp treatments, prophylactic and periodontal treatments, orthodontia, and a children's clinic. There will be a total of about 200 dental chairs, each of which, located directly in front of a window, will be placed in an operating stall approximately 7 ft. \times 12 ft. in size and equipped with the facilities of a small private dental office. The prosthetic laboratory for the denture and crown and bridge clinics will afford, for each student in either clinic, a laboratory bench as close to his chair as that in a private dental office. The maximum number of freshmen will be 150, and the total attendance of undergraduates will be limited to about 520. The building has been planned to give this number of students every possible convenience and facility for the most thorough training. In each laboratory and clinical department, and in the library, there will be accommodations for advanced students and investigators.

The library and the museum are among the most valuable and useful in dental schools. The Special Clinic for Children is not only an important addition to the School's facilities and to its opportunity for community service, but also sets an example that other schools in increasing number will wish to follow. In another relation, however—the payment to the University of a very large annual rental amounting to as much as 5 per cent interest on \$1,000,000—the School's predicament served for a time to discourage the movement to terminate proprietary control of dental schools (see footnote 2, page 327). This well-known illustration of the extraneous use of large surpluses in the conduct of the dental school, in an important university, enabled private owners plausibly to contend that the proprietary management of a dental school, "by keeping dental funds in dental hands," was better for dental education than a system in which the profits might be appropriated for the support of other departments in a university. The University continues to charge a heavy rental, but since 1922-23 there has been no surplus from which to pay it.

Members of the Faculty have been among the most prolific contributors to dental literature, especially in the publication of text-books, and also among the most productive in research. The Faculty has shown active interest in the development of an extensive series of courses and curricula. Thus far the School has had the largest attendance of graduate students (page 139). The facilities in the new building should give the School unusual opportunities to develop a full program in dental education. The "Dental Research Endowment Fund" promises to be an important factor for the promotion of dental research. Endowments of \$1,000,000 for the maintenance of the new building, and of \$4,000,000 for the support of teaching and research in the Medical and Dental Schools which Mrs. Ward has recently added to her original gifts (page 325), will afford exceptional resources for the development of the intellectual types of faculties that the new opportunities and the greater responsibilities of each School will require. Data showing the geographical distribution of the students, in 1924-25, are presented in the accompanying table; relating to students, graduates, and results of license examinations in recent years, on pages 338-339.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT NORTHWESTERN UNIVERSITY: 1924-25

<i>States(28), territories(2), and foreign countries(8)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Canada	3	0	3	5	11
Illinois	42	30	25	25	122
Indiana	0	2	4	3	9
Iowa	3	0	0	2	5
Michigan	5	3	2	2	12*
New York	0	1	1	3	5
North Dakota	0	3	2	2	7
South Dakota	0	1	4	1	6
Utah	1	2	4	0	7
Wisconsin	2	2	3	5	12
Australia, China, Connecticut, Czechoslovakia, Greece, India, Massachusetts, Missouri, Mississippi, Montana, New Jersey, New Mexico, Pennsylvania, Philippine Islands, Scotland, Washington, West Virginia — one each	4	5	3	5	17
Alabama, Arkansas, Hawaiian Islands, Idaho, Kansas, Minnesota, Nevada, Ohio, Russia, Tennessee, Texas — two or three each	8	2	8	7	25
Total	68	51	59	60	238

Unlike most medical schools, that of Northwestern University formally includes oral surgery in the curriculum. The seniors are given a required "lecture course and clinic" in oral surgery—"one-half the class each semester; one period a week" (24 hours). The course is given by the Professor of Oral Surgery, who holds the same chair in the Dental Faculty.

(3) COLLEGE OF DENTISTRY, UNIVERSITY OF ILLINOIS

Location: Harrison and Honore Streets; two miles from the centre of the city

General character: integral part of the University of Illinois. All of the departments of the University are located in Urbana, except the Colleges of Medicine and Dentistry and the School of Pharmacy, which are grouped in Chicago

Organized: in 1913, by absorption and reorganization of the Illinois School of Dentistry, which had been affiliated with the University since 1901, but was independent from 1898 to 1901 and the successor of the Columbian Dental College (1894-98). The School was closed during 1912-13, pending reorganization

Building: rebuilt in 1901 after its partial destruction by fire, while it was occupied by the College of Physicians and Surgeons, then the affiliated medical department of the University. Special improvements were made in 1913, 1914, 1915, 1917, 1921, and 1923; total floor area, 45,000 sq. ft. The building of the College of Medicine is adjacent

Infirmary: in the dental building, with five accessory rooms; total floor area, 5000 sq. ft. Total number of chairs in active use, 84, including groups reserved for special purposes: extraction, 6; examination and prosthetics, 2 each; demonstration, oral surgery, roentgenography, and therapeutics, 1 each

Relation of the School of Medicine (Class A): all of the medico-dental subjects except gross anatomy and histology are taught in the laboratories of the Medical School, by members of the Medical Faculty. The laboratory of gross anatomy for both schools is situated in the dental building. The dental students are given instruction in all of these subjects in separate classes. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction in 1924-25: Cook County Hospital (directly across the street)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for all aspects of medicine and surgery

Number of dental internships or externships, held by officers or students of the School, in the Hospital in 1924-25: none

Nature and specific purpose of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: the senior students are admitted to the instruction given to medical students in various special subjects such as syphilis; *attendance is optional*

Library (in the dental building): none, except a small circulating library of 24 volumes in the Infirmery

Library facilities elsewhere than in the dental building that are conveniently accessible to dental students: Library of the Medical School (adjacent building), containing 30,009 bound volumes, of which about 800 relate to dental subjects; also the library for the group of professional schools in the new Research Building (two blocks)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: twenty-seven students; total amount, \$3375, all of which was provided by the School

Dean: part-time officer; also Professor of Oral Surgery and Oral Pathology. *Assistant to the Dean*: whole-time officer; also Instructor in English. There is also a whole-time Business Manager of the group of professional schools

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: two years of approved work in an accredited academic college, beginning in September, 1928

Number of graduates (1914-25): 459; average per year, for twelve years, 38. (Number for the Columbian Dental College, 1895-98, data for 1897 not available—49; average per year, for three years, 16. Number for the Illinois School of Dentistry: 1899-1901—76; average per year, for three years, 25; 1902-12—447; average per year, for eleven years, 41; closed, 1912-13)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 162; proportion from Illinois in 1922-23—77 per cent; 1923-24—74 per cent; 1924-25—67 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—2820; 1921-22—3042; 1922-23—4305; 1923-24—4710; 1924-25—3331

Number of visits: 1920-21—7755; 1921-22—8365; 1922-23—11,838; 1923-24—12,952; 1924-25—8564 (the figures are estimates)

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-25—none

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$130,000, and equipment, \$90,000; total, \$220,000 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): \$55,000 at 6 per cent interest per annum (payable in 1932)

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$33,104	\$29,270	\$21,832	\$21,314
Fees paid by patients, in all clinical departments	15,714	18,696	29,287	36,362
University funds, additional to the income designated above:				
(a) Direct appropriation ²	19,692	51,338	50,352	50,293
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	25,900	38,732	35,149	37,784
Total amount of current income	\$94,410	\$138,036	\$136,620	\$145,753
<i>Total amount of current expenditures</i>	\$94,410	\$138,036	\$136,620	\$145,753
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	45,592	90,070	85,501	84,077
Average amount expended by the School per student (D.D.S.) per year	451	680	1,012	1,005

¹ During the academic years 1920-24, there was no surplus, no appropriation by the State directly or by the City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

² All fees paid by students, and by patients in the Infirmary, are turned into the general treasury of the University, and are not available for use by the College of Dentistry. The expenses of the College are covered by the general budget appropriation at the beginning of each fiscal year. The "direct appropriation" in this summary, stated in conformity with the uniform plan of presentation, is the amount of the budget appropriation for dentistry that exceeded the income from these fees.

DENTAL SCHOOLS IN THE UNITED STATES

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Average amount of all student fees paid to the School per student (D.D.S.) per year ¹	\$158	\$144	\$162	\$147
<i>Details of expenditures:</i> ²				
For reduction in principal of debt	None	None	None	None
For interest on debt	3,600	3,600	3,600	3,600
For repairs	1,298	912	624	469
For new equipment	1,808	5,453	3,990	2,965
For research ³		No available data ³		
For improvement of the library	2,079	2,050	1,620	1,341
For supplies used in the clinical department	11,300	11,400	11,600	14,700
For salaries: for administration	5,467	7,165	7,278	8,193
For salaries: for teaching	45,296	63,788	68,810	69,686
For all other purposes	23,562	43,668	39,098	44,799
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(34)	(35)	(33)	(30)
Amount of their salaries as teachers	34,146	50,588	54,910	55,486
Number of teachers of dental subjects who did not receive salaries	(1)	(1)	(1)	(1)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	4,500	5,000	5,000	6,000
Smallest salary paid to a whole-time teacher of a dental subject	3,500	3,500	3,200	2,000
(Number of teachers of academic or medico-dental subjects)	(19)	(18)	(18)	(19)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	11,150	13,200	13,900	14,200
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	3,000	3,000	3,200	3,500
In the Medical School	5,000	7,000	7,000	7,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,500	2,700	2,700	2,700
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	6,000	6,000	6,000	6,000

¹ The tuition fee for students resident in Illinois has been \$30 less than that for non-resident students (since 1922-23, inclusive).

² During the academic years 1920-24, there was no payment for rent, new construction, or land.

³ All other schools have indicated exactly or with a fair degree of accuracy the amount, if any, of the current income that was expended for research. This School, unable to provide such data, has presented, instead, some estimates of the proportion of the salaries for instruction that correspond to the time given by the teachers to research, on this plan of calculation: "A proportionate share of departmental budgets is indicated each year [to the University] as being the correct proportion of expenditure for research and investigation; this is an ideal estimate, rather than a practical sum set aside for research. . . . [Thus] if a report [from a teacher] indicates that approximately 10 per cent of an instructor's time is devoted to research, and his salary is \$3000, the University reports that \$300 as devoted to research." The total amounts of the salaries for instruction at this School that were thus reported as hypothetically expended for the promotion of research, during the four years of this record, were these: 1920-21—\$15,073; 1921-22—\$17,954; 1922-23—\$24,524; 1923-24—\$34,821. These figures indicate that, in 1923-24 for example, the teachers collectively devoted to research approximately 50 per cent of the hours of their service. Compare these figures with the amounts paid for instruction in the medico-dental subjects.

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 54. Of this total number, 2 were whole-time, none half-time, and 17 part-time or occasional teachers of academic or medico-dental subjects; 16 were whole-time, 2 half-time, and 17 part-time or occasional teachers of dental subjects; 16 were whole-time teachers in the Dental School only; 13 were "full" professors; 14 were associate or assistant professors; 2 were lecturers by title; 2 received no salary; 35 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1921; now six years in length

Advanced courses for dental practitioners: since 1925; June; attendance: 1925—3

Graduate courses in dentistry: since 1922 (degree, M.S.); attendance: 1921-22—1; 1922-23—1; 1923-24—2; 1924-25—3

Summer courses in clinical dentistry (June and July, and September): since 1920; attendance: 1922—40; 1923—65; 1924—20; 1925—25

Dental extension teaching: since 1925; lectures and clinics for dental societies and study clubs throughout the state

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses)

Research: actively in progress in 1924-25, on the occurrence of fusiform bacilli and spirochaetes in alveolar abscesses; bacteriology of pyorrhea; origin of dental caries; several publications in 1924 and 1925, including a notable volume, representative of research on the Pathology of the Mouth, by the Assistant Professor of Pathology in the Dental School and the Dean

STUDENTS AND GRADUATES: COLLEGE OF DENTISTRY, UNIVERSITY OF ILLINOIS

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	173	192	231	205	162	148
Women	7	7	4	7	4	6
From other countries; chiefly from Russia and Japan	10	9	6	19	6	14
Negroes.....	3	4	4	7	7	12
Attendance at the end of the year.....	153	182	209	203	135	145
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	8	13	3	21	5	6
From other countries, to advanced standing.....	5	2	5	15	3	3
"Repeaters" of one or more subjects.....	1	5	4	20	11	4
Denied further instruction because of deficient scholarship.....	4	30	10	12	5	2
GRADUATES (D.D.S.)						
Total number of graduates.....	71	14	23	41	48	70
Women	3	1	0	3	2	1
Admitted to practice in other countries.....	5	2	1	12	3	1
Negroes	1	1	0	2	1	2
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations	10	3	4	6	5	4
Percentages of failures in such state-board examinations.....	10.0	10.0	14.3	0	2.4	5.3

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service, although many dentists are placed in needy communities through correspondence with physicians, health officers, and others who may be interested

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: March, 1922; March, 1923; March, 1924

The foregoing data have been verified in detail by the Dean or his Assistant

SUMMARY

A FACULTY of unusual ability, close relationship with the Medical School in the laboratory work in the medical sciences, and generous financial support by the University, are notable conditions at this School, which is greatly in need of the improved facilities that might be supplied, on the new site, in the University's extensive building program for its professional schools in Chicago. During recent years, regardless of a regular decrease in attendance, there has been an increase in the expenditures for salaries for instruction, which in 1924-25, although far from adequate, amounted to \$61,471 for thirty-five teachers of dental subjects. Graduate instruction has been receiving attention, the educational usefulness of the School is expanding, and research is steadily in progress. The Dean of the School, who is a part-time officer, is represented actively in the standing committees of the Faculty by his Assistant, who also gives instruction in English. The Dean is "Associate Clinical Professor of Surgery (Oral and Dental)" in Rush Medical College of the University of Chicago, "Associate Attending Surgeon (Oral Surgery)" in the Presbyterian Hospital, which is connected with that Medical School, and Attending Oral Surgeon at the Children's Memorial Hospital and at the Country Home for Convalescent Children (Prince Crossing, Illinois). The latter two institutions are affiliated with the University of Chicago. Although the Dean has numerous official medical relationships, the School is in the medical centre of Chicago, and the Presbyterian Hospital, the University Hospital, the Cook County Hospital, the West Side Hospital, and other similar institutions are nearby, the dental students are not given required instruction in any hospital or dispensary. The undergraduate curriculum of the Illinois Medical School includes the common specialties, but there is no mention in it of odontology, stomatology, clinical dentistry, oral surgery, or any phase of oral health-service.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF ILLINOIS: 1924-25

<i>States (13) and foreign countries (10)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Illinois	38	20	17	10	85
Michigan	3	1	3	1	8
Russia	3	2	0	6	11
Alabama, Arkansas, Armenia, Canada, Finland, Germany, Holland, Indiana, Iowa, Montana, North Dakota, Norway, Pennsylvania, Poland, Syria, Utah, Washington — one each	5	4	3	5	17
India, New York, South Dakota—two each	4	0	1	1	6
Total	53	27	24	23	127

The dental curriculum for 1925-26 is unusual in the first year, in presenting bacteriology while the course in organic chemistry is in progress and before that in physiological chemistry is started. Pathology is taught in the second year, physiology in the third year. Metallurgy, which receives as much attention as bacteriology, is given in the second year, but could be included in the first year as appropriately as chemistry. In spite of the fact that English is included in both the high school and the academic college prerequisites for admission to the Dental School, a formal course in English (16 to 64 hours) is required in each of the four years of the dental curriculum. In the Medical School, English is required for admission, but courses in English are not included in the curriculum. Although,

since 1921, this School has required a year of approved work in an accredited academic college for admission, an amount of time approximately equal to one-half of the number of hours in the first-year curriculum is devoted to subjects that might be taught advantageously in the academic college. In the latter respect it is like several schools that have adopted the two-three-graduate plan as a more useful alternative. The new entrance requirement of two years of approved work in an accredited academic college, beginning in 1928, will facilitate improvement of these conditions, and will also favor better coördination of the medical sciences.

Data showing the geographical distribution of the students, in 1924-25, are given in the table on page 336; relating to students, graduates, and results of license examinations in recent years, on pages 338-339.

GENERAL COMMENT

EACH of the five surrounding states—Wisconsin, Indiana, Kentucky, Missouri, and Iowa—contains at least one dental school, the total number in these states being seven. Several cities now contain two dental schools, but Chicago is the only city in which there are three schools; and only two states contain a larger number—New York and Ohio with four each. Although for years Chicago was a centre of commercialism in dental education (page 49), it has ceased to be hospitable to the proprietary idea, and now is encouraging and supporting the development of its three dental schools in increasing accord with the highest requirements of professional education in the public service.

Chicago has long been the hub of organized dentistry. Besides containing a relatively large number of dental schools, the general office of the American Dental Association is situated in this city (58 East Washington Street), where the *Journal of the American Dental Association* is edited by the Dean of Students of the Dental School of Loyola University, who recently, as he retired from the presidency of the American Dental Association for 1924-25, was elected president of the American College of Dentists. The Dean of the Dental School of Loyola University is the President of the Seventh International Dental Congress (1926), and also President-elect of the American Association of Dental Schools (1926-27). The *Index of the Periodical Dental Literature* is edited, under the auspices of the American Association of Dental Schools and with the financial support of the American Dental Association, by the Dean of the Dental School of Northwestern University. Some of the most important text-books in dentistry have been published by members of each of the three local dental faculties. The Chicago Dental Society, one of the most active in the country, holds an annual meeting of national significance. The annual meetings of the American Association of Dental Schools, since its organization in 1923, have been held in Chicago. One of the five sections of the International Association for Dental Research has existed in Chicago since 1920. Three schools may be expected to thrive in this city, which, large and centrally located, has had a strong traditional interest in dentistry and contains an unusual proportion of influential dentists.

At present the three Chicago dental schools represent three different types: (1) a state university school (Illinois) that is generously supported financially and is closely associated with a school of medicine; (2) a university school (Northwestern) which has not been effectually associated with a medical school;¹ and (3) a school which for many years was proprietary, then recently became non-proprietary, and now is an

¹ This unfavorable condition will soon be removed (Appendix).

integral part of a university, but not yet intimately associated with the medical school (Loyola). The School that has been the most altruistic in its management and the broadest in its relationships has had the smallest attendance, although its faculty is one of high repute. The extent to which the three schools individually have recently ministered to local and general needs may be noted from the data in the accompanying table. Of these schools, Loyola, on the lower scholastic level since 1921-22 and until 1926-27, has nearly twice as many students as the other two combined, and lately has been preparing the largest number of dentists for service in the state and outside of it. The marked decline in the attendance at Northwestern, and the failure of the school in the state university to gain in numbers, since their adoption of an entrance requirement of a year of work in an academic college, indicate that the tendency among prospective dentists to seek the shortest and easiest routes into practice has not entirely disappeared. It is surprising to find that, compared with conditions in 1920-21, the

DATA PERTAINING TO THE THREE DENTAL SCHOOLS IN THE STATE
OF ILLINOIS: 1919-26

Total attendance

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Loyola (Chicago) ¹	396	427	430	505	566	612	711
Northwestern	388	567	522 ²	498	343	215	238
Illinois	182	209	203 ²	135	147	114	148
Total	966	1203	1155	1138	1056	941	1097

Proportion of students resident in the State of Illinois

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Loyola (Chicago) ¹	52	62	57	65	65	64	69
Northwestern	43	40	42	41	43	51	48
Illinois	66	69	71	77	74	67	69

Number of graduates

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Loyola (Chicago) ¹	92	108	50	100	117	124	126 ³
Northwestern	44	56	63	188	189	48 ²	69 ³
Illinois	14	23	41	48	70	19 ²	29 ³
Total	150	187	154	336	376	191	224

Classification of the total attendance

		First year	Second year	Third year	Fourth year	Total
Loyola (Chicago): ¹	1923-24	183	131	132	120	566
	1924-25	189	170	128	125	612
	1925-26	235	181	169	126	711
Northwestern:	1923-24	53	58	45 ²	187	343
	1924-25	55	50	56	54 ²	215
	1925-26	58	51	60	69	238
Illinois:	1923-24	30	24	19 ²	74	147
	1924-25	44	23	24	23 ²	114
	1925-26	45	51	23	29	148

¹ Proprietary until December, 1921; thereafter independent though non-proprietary until December, 1923.

² The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

³ The number of seniors (December, 1925).

present proportion of students resident in Illinois is the same at the school in the state university but is larger at each of the other two schools.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the Illinois schools who failed, in the number of states indicated by the figures in parenthesis:

1925.—Illinois, none (2); Loyola, 1.7 (9); Northwestern, 3.4 (8); U. S. schools collectively, 11.3.

1910-25 (cumulative).—Illinois, 9.4 (24); Northwestern, 11.9 (39); U. S. schools collectively, 14.2.

1924 and 1925 (cumulative).—Loyola, 1.9 (?); U. S. schools collectively, 11.8.

The Illinois State Board of Dental Examiners, cognizant of such arbitrary classifications of dental schools as that published by the Department of Education of the State of New York (page 476), and desirous of discouraging unjust discriminations against the schools in Illinois, recently adopted the following resolutions:

Whereas, it has come to the attention of the Illinois Dental Examining Board that the graduates of dental schools located in the State of Illinois are not admitted to the examinations for dental license in certain states in which are located dental schools; and

Whereas, all the dental schools located in the State of Illinois, namely, Chicago College of Dental Surgery, [the] Dental Department of Loyola University, Northwestern University School of Dentistry, [and] University of Illinois College of Dentistry, are classified as Class A by the Dental Educational Council of America; now, therefore, be it

RESOLVED: That after January 1, 1926, the graduates of any and all dental schools located in the states which do not admit graduates of dental schools located in the State of Illinois to their examinations for dental licenses, shall not be admitted to the examinations for dental license in the State of Illinois, until such time as the above states shall admit the graduates of all dental schools located in the State of Illinois to their examinations for dental licenses; *provided* that the dental schools located in the State of Illinois remain in Class A or Class B.

In many statutes, retaliatory reservations authorize withdrawal of reciprocal agreements intended to facilitate the admission of practitioners from one state to another. The New York regulations place the interests of the local schools above those of the people of the state. The foregoing resolutions exemplify the same mistake.

INDIANA

Population: 3,048,596. Number of dentists, 1705; physicians, 4251. Ratios: dentists to population, 1: 1788; physicians to population, 1: 717; dentists to physicians, 1: 2.5

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited high school or the equivalent; one year of approved work in an accredited academic college, beginning in 1926-27. Professional training: graduation from a Class A or Class B dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from an accredited medical school

Location of the dental school: Indianapolis; medical school: Bloomington and Indianapolis

INDIANAPOLIS

Population: 354,945. Number of dentists, 333; physicians, 734. Ratios: dentists to population, 1: 1066; physicians to population, 1: 484; dentists to physicians, 1: 2.2

Number of dental clinics or infirmaries, 20; hospitals, sanatoriums, and charitable institutions, 19; hospitals approved for internships, 4

Dental School: Indiana University. *Medical School*: Indiana University

INDIANA DENTAL COLLEGE; School of Dentistry of Indiana University, since June 1, 1925

Special note. An Act of the Indiana State Legislature, approved by the Governor on March 9, 1925, empowered Indiana University to purchase the equipment of the Indiana Dental College and to make the College the School of Dentistry of Indiana University. The equipment was purchased for \$35,000 and transferred to the University on June 1, 1925. The graduates in 1925 received diplomas from Indiana University. Pending further developments, the School will be continued at its present location. The data in this statistical statement pertain almost entirely to the Indiana Dental College, and to the status of the College before its absorption into the University. See the Appendix

Location: Pennsylvania and Walnut Streets, opposite the Indiana Memorial Plaza; six blocks from the centre of the city

General character: independent and proprietary

Organized: in 1879, pursuant to action by the Indiana State Dental Association. During the first two years the College was associated with the Medical College of Indiana, in which the dental students received instruction in anatomy, chemistry, materia medica, and physiology with the medical students

Building: remodeled and annex erected, in 1920; total floor area, 26,322 sq. ft. Occupied by the College as a tenant

Infirmary: with seven accessory rooms; total floor area, 5227 sq. ft. Total number of chairs in active use, 78, including groups reserved for special purposes: crown and bridge work, 11; prosthodontia, 6; extraction, 2; oral surgery, 1

School of Medicine: associated with none. As an integral part of Indiana University, the relation with the University's School of Medicine (Indianapolis) will be intimate

Hospitals in which dental students received accredited instruction in 1924-25: City Hospital (one mile), and James Whitcomb Riley Hospital for Children (ten blocks). Clinical work for the Marion County Orphans Home and the Indianapolis Public School is done in the College Infirmary

Clinical facilities in the Hospitals where dental students received instruction in 1924-25: complete for general surgery; the Riley Hospital is fully equipped for dental service

Number of dental internships and externships, held by officers or students of the School, in the Hospital in 1924-25: none

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: surgical clinics, three hours weekly, for seniors at the City Hospital

Library: room, 608 sq. ft.; no librarian. Contains 638 bound and 480 unbound volumes, and 321 pamphlets (without a card index). Of the volumes, 455 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Indianapolis Public Library (one block); in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: half-time officer; also Professor of Operative Dentistry. *Associate Dean* (or equivalent officer): none. *General Superintendent*: whole-time officer; also Professor of Prosthetic Dentistry. *Business Manager*: part-time officer; representative of the controlling stockholder

Minimum academic requirement for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (16 units), or its equivalent (since 1913)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

Number of graduates (1880-1925): 2062; average per year, for forty-six years, 45

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 270; proportion from Indiana; 1922-23—80 per cent; 1923-24—83 per cent; 1924-25—81 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—4301; 1921-22—7201; 1922-23—9962; 1923-24—9766; 1924-25—10,863

Number of visits: 1920-24—no available data; 1924-25—24,842

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School, 1920-25: none

Rated Class B by the Dental Educational Council of America (June 1, 1925);¹ last previous rating (1918), Class B

FINANCIAL DATA

Estimated value of land and building, \$115,969, and equipment, \$60,205; total, \$176,174 (December 31, 1924). The building is owned by the Dental Realty Company, which pays a ground rental. The equipment is owned by the College, which is owned by the Company. One individual owns most of the stock of the Company

General debt on the School (December 31, 1924): \$64,000 at 7 per cent interest per annum (\$40,000 in preferred stock and \$24,000 in borrowed money)

Par value of outstanding shares (875) of stock (December 31, 1924): \$87,500 (400 shares of preferred, \$40,000; 475 shares of common, \$47,500)

Accumulated net assets (December 31, 1924): \$30,600

	(1)	(2)	(3)	(4)
Data for years ending on December 31	1921	1922	1923	1924
<i>Current income:</i> ²				
Fees (all kinds) paid by the students	\$58,421	\$73,177	\$88,551	\$86,980
Fees paid by patients, in all clinical departments	19,131	24,671	29,645	28,249
Miscellaneous receipts	2,362	623	793	814
Total amount of current income	\$79,914	\$98,471	\$118,989	\$116,043
<i>Total amount of current expenditures</i>	69,978	83,824	94,615	79,599
Net income for the year	\$9,936	\$14,647	\$24,374	\$36,444
<i>Payments to stockholders:</i>				
Interest on preferred stock	\$5,000	\$5,034	\$4,249	\$3,356
Dividend on common stock	None	None	None	None
Total	\$5,000	\$5,034	\$4,249	\$3,356
Net income to surplus	4,936	9,613	20,125	33,088

¹ A new rating had been postponed since July 1, 1923, pending prospective union of the School with Indiana University (page 343).

² During the calendar years 1921-24, there was no appropriation by the State or City, and no income from endowment, investment, or gift; and all miscellaneous receipts are included in the recorded items above.

	(1) 1921	(2) 1922	(3) 1923	(4) 1924
Data for years ending on December 31				
<i>Capital income:</i>				
Net income for the year	\$4,936	\$9,613	\$20,125	\$33,088
Borrowed	20,000	None	None	None
Total	\$24,936	\$9,613	\$20,125	\$33,088
<i>Capital expenditures:</i>				
For reduction in principal of debt	\$20,000	\$6,000	\$7,500	\$15,000
For new equipment	5,582	2,343	997	702
For new construction (no land)	3,412	6,434	None	None
For improvement of the library	None	None	None	None
Total	\$28,994	\$14,777	\$8,497	\$15,702
Deficit	\$4,058	\$5,164	...	...
Surplus	...	...	\$11,628	\$17,386
Average amount expended by the School per student (D.D.S.) per year	272	261	266	222
Average amount of all student fees paid to the School per student (D.D.S.) per year	227	228	249	242
<i>Details of current expenditures:</i>				
Allowance for depreciation	4,894	5,403	5,470	5,474
For interest on debt	6,128	2,731	4,353	92
For rent ¹	3,350	3,750	3,750	2,400
For repairs	273	521	357	99
For research	None	None	None	None
For supplies used in the clinical departments	6,074	7,979	10,433	10,512
For salaries: for administration	9,600	9,600	6,000	9,600
For salaries: for teaching	25,569	27,514	35,188 ²	37,329 ²
For all other purposes	14,090	26,326	29,064	14,093
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(21)	(21)	(26)	(26)
Amount of their salaries as teachers	18,045	19,671	26,294	28,127
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	2,800	2,800	3,000	3,000
Smallest salary paid to a whole-time teacher of a dental subject	1,300	1,300	1,300	2,000
(Number of teachers of academic or medico-dental subjects)	(14)	(16)	(14)	(15)
Amount of their salaries as teachers	7,524	7,843	8,894	9,202
Largest salary paid to a whole-time teacher of an academic or medico-dental subject		(No whole-time teacher of an academic or medico-dental subject)		

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 42. Of this total number, none were whole-time, none half-time, and 15 part-time or occasional teachers of academic or medico-dental subjects; 8 were whole-time, 5 half-time, and 14 part-time or occasional

¹ In 1920 the College agreed to pay, until 1930, an annual rental of \$11,000 to the Dental Realty Company, the owner of the building and of the College, and the lessee of the ground. In 1921, by supplementary agreement for the same period, the annual rental became \$16,000.

² Includes the Dean's salary.

teachers of dental subjects; 14 were "full" professors; 20 were associate or assistant professors; 2 were lecturers by title; all received salaries; 26 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Summer courses in clinical dentistry (July, August, and September): since 1900; attendance: 1922—27; 1923—25; 1924—32; 1925—50

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course; no advanced course for dental practitioners; no dental extension teaching

Research: none in progress in 1924-25; no publication in 1924 or 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: a bureau is maintained for this purpose. Information is obtained through alumni and dental supply houses, and directly from communities interested; and this is referred to students and graduates

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: March, 1922; March and September, 1923; September, 1925

The foregoing data have been verified in detail by the Dean

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	190	166	261	321	370	366
Women	2	2	1	1	1	3
From other countries: chiefly from the Hawaiian Islands and India.....	2	1	2	1	2	3
Negroes	8	8	14	12	12	8
Attendance at the end of the year.....	188	163	257	321	356	359
Admitted after examination.....	3	3	1	0	0	0
Admitted to advanced standing.....	1	2	10	14	24	11
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	3	2	1	1	0	17
Denied further instruction because of deficient scholarship.....	2	4	5	3	8	2
GRADUATES (D.D.S.)						
Total number of graduates.....	90	0	43	50	98	80
Women.....	0	..	0	1	0	0
Admitted to practice in other countries.....	1	..	3	0	1	0
Negroes.....	3	..	1	3	6	2
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	6	..	5	3	7	6
Percentages of failures in such state-board examinations.....	9.6	..	7.1	4.1	0	13.8

SUMMARY

THE conversion of the proprietary Indiana Dental College into an integral part of Indiana University was one of the most significant of the recent developments in dental education. Thorough reorganization, in close coordination with the Medical School and its hospitals, is the most immediate need of the School and is now under way. The Dean and Faculty of the former college have been given an opportunity to achieve this important improvement.

The Dental Educational Council's rating of this School as of June 1, 1925, the date on which the College became a part of the University, was anomalous, especially because a new rating had been deferred since July 1, 1923, pending the School's prospective reorganization, and the degree of success attending the University's endeavors could not have

been predetermined. Therefore, the Council's rating applied neither to the former proprietary college, which, on June 1, 1925, ceased to exist, nor to the new university school, which on that date had not yet been definitely created. Indiana University, having undertaken the serious problem of completely reorganizing the College, deserved the consideration, by suitable postponement of the rating, that was shown by the Council to the University of Cincinnati and to Columbia and New York Universities under similar conditions.

The geographical distribution of the students, in 1924-25, is indicated by the data in the accompanying table, where it may be seen that non-resident students were received chiefly from Illinois and Ohio.

GEOGRAPHICAL DISTRIBUTION OF THE STUDENTS AT THE INDIANA DENTAL COLLEGE: 1924-25

<i>States (17), territory (1), and foreign country (1)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Illinois	8	2	2	7	19
Indiana	75	83	67	73	298
Kentucky	2	1	1	0	4
Michigan	2	4	0	2	8
Ohio	1	4	3	2	10
Pennsylvania	1	1	1	4	7
Tennessee	0	1	1	1	3
West Virginia	1	0	0	4	5
Arkansas, Colorado, Connecticut, Hawaiian Islands, India, Iowa, Maryland, Minnesota, New York, North Dakota, South Dakota— one or two each	7	0	3	3	13
Total	97	96	78	96	367

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of this School who failed, in the number of states indicated by the figures in parenthesis: 1925.—6.4 (6); U. S. schools collectively, 11.3. 1910-25.—8.4 (21); U. S. schools collectively, 14.2.

GENERAL COMMENT

EACH of the four states surrounding Indiana has at least one dental school, the total number being nine—Michigan, 1; Ohio, 4; Kentucky, 1; Illinois, 3. Indiana University is now engaged in the very difficult task of developing a first class school from the former proprietary college. This transformation will be particularly useful to Indiana, for, although the graduates of the College during the past sixteen years (1910-25) have taken their initial license examinations in twenty-one states, approximately 85 per cent of the recent attendance has consisted of prospective Indiana practitioners. The extent of the recent service of the School to the State of Indiana is suggested by

DATA PERTAINING TO THE INDIANA DENTAL COLLEGE: THE DENTAL SCHOOL OF THE UNIVERSITY OF INDIANA: 1920-26

	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Total attendance	261	321	370	366	367	368
Proportion of students resident in Indiana	76	79	80	83	81	87
First-year students	78	99	79	97	103	106
Graduates	43	50	98	80	81	75 ¹
Percentage of graduates who failed in state-board examinations	7.1	4.1	0.0	13.8	6.4	...

¹The number of seniors (December, 1925).

the data in the tables on page 344. During the past four years the total number of students has been practically stationary, although the size of the first-year class has gradually been increasing.

As an integral part of the University, the reorganized School, conducted primarily to promote the welfare of Indiana, and suitably supported by the public and the Legislature, should become one of the best. The effort of the University further to increase the serviceability of its Indianapolis centre for education in health service, by including a dental school, is worthy of the interest of the whole state. At present (December, 1925) there is no indication that the funds required for material improvement of the School have become available for the purpose.

Like most medical schools, that of Indiana University has not given formal attention to odontology, stomatology, or clinical dentistry, although such specialties of health service as those relating to the eye, ear, nose, and throat have the conventional status in the undergraduate curriculum.

IOWA

Population: 2,496,337. Number of dentists, 1684; physicians, 3378. Ratios: dentists to population, 1:1482; physicians to population, 1:739; dentists to physicians, 1:2.0
 Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited high school or academy that requires not less than 15 college entrance units in a four-year curriculum. Professional training: graduation from an accredited dental school having a four-year curriculum. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from an accredited medical school, and one year of interne service in an approved hospital

Location of the dental school: Iowa City; medical school, Iowa City

IOWA CITY

Population: 15,289. Number of dentists, 17; physicians, 50. Ratios: dentists to population, 1:899; physicians to population, 1:306; dentists to physicians, 1:2.9¹

Number of dental clinics or infirmaries, 4; hospitals, sanatoriums, and charitable institutions, 3; hospitals approved for internships, 2

Dental School: State University of Iowa. *Medical School*: State University of Iowa

COLLEGE OF DENTISTRY, STATE UNIVERSITY OF IOWA

Location: on the site of the University, in the centre of the city

General character: integral part of the State University of Iowa

Organized: in 1882. From 1873 to 1882, formal instruction in dentistry, by one teacher, was included in the medical curriculum of the University of Iowa. Pursuant to a suggestion in May, 1881, from the Iowa State Dental Society, the General Assembly voted in April, 1882, to permit the Board of Regents of the University to establish a dental

¹ The statistical data in this paragraph have been presented by Dean Frank T. Breene of the College of Dentistry. The figures for population include university students who are legal residents of Iowa City. The additional transient university population on or about April 1, 1925, was approximately 6000. The figures for each kind of practitioner indicate the number in active practice and exclude those who were associated with the University as whole-time officers.

school, which, having been organized promptly, admitted students in the following October. In 1908 the Keokuk (Iowa) Dental College (1897-1908, the Dental Department of the Keokuk Medical College) was removed to Des Moines and made the Dental Department of Drake University; but, with the discontinuance of that Department in 1913, its students were transferred to the Dental School of the University of Iowa

The Des Moines College of Dental Surgery was organized in 1897 and graduated one student in 1899. Although remaining proprietary, in 1900 it became the Des Moines College of Dental Surgery of Drake University, but was discontinued in 1906. The graduates of this School, from 1900 to 1906, were included, by agreement with Drake University, among the graduates of the College of Dentistry of the University of Iowa

Building: erected in 1917; special improvements were made in 1921; total floor area, 62,000 sq. ft. Distance from the Medical School, three blocks; from the University Hospitals, four blocks

Infirmiry: in the dental building, with twenty-five accessory rooms; total floor area, 14,393 sq. ft. Total number of chairs in active use, 127, including groups reserved for special purposes: prosthodontia, 6; extraction and orthodontia, 4 each; examination, 2

Relation of the School of Medicine (Class A): all of the medico-dental subjects are taught to dental students in separate classes, in the laboratories of the Medical School, by members of the Medical Faculty. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects gave medical students instruction in clinical dentistry

Hospitals in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: University Hospitals (four blocks)

Clinical facilities in the Hospitals where dental students received instruction in 1924-25: complete for all phases of medicine and surgery

Number of dental externships (no internships), held by officers of the School, in the Hospitals in 1924-25: four

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: oral surgery, jaw cases, major operations, application of splints, throat and nose examinations, study and diagnosis of oral lesions, by sectional instruction; to teach oral surgery under the conditions that prevail in a good hospital

Library (dental building): room, 1224 sq. ft.; whole-time librarian. Contains 1700 bound and 300 unbound volumes, and 250 pamphlets (all effectively card indexed). Of the volumes, approximately 1500 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently available to dental students: University and Medical School Libraries; in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: five students; total amount, \$5225, of which none was provided by the School; a portion was received from the U. S. Veterans Bureau

Dean: half-time officer; also Professor of Operative Dentistry. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: whole-time secretary

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: uncertain

Number of graduates (1883-1925): 1754; average per year, for forty-three years, 41. (Number for the Keokuk Dental College, 1899-1908 — 138; average per year, for ten years, 14. Number for the Dental Department of Drake University, 1909-13 — 40; average per year, for five years, 8. Number for the Des Moines College of Dental Surgery of Drake University, 1900-06 — 88; average per year, for seven years, 12)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 251; proportion from Iowa: 1922-23—85 per cent; 1923-24—87 per cent; 1924-25—90 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—4471; 1921-22—5759; 1922-23—6836; 1923-24—5377; 1924-25—5500

Number of operations: 1920-21—18,731; 1921-22—28,191; 1922-23—36,149; 1923-24—31,703; 1924-25—24,186

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-21—1940; 1921-22—2021; 1922-23—2170; 1923-24—1960; 1924-25—1931

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value (dental building) of land and building, \$270,000, and equipment, \$230,000; total, \$500,000 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): none

Data for years ending on June 30	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students ²	\$53,762	\$44,800	\$52,687	\$38,529
Fees paid by patients, in all clinical departments	24,354	30,295	35,277	29,232
University funds, additional to the income designated above:				
(a) Direct appropriation	14,537	51,704	36,225	39,437
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	74,000	68,000	75,000	75,000
Total amount of current income	\$166,653	\$194,799	\$199,189	\$182,198
Total amount of current expenditures	\$166,653	\$194,799	\$199,189	\$182,198
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	88,537	119,704	111,225	114,437
Average amount expended by the School per student (D.D.S.) per year	579	782	743	855
Average amount of all student fees paid to the School per student (D.D.S.) per year	187	180	197	181

Details of expenditures:³

For rent (included also in "Estimated amount of miscellaneous income," above) ⁴	30,000	30,000	30,000	30,000
For repairs	3,000	10,317	14,665	3,000
For new equipment				

¹ During the academic years 1920-24, there was no surplus, no appropriation by the State directly or by the City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

² During the academic years 1920-24, the tuition fees for students who resided outside of Iowa were from \$25 to \$75 greater than for Iowa students; for 1924-25 they were \$75 greater.

³ During the academic years 1920-24, there was no payment on account of debt.

⁴ The total "for rent" includes an estimated amount for the use of laboratories in the Medical School. This item is clerical only, for the School has not been required to pay a rental.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
For new construction (no land)	None	\$2,500	None	None
For research	\$700	1,000	\$1,500	\$2,100
For improvement of the library	750	200	450	500
For supplies used in the clinical departments	19,737	23,067	24,042	20,712
For salaries: for administration	9,616	10,474	10,410	10,190
For salaries: for teaching	79,850	99,393	99,470	91,689
For all other purposes	23,000	17,848	18,652	24,007
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(25)	(28)	(30)	(25)
Amount of their salaries as teachers	58,850	77,393	77,470	70,689
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	4,000	4,500	4,500	4,500
Smallest salary paid to a whole-time teacher of a dental subject	1,500	1,500	1,500	1,500
(Number of teachers of academic or medico-dental subjects)	(21)	(21)	(22)	(19)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	21,000	22,000	22,000	21,000
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	4,000	4,500	4,500	4,500
In the Medical School	5,500	6,500	6,500	8,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	2,000	2,000	2,000	2,000
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	21,000	22,000	22,000	21,000

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 46. Of this total number, none were whole-time, 3 half-time, and 18 part-time or occasional teachers of academic or medico-dental subjects; 22 were whole-time and 2 half-time teachers, and 1 was a part-time or occasional teacher of dental subjects; 22 were whole-time teachers in the Dental School only; 17 were "full" professors; 8 were associate, assistant, or clinical professors; 6 were lecturers by title; all received salaries; 29 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1904; now seven years in length

Advanced courses for dental practitioners: since 1910; attendance: 1921-22—3; 1922-23—none; 1923-24—1; 1924-25—3

Dental extension teaching: a graduate dentist and a dental hygienist have been members of the staff of University Extension since 1922. They organize school clinics, make oral examinations, and give instruction in dietetics and oral hygiene to teachers and nurses in the public schools

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no summer course in clinical dentistry

Research: actively in progress in 1924-25, on the relation of the morphology of the blood to dental focal infection. The School has a newly equipped laboratory for dental research, in the dental building; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service. A location list, kept up to date, is accessible to students and graduates of this and other schools

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	277	294	305	255	283	219
Women.....	1	1	1	0	1	1
From other countries; chiefly from the Hawaiian Islands.....	1	1	3	2	8	8
Negroes.....	2	2	2	3	4	3
Attendance at the end of the year.....	209	260	288	249	268	213
Admitted after examination.....	1	2	0	0	0	0
Admitted to advanced standing.....	0	1	0	1	0	2
From other countries, to advanced standing.....	0	0	0	0	0	1
"Repeaters" of one or more subjects.....	30	24	19	18	17	18
Denied further instruction because of deficient scholarship.....	10	13	10	11	3	4
GRADUATES (D.D.S.)						
Total number of graduates.....	115	8	36	40	104	68
Women.....	0	0	1	0	0	0
Admitted to practice in other countries.....	0	2	1	0	5	0
Negroes.....	1	1	1	1	1	1
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	6	1	2	1	3	1
Percentages of failures in such state-board examinations.....	1.1	0	5.6	0	1.0	4.4

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research, but the Faculty endeavors to gain reliable information on the reasons for discontinuance of practice or for unethical conduct in individual cases; notes the merit of the participants in the annual alumni clinic, at the meetings of dental societies, and in examinations for service in the Army or Navy; and follows the careers of its graduates as teachers in dental schools or as members of state boards of dental examiners

Visited: May, 1922; January, 1923

The foregoing data have been verified in detail by the Dean

SUMMARY

THE School receives encouraging support from the University, and is closely associated with the Medical School and University Hospital. Its educational influence will expand after the inauguration of graduate work and the quickening of interest in research, which may be expected to accompany early prospective developments in medical education at the University that will be supported by funds amounting to \$4,500,000 in gifts from the General Education Board and the Rockefeller Foundation, and in appropriations from the State Legislature. In 1924-25, twenty-five teachers of dental subjects—twenty-two of whom gave whole-time service—received salaries amounting to \$75,735 or a little more than an average of \$3000. This does not seem to be adequate for whole-time teachers of

ability and experience. The item of \$30,000 for rental, among the above financial data, is a suggestion of the Dean's appreciation of the value of a phase of the University's support, not an indication of a rent-charging policy within the University.

The accord with the Medical School and the University Hospital promotes instruction of the dental students in the medical sciences and also in oral surgery, but the Dental School does not provide for thorough presentation of the correlations between clinical dentistry and clinical medicine, despite the fact that the dental curriculum is unusually expensive. For 1925-26 the total number of hours of required work is 5168, including nearly 1500 hours in each of the third and fourth years. A careful pruning of about one-third would favor removal of the redundancies of dental technology and of the excesses of routine clinical practice, would encourage additions to the work in esthetics and oral medicine, and would facilitate desirable reintegration of the entire curriculum. The concept of prevention of dental maladies receives special attention in a 16-hour course in general hygiene in the third year and in a 16-hour course in oral prophylaxis in the fourth year—32 hours in a total of 5168 (0.62 per cent). Despite the over-emphasis on reparative technology (528 hours in the first year alone), neither mechanics nor fine art is mentioned in the curriculum. None of the phases of oral health-service is listed in the published curriculum of the Medical School, but the fourth-year medical students receive clinical instruction in the Department of Ophthalmology, Otolaryngology, and *Oral Surgery* at the University Hospital in "diseases [of the] eye, ear, nose, throat, mouth, and jaws (2 hours)"¹ (Announcement, 1925, p. 400).² The oral surgeons who cooperate in giving this instruction are members of the Medical and Dental Faculties. They are also members of the staff of the University Hospital, where, besides an otolaryngologist and oral surgeon-in-chief, an oral surgeon, and an instructor in ophthalmology, otolaryngology, and oral surgery, there are also five medical internes in ophthalmology, otolaryngology, and oral surgery, and an additional one in otolaryngology and oral surgery. There are no "dental surgeons" on the staff of the Hospital.

The effect, on the attendance, of an increase in the entrance requirement, in one of the first schools to base its curriculum on a year of approved work in an accredited academic college, is shown by the data on page 351. The accompanying data for geographical distribution of the students, in 1924-25, indicate that South Dakota was the only state that contributed more than one non-resident student.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE STATE UNIVERSITY OF

IOWA: 1924-25

<i>States (9), territory (1), and foreign countries (4)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Hawaiian Islands	0	0	3	0	3
India	1	0	1	0	2
Iowa	71	50	51	25	197
South Dakota	1	2	1	3	7
Bulgaria, China, Colorado, Illinois, Java, Minnesota, Missouri, New Mexico, North Dakota, Wisconsin—one each	3	0	6	1	10
Total	76	52	62	29	219

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of this School who failed, in the number of states indicated by the figures in parenthesis: 1925.—8.0 (1); U. S. schools collectively, 11.3. 1910-25 (cumulative).—4.7 (15); U. S. schools collectively, 14.2.

¹ This phrase is remarkable in the literature of American medicine because it contains the words "mouth and jaws" in addition to the exclusive and stereotyped "eye, ear, nose, and throat."

² During 1925-26 this Department was divided into new Departments of Ophthalmology and Head Specialties, and the title of the course mentioned above was changed by the removal of the word "eye."

GENERAL COMMENT

In five of the six bordering states, Minnesota, Wisconsin, Illinois, Missouri, and Nebraska, there are ten dental schools; South Dakota contains none. With the growth of these schools, the proportion of non-resident dental students at the University of Iowa has been decreasing and is now approximately only 10 per cent. Since 1910 graduates of the School have taken their initial license examinations in fifteen states, but during the past decade in only two or three besides Iowa.¹ The service of the School to the State of Iowa, during recent years, is indicated by the data in the accompanying table.

DATA PERTAINING TO THE DENTAL SCHOOL OF THE STATE UNIVERSITY OF IOWA: 1920-26

	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Total attendance	287	247 ²	268	210	219	247
Proportion of students resident in Iowa	83	85 ²	85	87	90	90
First-year students	85	14 ²	72	50	71	66
Graduates	36	40	104	68	28 ²	64 ³
Percentage of graduates who failed in state-board examinations	5.6	0.0	1.0	4.4	8.0	...

The state's active interest in giving its population the best possible dental service, through the agency of improved education of dentists from among its own citizens, ensures adequate support for the Dental School on a plane of scholastic equality with the Medical School in the important health centre in Iowa City. Although the local population is relatively small, the clinical facilities in the Dental Infirmary and in the hospitals are sufficient for the needs of the School. Here, as at Ann Arbor (page 400), patients are received into the Infirmary not only from the resident population and from the large number of students in the University, but also from all portions of the state. Many of the non-resident patients remain in Iowa City for relatively long periods for the proper conduct of thorough treatment. They add to the School's clinical resources an adequate number of the types of cases which, distinguished from those needing only emergency treatment and which may be overabundant in large cities, require the more elaborate measures of oral health-service, including the most difficult restorations. Appreciating the permanent value of this kind of treatment, these patients reserve the requisite time for it, thus affording the student ample opportunity to gain experience in planning and conducting the best and most serviceable practice.

These conditions in this small city have an important bearing on the general belief that, in order to function adequately as a *teaching* clinic, a dental infirmary must be situated in the heart of a large city, even if wide separation from the university of which it is a part is necessitated. Practitioners who give a dental school part-time service usually insist that the infirmary should be located in a business district. Inclined as they are to serve personal convenience in going back and forth between the school and private office, their judgment in advising the location of an infirmary,

¹ Among the reasons for the decrease in the number of non-resident students were the occasional increases in the tuition fee from \$50 in 1914 to \$250 in 1924; the institution, in 1920, of vocational and intelligence tests for admission; and, in 1921, the elevation of the entrance requirement to one year of approved work in an accredited academic college.

² The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

³ The number of seniors (December, 1925).

ability and experience. The item of \$30,000 for rental, among the above financial data, is a suggestion of the Dean's appreciation of the value of a phase of the University's support, not an indication of a rent-charging policy within the University.

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<i>States (9), territory (1), and foreign countries (4)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
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Iowa	71	50	51	25	197
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Bulgaria, China, Colorado, Illinois, Java, Minnesota, Missouri, New Mexico, North Dakota, Wisconsin—one each	3	0	6	1	10
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which has often been decisive, is apt to be seriously impaired by self-interest. The best location for the teaching infirmary of a university dental school is plainly that site which will give the student the greatest *educational* advantages. If the work of an infirmary under such favorable conditions is as good as it should be, its excellence will attract patients from a wide region and will assure the facilities for clinical instruction that the best interests of the students may require. Naturally, however, the greatest range and number of unusual types of cases are encountered in the largest centres of population, but this difference is important chiefly for those who seek training beyond the scope of general practice. It is obvious, also, that where the maximum extent of community health-service is sought, and where the educational relationships of an infirmary should be subordinated thereto, a central location in a populous district affords the broadest opportunity for clinical usefulness.

KANSAS

Population: 1,809,588. Number of dentists, 1050; physicians, 2364. Ratios: dentists to population, 1:1723; physicians to population, 1:765; dentists to physicians, 1:2.3

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a four-year high school or its equivalent. Professional training: graduation from a Class A or Class B dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school

Dental school: none; medical school: University of Kansas

KENTUCKY

Population: 2,481,896. Number of dentists, 782; physicians, 3041. Ratios: dentists to population, 1:3174; physicians to population, 1:816; dentists to physicians, 1:3.9

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a four-year high school or its equivalent. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from an accredited medical school

Location of the dental school: Louisville; medical school: Louisville

LOUISVILLE

Population: 258,862. Number of dentists, 194; physicians, 596. Ratios: dentists to population, 1:1334; physicians to population, 1:434; dentists to physicians, 1:3.1

Number of dental clinics or infirmaries, 2; hospitals, sanatoriums, and charitable institutions, 30; hospitals approved for internships, 3

Dental School: University of Louisville. *Medical School*: University of Louisville

SCHOOL OF DENTISTRY, UNIVERSITY OF LOUISVILLE

Location (dental building): Brook Street and Broadway; five blocks from the centre of the city

General character: integral part of the University of Louisville

Organized: in 1918, when the University purchased the equipment of the Louisville College of Dentistry, which had been established in 1886, as the associated dental department of the Hospital College of Medicine, in Louisville, the affiliated medical department of the Central University of Kentucky, in Richmond. The College of Dentistry occupied a building with the Hospital College of Medicine until 1899, when the College of Dentistry became independent of the Hospital College of Medicine, and was reorganized and housed in a new building of its own, in which the School of Dentistry is now located. Meanwhile, the College of Dentistry continued in affiliation with the Central University of Kentucky, until, as indicated above, it was discontinued and its equipment purchased by the University of Louisville. In 1908, the Hospital College of Medicine was absorbed by the School of Medicine of the University of Louisville

Building: erected in 1900; occupied by the School as a tenant from August, 1918, to June 30, 1923, when it was purchased by the University. Special improvements were made in 1918-19; total floor area, 25,760 sq. ft. Distance from the new site of the University, one and one-half miles; from the Medical School, two blocks

Infirmary: in the dental building, with six accessory rooms; total floor area, 5448 sq. ft. Total number of chairs in active use, 70, including groups reserved for special purposes: oral surgery, 2; demonstration, examination, and roentgenography, 1 each

Relation of the School of Medicine (Class A): some of the medico-dental subjects are taught to dental students in separate classes, in the laboratories of the Medical School, by members of the Medical Faculty. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: Dental Clinic for Public School Children in the Louisville City Hospital (three blocks from the dental building)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: adequate for all aspects of medicine and surgery, and contains three complete units of dental equipment

Number of dental internships (no externships), held by officers of the School, in the Hospital in 1924-25: two

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25. The City Hospital Clinic has been provided for the purpose of caring for school children who are unable to pay for dental service and are brought to the Hospital by school nurses. A whole-time member of the Dental Faculty has charge of this Clinic, and a detail of senior and junior students is sent daily to assist in the Clinic, where they are afforded practice under his instruction. Patients in the Hospital are also treated, either in the Clinic or at the bedside. The students also receive instruction in clinical medicine and surgery

Library (in the dental building): room, 1125 sq. ft.; whole-time librarian. Contains 771 bound and 106 unbound volumes, and 200 pamphlets (all effectively card indexed). Of the volumes, approximately 525 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Libraries of the Medical School and the Jefferson County Medical

Association in one, in the medical building (in active use), Library of the College of Liberal Arts, and the Public Library—all within four blocks of the dental building
Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: part-time officer; also Professor of Special Dental Pathology and Care of Children's Teeth. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: Secretary and Registrar; whole-time officer

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1924)

Next prospective advance in the minimum academic requirement for admission: uncertain
Number of graduates (1919-25): 230; average per year, for seven years, 33. (Number for the Louisville College of Dentistry, 1887-1918—1412; average per year, for thirty-two years, 44)

Average total attendance, per year (at the end of the year), for the past seven years (1919-25): 127; proportion from Kentucky: 1922-23—49 per cent; 1923-24—55 per cent; 1924-25—47 per cent. (Average attendance at the Louisville College of Dentistry, during its last three years, 1916-18—201)

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—3631; 1921-22—4819; 1922-23—5589; 1923-24—3622; 1924-25—4150

Number of operations: 1920-21—10,893; 1921-22—14,457; 1922-23—17,767; 1923-24—10,866; 1924-25—12,450 (the figures are estimates)

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-21—500; 1921-22—1429; 1922-23—1713; 1923-24—2525; 1924-25—2750 (the number for 1920-21 is a close estimate)

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$85,000, and equipment, \$31,053; total, \$116,053 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (July 1, 1925): \$52,733 at 5 per cent interest per annum. The debt was incurred by the purchase of the building on June 30, 1923. The rental for this building was \$5200 a year

Data for years ending on June 30	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
<i>Current income</i> : ¹				
Fees (all kinds) paid by the students	\$25,924	\$33,771	\$38,681	\$44,586
Fees paid by patients, in all clinical departments	11,955	14,869	19,237	19,641
Miscellaneous receipts	None	None	None	2,075
University funds, additional to the income designated above:				
(a) Direct appropriation	4,576	None	None	3,645
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	11,478	10,750	12,700	13,000
Total amount of current income	\$53,933	\$59,390	\$70,618	\$82,947

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

KENTUCKY

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	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Total amount of current income, brought forward	\$53,933	\$59,390	\$70,618	\$82,947
Total amount of current expenditures	\$53,933	\$59,326	\$68,070	\$82,947
Surplus for the year; paid to the University	None	64	2,548	None ¹
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	16,054	10,686	10,152	12,196 ¹
Average amount expended by the School per student (D.D.S.) per year	446	475	486	509
Average amount of all student fees paid to the School per student (D.D.S.) per year	214	270	276	274

Details of expenditures :

For reduction in principal of debt	None	None	None	8,094 ¹
For interest on debt	16	None	None	3,341
For rent	5,200	5,200	5,200	None
For repairs (and alterations)	4,352	972	855	1,401
For new equipment	868	3,012	221	2,370
For new construction (no land)	3,500	None	None	None
For research ²	None	None	945	1,039
For improvement of the library	237	510	479	1,660
For supplies used in the clinical departments	4,943	8,697	7,785	5,504
For salaries : for administration	3,250	3,250	5,131	5,310
For salaries : for teaching	27,960	32,695	38,548	36,966
For all other purposes	3,607	4,990	8,906	17,262

Salaries for instruction :

(Number of teachers of dental subjects)	(22)	(22)	(26)	(27)
Amount of their salaries as teachers	17,018	21,076	27,341	23,006
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	3,000	3,000	3,000	3,000 ³
Smallest salary paid to a whole-time teacher of a dental subject	1,400	1,400	1,400	1,400
(Number of teachers of academic or medico-dental subjects)	(14)	(15)	(15)	(13)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	10,942	11,619	11,207	13,960
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	1,600	1,800	1,700	1,800
In the Medical School	3,500	4,000	4,500	5,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,600	1,800	1,000	1,800
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	6,042	6,969	7,506	13,000

¹ An operation surplus of \$4449, with a direct appropriation of \$3645 of university funds, was used to reduce the principal of the debt by the total of these amounts, as indicated under "Details of expenditures."

² Grants from the Research Commission of the American Dental Association, for the promotion of research at this School (page 160), were paid directly to individuals.

³ In 1924-25, the largest salary paid to a whole-time teacher of a dental subject was \$4000.

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 43. Of this total number, 7 were whole-time, 3 half-time, and 3 part-time or occasional teachers of academic or medicodental subjects; 7 were whole-time, none half-time, and 23 part-time or occasional teachers of dental subjects; 7 were whole-time teachers in the Dental School only; 19 were "full" professors; 7 were associate or assistant professors; 3 were lecturers by title; all received salaries; 17 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1921; now six years in length

Summer courses in clinical dentistry (June and July): since 1924; attendance: 1924-25; 1925-15

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	125	104	136	132	154	181
Women.....	1	0	1	0	0	0
From other countries; chiefly from Holland, Persia, and Greece.....	4	4	4	2	1	1
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	125	91	121	125	140	163
Admitted after examination.....	7	0	5	0	0	0
Admitted to advanced standing.....	4	16	7	5	4	0
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	3	5	5	4	3	2
Denied further instruction because of deficient scholarship.....	2	0	1	2	1	3
GRADUATES (D.D.S.)						
Total number of graduates.....	76	18	21	18	29	28
Women.....	0	0	0	0	0	0
Admitted to practice in other countries.....	0	0	0	0	0	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	15	6	6	6	5	4
Percentages of failures in such state-board examinations.....	8.5	25.0	4.8	15.7	10.3	0

Research: actively in progress in 1924-25, on the histology, development, and metabolism of enamel; comparative dental histology; nature of enamel capillaries; methods of staining enamel; several publications in 1924 and 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: February, 1922; September, 1925

The foregoing data have been verified in detail by the Dean

SUMMARY

SYMPATHETIC coöperation by members of the Medical Faculty, and more stringent enforcement of the published requirements for admission, were important factors in the marked improvement that gave the School its present Class A rating. There is strong appreciation by the Dental Faculty of the significance of dentistry as a mode of health service, and the students receive stimulating instruction and gain useful experience in the City Hospital. The School needs more effectual financial support, improvement in the equipment, and betterment of the teaching, to justify continuance of its Class A rating. The requirements of good teaching cannot be met by the present expenditures for salaries for instruction. Although the Faculty restricts its teaching to the undergraduate curriculum, research has recently been given special attention by several of its members with the support of grants from the Research Commission of the American Dental Association (page 160). The value of the School to the state, in recent years, may be inferred from the data in the accompanying table. The effect on the attendance of an entrance requirement of one year of approved work in an accredited academic college, beginning in 1924-25, is indicated by the figures for the number of students in the classes during the past three years. There was an increase in the number of first-year students in 1925-26, after the

CLASSIFICATION OF THE TOTAL ATTENDANCE AT THE DENTAL SCHOOL OF THE UNIVERSITY OF LOUISVILLE: 1922-26

	Percentage resident in Kentucky	First year	Second year	Third year	Fourth year	Total	Graduates
1922-23	49	40	40	32	28	140	29
1923-24	55	53	42	38	30	163	28
1924-25	47	5 ¹	49	33	40	127	40
1925-26	44	17	8 ¹	46	33	104	..

sharp decrease in 1924-25, despite the fact that graduation from a high school continued to be the minimum academic requirement for admission to five schools in adjacent states.

The Dental Clinic in the Louisville City Hospital, which is maintained by the Dental School, is associated on the fourth floor with the medical laboratories for blood chemistry, basal metabolism, electro-cardiographic work, and with a few beds devoted to medical research. Despite these favorable affiliations, however, the medical students, as at most medical schools, do not receive formal instruction in clinical dentistry or stomatology, although various other specialties of health service are given attention in short courses in the third and fourth years. More active coöperation between the Medical and Dental Faculties would promote the interests of both the medical and dental students. No one who teaches a dental subject is a member of the Medical Faculty. The "Professor of Special Dental Biology and of Research" in the Dental School is a physician and also a dentist, but he is not an instructor of medical students in any phase of dental physiology or of oral pathology.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of this School who failed, in the number of states indicated by the figures in parenthesis: 1925.—10.0 (6); U. S. schools collectively, 11.3. 1919-25 (cumulative).—9.5 (?); U. S. schools collectively, 12.8.

GENERAL COMMENT

THE seven states bordering on Kentucky contain fifteen dental schools—Illinois, 3; Indiana, 1; Ohio, 4; West Virginia, 0; Virginia, 1; Tennessee, 3; Missouri, 3. No other

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

state is the centre of a similar congestion. Nevertheless, a considerable number of students from other states have attended the present Louisville school or its predecessor, although this condition did not always signify appreciation of educational excellence. Since 1910, graduates of the Louisville schools have taken their first license examinations in thirty states, but during recent years in only about ten states. The geographical distribution of the students, in 1924-25, is indicated by the data in the accompanying table, where it will be seen that the states chiefly represented, besides Kentucky, were Indiana, Ohio, West Virginia, and Tennessee. The further development of the dental schools in the state universities of Indiana, Ohio, and Tennessee will tend to reduce the attendance at Louisville from these states. Although West

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY
OF LOUISVILLE: 1924-25

States (19)	First year	Second year	Third year	Fourth year	Total
Indiana	0	7	3	5	15
Kentucky	1	20	17	21	59
Ohio	1	4	2	4	11
Tennessee	1	4	2	0	7
West Virginia	1	6	2	2	11
Alabama, Connecticut, Louisiana, Missouri, New York, North Dakota, Oklahoma, Texas, —one each	1	4	0	3	8
Illinois, Mississippi, Virginia—two each	0	1	3	2	6
Massachusetts, North Carolina, Pennsylvania —three or four each	0	3	4	3	10
Total	5	49	33	40	127

Virginia does not contain a dental school, those in Ohio, Pennsylvania, Maryland, District of Columbia, and Virginia will probably not be ignored by West Virginians seeking the best school in which to obtain their professional training. The continued improvement of the only dental school in Kentucky, for which additional funds are required, and the steady growth of the University of which it is a part and also of the Medical School with which it is associated, promise to make the University of Louisville the main factor in the training of Kentucky dentists, and an important centre of dental education in the South.

LOUISIANA

Population: 1,871,705. Number of dentists, 668; physicians, 1991. Ratios: dentists to population, 1: 2802; physicians to population, 1: 940; dentists to physicians, 1: 3.0

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a high school or its equivalent. Professional training: graduation from a dental school recognized by the National Association of Dental Examiners. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from an accredited medical school

Location of the dental schools (2): New Orleans; medical school: New Orleans

NEW ORLEANS

Population: 412,014. Number of dentists, 263; physicians, 651. Ratios: dentists to population, 1 : 1567; physicians to population, 1 : 633; dentists to physicians, 1 : 2.5
 Number of dental clinics or infirmaries, 10; hospitals, sanatoriums, and charitable institutions, 25; hospitals approved for internships, 4

Dental Schools: (1) Tulane University of Louisiana; (2) Loyola University. *Medical School*: Tulane University

(1) SCHOOL OF DENTISTRY, COLLEGE OF MEDICINE, TULANE UNIVERSITY OF LOUISIANA

Location (clinical building, Josephine Hutchinson Memorial Building): 1551 Canal Street; at the centre of the city

General character: integral part of Tulane University

Organized: in 1909, by absorption of the New Orleans College of Dentistry (1899-1909)

Buildings: during the first and second years, the instruction is given in buildings (academic and medical) on the Tulane campus; floor area reserved for the Dental School in Richardson Memorial Building (medical): 2000 sq. ft. During the third and fourth years, the instruction is given entirely in the Josephine Hutchinson Memorial Building and in the Charity Hospital. The Hutchinson Memorial Building is situated five miles from the Tulane campus; the Charity Hospital, two squares from the Hutchinson Memorial Building. The latter, also used by the Schools of Medicine and Pharmacy, was erected in 1892; floor area reserved in it for the Dental School: 6277 sq. ft. Total floor area reserved for the Dental School, 8277 sq. ft.

Infirmery: in the Hutchinson Memorial Building, with seven accessory rooms; total floor area, 3851 sq. ft. Total number of chairs in active use, 35, including groups reserved for special purposes: extraction, 2; roentgenography, 1

Relation of the School of Medicine (Class A): all of the medico-dental subjects are taught to dental students in separate classes, in the laboratories of the Medical School, by members of the Medical Faculty. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction in 1924-25: Charity Hospital (two blocks from the Dental Infirmery)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for medicine and surgery

Number of dental internships or externships, held by officers or students of the School, in the Hospital in 1924-25: none

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: principles and practice of general and oral surgery, and physical diagnosis; to teach modern dentistry under the conditions that prevail in a good hospital

Library (Hutchinson Memorial Building; primarily medical): room, 3000 sq. ft.; whole-time librarian. Contains 12,500 bound and 400 unbound volumes, and 4500 pamphlets (all effectively card indexed). Of the volumes, approximately 300 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible

to dental students: University Library and the libraries of the medical departments in the Richardson Memorial Building on the Tulane campus; in active use
Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: half-time officer; also Professor of Dental Pathology and Therapeutics. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: whole-time secretary

Minimum academic requirement for admission to the first-year class, in September, 1924: graduation from an accredited four-year high school or academy, with 15 acceptable units or its equivalent (since 1915)

Latest advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1925

Number of graduates (1910-25): 337; average per year, for sixteen years, 21. (Number for the New Orleans College of Dentistry, 1900-09—189; average per year, for ten years, 19)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 90; proportion from Louisiana: 1922-23—41 per cent; 1923-24—52 per cent; 1924-25—45 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—1078; 1921-22—4017; 1922-23—9605; 1923-24—12,579; 1924-25—12,743

Number of visits: 1920-21—1634; 1921-22—5651; 1922-23—12,815; 1923-24—17,737; 1924-25—18,229 (the figures are estimates)

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-25—none

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value of the equipment of the Dental School (September 30, 1925): \$21,807. See "Buildings," above. The total value of the buildings in which the work of the School is conducted is approximately \$925,000

General debt on the School, or carried by the University on the School's account (September 30, 1925): none

	(1)	(2)	(3)	(4)
Data for years ending on September 30	1920-21	1921-22	1922-23	1923-24
<i>Current income</i> : ¹				
Fees (all kinds) paid by the students	\$18,864	\$31,119	\$24,737	\$21,460
Fees paid by patients, in all clinical departments	4,285	7,071	15,011	16,852
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	None	2,038
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the budget	23,560	21,085	21,796	19,274
Total amount of current income	\$46,709	\$59,275	\$61,544	\$59,624
<i>Total amount of current expenditures</i>	\$41,849	\$44,921	\$53,723	\$57,572
Surplus for the year	4,860	14,354	7,821	2,052

¹ During the academic years 1920-24, no surplus was used as current income; there was no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on September 30				
Surplus paid to the University, and applied to removal of the accumulated deficit or held to the School's credit ¹	\$4,860	\$14,354	\$7,821	\$2,052
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	18,701	6,730	13,975	17,222
Average amount expended by the School per student (D.D.S.) per year	418	290	413	514
Average amount of all student fees paid to the School per student (D.D.S.) per year	189	201	190	192
<i>Details of expenditures:</i> ²				
For interest on debt ¹	1,010	868	None	None
For repairs	None	None	None	None
For new equipment	1,074	2,434	3,921	5,030
For research	None	None	None	None
For improvement of the library	18	78	91	162
For supplies used in the clinical departments	1,823	3,573	6,977	7,708
For salaries: for administration	2,389	3,374	4,976	4,121
For salaries: for teaching	32,045	33,640	33,650	36,700
For all other purposes	3,490	954	4,108	3,851
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(28)	(23)	(14)	(17)
Amount of their salaries as teachers	6,245	7,840	7,850	10,900
Number of teachers of dental subjects who did not receive salaries	(19)	(11)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	2,040	2,040	None	None
Smallest salary paid to a whole-time teacher of a dental subject	2,040	2,040	None	None
(Number of teachers of academic or medico-dental subjects)	(22)	(27)	(28)	(26)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	25,800	25,800	25,800	25,800
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	None	None	None	None
In the Medical School	5,000	6,500	6,500	6,500
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,200	1,500	1,800	1,800
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	23,560	21,085	21,796	19,274

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 49. Of this total number, none were whole-time, 1 was a half-time, and 29 were part-time or occasional teachers of academic

¹ The accumulated deficit and debt, on September 30, 1920, was \$28,075.

² During the academic years 1920-24, there was no payment for rent, new construction, or land.

or medico-dental subjects; none were whole-time, 5 half-time, and 14 part-time or occasional teachers of dental subjects; there were no whole-time teachers in the Dental School only; 17 were "full" professors; 8 were associate or assistant professors; none were lecturers by title; 17 received no salaries; 27 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Summer courses in clinical dentistry (June, July, August, and September): since 1921; attendance: 1922—20; 1923—25; 1924—18; 1925—17

No combined curricula leading to the degrees of B.S. or B.A. and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

STUDENTS AND GRADUATES: SCHOOL OF DENTISTRY, COLLEGE OF MEDICINE, TULANE UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	60	67	106	168	188	114
Women.....	2	1	2	4	3	3
From other countries; chiefly from Central America, Mexico, and Cuba.....	6	8	12	7	6	1
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	60	68	100	155	180	112
Admitted after examination.....	0	0	2	0	0	0
Admitted to advanced standing.....	17	7	8	32	4	1
From other countries, to advanced standing.....	0	0	0	1	0	0
"Repeaters" of one or more subjects.....	11	7	20	30	31	8
Denied further instruction because of deficient scholarship.....	0	0	2	2	6	1
GRADUATES (D.D.S.)						
Total number of graduates.....	34	4	17	21	29	30
Women.....	1	0	0	1	2	0
Admitted to practice in other countries.....	2	1	4	2	4	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	6	1	3	5	5	1
Percentages of failures in such state-board examinations.....	3.8	0	0	16.6	3.8	0

Research: none in progress in 1924-25; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: November, 1921

The foregoing data have been verified in detail by the Dean

SUMMARY

REORGANIZATION of the administration of this School in 1922-23, more sympathetic cooperation by members of the Medical Faculty, and more effective enforcement of the published admission requirements, have greatly improved the quality of the School, but it lacks strength in the clinical work, particularly in the correlations between clinical medicine and clinical dentistry. In the effort to make the School self-supporting, salaries have been kept very low. There are no whole-time teachers of dental subjects, research has been neglected, and the attention of the Faculty has been confined to the undergraduate curric-

ulum. The dental section of the library is very small. The weakness of the School is emphasized by the fact that the present entrance requirement of one year of approved work in an accredited academic college, first enforced in 1925-26, eliminated the first-year class (page 368). The University desires to raise the School to the high character of its excellent Medical School, but has not been able to give dental education the support it deserves, and will be unable to do so without large additions to its financial resources for the purpose.

Here, as in many other universities, important gifts have been received for the support of medicine but, unfortunately for the Dental School, the use of the funds has been restricted to the advancement of medicine in the narrower sense, which excludes oral health-service. The medical curriculum contains the conventional specialties, but neither stomatology nor oral surgery is listed, and clinical dentistry is ignored. Informal allusions to oral surgery are included in the required work in surgery. In the main, instruction in oral health-service is neglected in this Medical School and in most of the others in North America.

Comparative data relating to students, graduates, and results of license examinations, are given on page 368. The accompanying data for geographical distribution of the students, in 1924-25, indicate that the School has been receiving its students chiefly from Louisiana, Mississippi, and Texas.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT TULANE UNIVERSITY: 1924-25

<i>States (13), territory (1), and foreign countries (2)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Alabama	1	1	1	4	7
Arkansas	0	2	1	1	4
Louisiana	13	19	6	12	50
Mississippi	7	4	1	11	23
Texas	4	0	3	5	12
Idaho, India, Panama Canal Zone, Pennsylvania, Siam, South Carolina, West Virginia — one each	4	0	0	3	7
Florida, Georgia, New Jersey, Tennessee — two or three each	2	3	2	2	9
Total	31	29	14	38	112

(2) SCHOOL OF DENTISTRY, LOYOLA UNIVERSITY

Location: on the site of the University, three miles from the centre of the city

General character: integral part of Loyola University

Organized: in 1914

Building: Bobet Hall, erected during 1923-24. The second of the four floors is now used for the instruction of juniors and seniors in dental technology and clinical dentistry; total area of the floor, 13,000 sq. ft. The academic and medico-dental subjects are taught in the University laboratories in this building and in Marquette Hall (adjacent)

Infirmary: in Bobet Hall, with five accessory rooms; total floor area, 3938 sq. ft. Total number of chairs in active use, 34, including groups reserved for special purposes: prosthodontia, 2; oral surgery, 2

School of Medicine: associated with none. An associated Post-Graduate School of Medicine was discontinued in May, 1925

Hospital in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: Charity Hospital (three miles from the dental building)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for general surgery; a large out-patient dental clinic, equipped by the State, is served by Loyola oral surgeons assisted by senior students

Number of dental internships (1) and externships (3), held by officers of the School, in the Hospital in 1924-25: four

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: oral surgery, practical exodontia, and physical diagnosis; to teach these aspects of oral health-service under the conditions that prevail in a good hospital

Library (for dental students; Bobet Hall): room, 1008 sq. ft.; part-time librarian. Contains 1625 bound and no unbound volumes, and 200 pamphlets (all effectively card indexed). All of the volumes relate to dental subjects

Library facilities additional to those in Bobet Hall that are conveniently accessible to dental students: University Library.

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: part-time officer; also Professor of Clinical Dentistry. *Regent*: whole-time officer in the University; also Professor of Economics in the University

Minimum academic requirement for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (15 units) or its equivalent (since 1916)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

Number of graduates (1915-25): 95; average per year, for eleven years, 9

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 45; proportion from Louisiana: 1922-23 — 66 per cent; 1923-24 — 73 per cent; 1924-25 — 77 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21 — 718; 1921-22 — 775; 1922-23 — 800; 1923-24 — 1200; 1924-25 — 1323

Number of visits: 1920-21 — 10,500; 1921-22 — 12,000; 1922-23 — 12,500; 1923-24 — 18,000; 1924-25 — 10,590 (the figures are estimates)

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-21 — 800; 1921-22 — 1100; 1922-23 — 1200; 1923-24 — 1295; 1924-25 — 1287

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value of land and building (Bobet Hall), \$500,000, and equipment devoted directly to dental education, \$50,000; total, \$550,000 (September 1, 1925)

General debt on the School, or carried by the University on the School's account (September 1, 1925): none

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income</i> : ¹				
Surplus used during the year	None	None	None	\$666
Fees (all kinds) paid by the students	\$5,975	\$9,958	\$10,114	13,638
Fees paid by patients, in all clinical departments	3,129	5,297	5,189	4,225
Gifts	7,000	7,000	8,000	11,000
<i>Carried forward</i>	\$16,104	\$22,255	\$23,303	\$29,529

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment; no money was borrowed; and there were no miscellaneous receipts.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income, brought forward</i> ¹	\$16,104	\$22,255	\$23,303	\$29,529
University funds, additional to the income designated above :				
(a) Direct appropriation	None	None	None	None
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	5,000	8,000	10,000	10,000
Total amount of current income	\$21,104	\$30,255	\$33,303	\$39,529
<i>Total amount of current expenditures</i>	\$21,147	\$28,224	\$31,267	\$34,207
Surplus for the year	...	2,031	2,036	5,322
Deficit for the year	43	...	...	...
Accumulated surplus ²	None	None	1,024	6,346
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	5,043	5,969	7,964	4,678
Average amount expended by the School per student (D.D.S.) per year	557	576	638	622
Average amount of all student fees paid to the School per student (D.D.S.) per year	157	203	206	248
<i>Details of expenditures:</i> ³				
For repairs	100	150	110	100
For new equipment	43	530	120	900
For research	None	None	None	None
For improvement of the library	50	100	100	150
For supplies used in the clinical departments	1,373	2,309	2,087	1,537
For salaries : for administration	1,530	1,550	1,650	1,650
For salaries : for teaching	7,051	9,585	10,200	12,870
For all other purposes ⁴	11,000	14,000	17,000	17,000
<i>Salaries for instruction :</i>				
(Number of teachers of dental subjects)	(18)	(18)	(18)	(18)
Amount of their salaries as teachers	5,051	7,345	6,960	7,870
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary) ⁵	1,800	1,800	1,800	2,000
Smallest salary paid to a whole-time teacher of a dental subject ⁵	1,800	1,800	1,800	2,000
(Number of teachers of academic or medico-dental subjects)	(14)	(14)	(14)	(14)
Amount of their salaries as teachers (including a proper allotment of university salaries for the instruction of dental students)	2,000	2,240	3,240	5,000
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	1,800	1,800	1,800	2,500

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment; no money was borrowed; and there were no miscellaneous receipts.

² Accumulated to the credit of the "Equipment Fund," which was \$5680 on September 1, 1925.

³ During the academic years 1920-24, there was no payment on account of debt, rent, new construction, or land, Bobet Hall, built during 1923-24 and costing \$350,000, having been financed by the University from general funds.

⁴ See "Gifts," above, and "Salary value of the teaching by Jesuits," etc., on page 366.

⁵ There were no whole-time teachers of dental subjects in 1924-25.

DENTAL SCHOOLS IN THE UNITED STATES

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	\$1,500	\$1,800	\$1,800	\$1,800
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University (the "allotment" referred to above)	1,000	1,000	2,000	3,000
Salary value of the teaching by Jesuits without expense to the School (included in "Gifts" and "Total expenditures," above)	6,000	6,000	7,000	7,000

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 32. Of this total number, 6 were whole-time, 6 half-time, and 4 part-time or occasional teachers of academic or medico-dental subjects; none were whole-time, 4 half-time, and 12 part-time teachers of dental subjects; 4 taught both general types of subjects; no whole-time teacher in the Dental School only; 21 were "full" professors; 6 were associate professors; none were lecturers by title; 15 received no salaries; 13 were teachers with degrees other than, or additional to, D.D.S. or D.M.D.

STUDENTS AND GRADUATES: SCHOOL OF DENTISTRY, LOYOLA UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	44	33	39	49	49	55
Women.....	1	2	2	3	2	1
From other countries: chiefly from Latin America, Cuba, and Mexico.....	4	3	6	6	3	6
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	32	32	38	49	49	55
Admitted after examination.....	0	0	0	3	0	0
Admitted to advanced standing.....	0	0	0	0	2	4
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	2	2	1	0	2	2
Denied further instruction because of deficient scholarship.....	1	1	0	2	0	1
GRADUATES (D.D.S.)						
Total number of graduates.....	16	3	3	10	8	13
Women.....	0	0	0	1	1	0
Admitted to practice in other countries.....	2	0	1	0	0	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	1	1	1	2	1	3
Percentages of failures in such state-board examinations.....	0	0	0	0	0	9.1

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1922; now seven years in length

Summer courses in clinical dentistry (June and September): since 1918; attendance: 1921 — 6; 1922 — 9; 1923 — 8; 1924 — 10; 1925 — 17

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: actively in progress in 1924-25, on correlations between the composition of the blood and the progress of infectious or malignant lesions of the mouth; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in commu-

nities particularly in need of dental service, although graduates are encouraged to return to their home towns

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: November, 1921

The foregoing data have been verified in detail by the Regent

SUMMARY

THIS School, lacking association with a medical school, is weak in the integration of the medico-dental sciences with the clinical instruction and in the correlation of clinical dentistry with clinical medicine, and is urgently in need of funds to enable it to promote effectually its public purpose. In the academic and scientific aspects of the instruction the School is stronger, the new science building and equipment having greatly improved its facilities. In 1920-21 the School paid \$5051 in salaries to eighteen teachers of dental subjects; in 1924-25 sixteen teachers of dental subjects received only \$6606. In 1924-25 none of the instruction in the dental subjects was given by whole-time teachers. Graduate instruction has not been attempted, and interest in dental research is weak. Notwithstanding the need for better teaching conditions in the technical and clinical subjects, the School has been conducted at an annual profit, which is now being accumulated as an "equipment fund." Comparative data relating to students, graduates, and results of license examinations, are given on page 368. The accompanying data for geographical distribution of the students, in 1924-25, indicate that recently they have been drawn almost entirely from Louisiana.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT LOYOLA UNIVERSITY: 1924-25

<i>States (8) and foreign countries (3)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Alabama	0	0	1	1	2
Illinois	0	0	0	2	2
Louisiana	15	14	8	11	48
New York	0	0	2	0	2
Texas	1	0	1	0	2
Cuba, Japan, Mexico, Mississippi, New Mexico, Tennessee — one each	2	1	0	3	6
Totals	18	15	12	17	62

GENERAL COMMENT

OF the three surrounding states, Arkansas and Mississippi are without a dental school, but Texas contains two. Missouri and Tennessee, adjacent to Arkansas and Mississippi, support six dental schools. Although Oklahoma, Arkansas, Mississippi, and Alabama do not contain a dental school, those of Louisiana are training very few dentists for service in these neighboring states (page 363). The data in the table on page 368 show that, since 1921-22, the attendance has been increasing at Loyola, but decreasing at Tulane, and that the combined attendance at the two schools has been falling annually. The decline in the attendance at Tulane, during the past four years, has been due to more sincere enforcement of its published entrance requirement and also, in 1925-26, to the elevation of that requirement to a minimum of one year of approved

work in an accredited academic college.¹ One good dental school in New Orleans would probably be able to discharge all of the responsibilities now met by the two. Their union in a school that would be stronger than either, under the most favorable conditions for its development in intimate association with a medical school, hospital, and dispensary, with adequate financial support, would greatly improve oral health-service in New Orleans and notably advance dental education in the South. The unification of all dental interests to this end should appeal strongly to the profession in New Orleans and to the citizens of Louisiana as well. There is only one medical school in Louisiana and at present no urgent public need for another. The recent discontinuance of the Post-Graduate School of Medicine, which had been affiliated with Loyola University, adds pertinence to these views.

DATA PERTAINING TO THE DENTAL SCHOOLS IN THE
STATE OF LOUISIANA: 1919-26

	<i>Total attendance</i>						
	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Tulane	63	100	155	130	112	105	62 ²
Loyola	32	38	49	49	55	61	86
Total	95	138	204	179	167	166	148

	<i>Proportion of students resident in Louisiana</i>						
Tulane	54	43	41	41	52	45	58
Loyola	77	73	70	66	73	77	63

	<i>Number of graduates</i>						
Tulane	4	17	21	29	30	37	14 ³
Loyola	3	3	10	8	12	17	19 ³
Total	7	20	31	37	42	54	33

Classification of the total attendance

	First year	Second year	Third year	Fourth year	Total
Tulane: 1923-24	30	14	38	30	112
1924-25	29	25	14	37	105
1925-26	0 ³	23	25	14	62
Loyola: 1923-24	16	9	17	13	55
1924-25	17	15	12	17	61
1925-26	32	18	17	19	86

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the Louisiana schools who failed, in the number of states indicated by the figures in parenthesis:

1925.—Loyola, 0.0 (3); Tulane, 2.8 (3); U. S. schools collectively, 11.3.

1910-25 (cumulative).—Loyola, 1.3 (6);⁴ Tulane, 6.7 (12); U. S. schools collectively, 14.2.

¹ Tulane required one year of approved work in an accredited academic college for admission, beginning in 1925-26, and had no first-year students—a loss of 29 compared with 1924-25. Loyola continued to base the dental curriculum on graduation from a high school and had 32 first-year students—a gain of 15 compared with 1924-25.

² The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

³ The number of seniors (December, 1925).

⁴ For 1915-25: a total of 95 graduates in eleven years.

MAINE

Population: 781,220. Number of dentists, 502; physicians, 1037. Ratios: dentists to population, 1:1556; physicians to population, 1:753; dentists to physicians, 1:2.1

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a high school in the state or its equivalent. Professional training: graduation from an accredited dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A or Class B medical school

Dental school: none; medical school: none

MARYLAND

Population: 1,529,137. Number of dentists, 727; physicians, 2313. Ratios: dentists to population, 1:2103; physicians to population, 1:661; dentists to physicians, 1:3.2

Statutory requirements. *Dentistry*.—Preliminary education: none. Professional training: graduation from a dental school "recognized" by the Dental Educational Council of America. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a class A or class B medical school

Location of the dental school: Baltimore; medical schools (2): Baltimore

BALTIMORE

Population: 790,617. Number of dentists, 523; physicians, 1468. Ratios: dentists to population, 1:1511; physicians to population, 1:539; dentists to physicians, 1:2.8

Number of dental clinics or infirmaries, 3; hospitals, sanatoriums, and charitable institutions, 42; hospitals approved for internships, 12

Dental School: University of Maryland. *Medical Schools* (2): Johns Hopkins University, and University of Maryland

UNIVERSITY OF MARYLAND SCHOOL OF DENTISTRY AND BALTIMORE COLLEGE OF DENTAL SURGERY¹

Location: Greene and Lombard Streets; one-half mile from the centre of the city

General character: integral part of the University of Maryland. The Schools of Medicine, Law, Dentistry, Pharmacy, and Commerce of the University of Maryland (reorganized in 1920) are situated in Baltimore; the remaining Schools and Departments of the University are located at College Park, twenty-eight miles from Baltimore

Organized: in 1920, by absorption of the affiliated (proprietary) Dental Department, which had been established in 1882. In 1913 the Dental Department (1895-1913) of the Baltimore Medical College (1881-1913) was united with it; and in 1923 the School absorbed the Baltimore College of Dental Surgery (1840-1923), the original Dental School,¹ with which, in 1879, the Maryland Dental College (1873-79) had been amalgamated

¹ The new name of the School appeared on all of the dental diplomas issued by the University of Maryland in 1924 and 1925. It perpetuates the name of the original Dental School, which was founded in 1840 after an unsuccessful effort to establish a dental department in the University of Maryland. (See page 39.)

Buildings: three. The main building was erected in 1904; special improvements were made in 1920 and 1925; it also contains laboratories for the Schools of Medicine and Pharmacy; floor area used for the instruction of dental students, 18,649 sq. ft. A second building (adjoining church) was purchased and remodeled in 1922; it also contains laboratories for the School of Pharmacy; floor area used for the instruction of dental students, 3000 sq. ft. The main medical building is adjacent to these two buildings. The technical and clinical courses for the two groups of students from the Baltimore College of Dental Surgery now in the School (members of the junior and senior classes) are given in the building of the older College, at 851 North Howard Street (one and one-fourth miles); which has been rented until 1926 for this purpose. This building was erected in 1908; special improvements were made in 1914; floor area used for the instruction of these students, 13,289 sq. ft. Laboratory instruction in gross anatomy is given at Mercy Hospital (one mile), where the floor area reserved for the purpose is 820 sq. ft. Total floor area used by the School in its three buildings and at Mercy Hospital, 35,758 sq. ft.

Infirmiry (first): in the main dental building, with nine accessory rooms; total floor area, 6960 sq. ft. Total number of chairs in active use, 96, including groups reserved for special purposes: crown and bridge work and special dental pathology, 10 each; prosthodontia, 9; extraction, 4; roentgenography, 1

Infirmiry (second): in the Howard Street building (see "Buildings," above), with two accessory rooms; total floor area, 2364 sq. ft. Total number of chairs in active use, 35, including groups reserved for special purposes: prosthodontia and extraction, 2 each; roentgenography, 1. (This Infirmiry will be discontinued after 1925-26)

Relation of the School of Medicine (Class A): the medico-dental subjects are taught to dental students in separate classes, in the laboratories of the Medical School, by members of the Dental Faculty. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospitals in which dental students received optional instruction in 1924-25: Maryland General Hospital (one and one-fourth miles), Mercy Hospital (one mile), and the University Hospital (two blocks)

Clinical facilities in the Hospitals where dental students received optional instruction in 1924-25: complete for all phases of medicine and surgery; special facilities for extractions and treatment

Number of dental externeships (no interneships), held by officers of the School, in the Hospitals in 1924-25: three

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: operations of the face and oral cavity (Maryland General), extractions and treatment (University), and anatomy and post-mortems (Mercy); to teach oral surgery and the correlations between oral and systemic conditions of disease

Library (in the main dental building): none

Library facilities near the dental building that are accessible to dental students: University Library in Davidge Hall (diagonally across the street; primarily medical—1000 dental volumes in a total of nearly 19,000) and the Library of the Medical and Chirurgical Faculty of Maryland (one and one-half miles)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: six students; total amount, \$1050, of which none was provided by the School

Dean: half-time officer; also Professor of Dental Anatomy and Operative Technics. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: whole-time secretary

Minimum academic requirement for admission to the first-year class, in September, 1924:

graduation from an accredited high school or academy (15 units), or its equivalent (since 1914)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

The School will lengthen its curriculum to five years, the first of which, devoted mainly to academic subjects under the "direct supervision and control" of the Academic College, will include two technical courses (technical drawing and dental anatomy). Students who have completed the equivalent of one year of approved work in an accredited academic college will be admitted to the second year of the five-year curriculum

Number of graduates (1921-25): 321; average per year, for five years, 64. (Number for the affiliated School during the proprietary era, 1883-1920—1976; average per year, for thirty-eight years, 52. Number for the Baltimore College of Dental Surgery, 1841-1923—3088; average per year, for eighty-three years, 37. Number for the Maryland Dental College, 1874-78—51; average per year, for five years, 10. Number for the Dental Department of the Baltimore Medical College, 1896-1913—357; average per year, for eighteen years, 19)

Average total attendance, per year (at the end of the year), for the past ten years, including five years of the period of affiliation (1916-25): 231; proportion from Maryland: 1922-23—11 per cent; 1923-24—17 per cent; 1924-25—17 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—6786; 1921-22—8850; 1922-23—11,048.

In both infirmaries after the absorption of the Baltimore College of Dental Surgery: 1923-24—18,500; 1924-25—18,100

Number of visits, sittings, or operations: 1920-25—no available data

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-25—none; optional observations of operations only

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value (Dental School) of land and buildings, \$125,000, and equipment, \$60,298; total, \$185,298 (June 30, 1925). All of this property is owned by the University

General debt on the School, or carried by the University on the School's account (June 30, 1925): \$7500 at 6 per cent interest per annum

	(1)	(2)	(3)	(4)
Data for years ending on September 30	1920-21	1921-22	1922-23	1923-24 ¹
<i>Current income:</i> ²				
Appropriated by the State	None	None	\$3,150	None
Fees (all kinds) paid by the students	\$28,244	\$42,362	53,015	\$126,995
Fees paid by patients, in all clinical departments	10,002	12,210	14,436	34,790
Gifts	2,340	None	None	None
Borrowed during the year	9,848	5,672	16,000	None
Miscellaneous receipts	317	225	151	1,028
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	4,100	4,100
<i>Carried forward</i>	\$50,751	\$60,469	\$90,852	\$166,913

¹ The Baltimore College of Dental Surgery was united with the School on June 15, 1923.

² During the academic years 1920-24, there was no appropriation by the City, and no income from endowment; and all miscellaneous receipts are included in the recorded items above.

DENTAL SCHOOLS IN THE UNITED STATES

	(1)	(2)	(3)	(4)
Data for years ending on September 30	1920-21	1921-22	1922-23	1923-24 ¹
<i>Current income, brought forward</i>	\$50,751	\$60,469	\$90,852	\$166,913
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	None	None	None	None
Total amount of current income	\$50,751	\$60,469	\$90,852	\$166,913
<i>Total amount of current expenditures</i>	\$50,010	\$68,384	\$83,637	\$130,677
Surplus for the year	741	...	7,215	36,236
Deficit for the year	...	7,915	...	...
Total amount of accumulated surplus	377	4,807	8,329	41,699
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	None	None	None	None
Average amount expended by the School per student (D.D.S.) per year	321	347	347	291
Average amount of all student fees paid to the School per student (D.D.S.) per year	181	215	220	283
<i>Details of expenditures:</i>				
For reduction in principal of debt	None	10,000	3,250	3,250
For interest on debt	152	107	780	585
For rent	None	None	None	5,000 ²
For repairs	None	2,774	5,320	3,864
For new equipment }				
For new construction (or land, or both)	3,574	3,727	9,930	2,098
For research	None	None	None	None
For improvement of the library	532	399	503	None
For supplies used in the clinical departments	7,543	8,081	8,944	14,081
For salaries: for administration	5,190	5,670	6,770	9,586
For salaries: for teaching	20,100	24,870	26,410	56,166
For all other purposes	12,919	12,756	21,730	36,047
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(12)	(13)	(15)	(20)
Amount of their salaries as teachers	10,740	15,520	16,540	41,166
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	2,400	3,600	4,000	4,000
Smallest salary paid to a whole-time teacher of a dental subject	1,800	1,800	1,800	1,800
(Number of teachers of academic or medico-dental subjects)	(8)	(8)	(10)	(18)
Amount of their salaries as teachers (including a proper allotment of university salaries for the instruction of dental students) ³	9,360	9,350	9,870	15,000
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	None	None	1,800	1,600
In the Medical School	None	None	None	5,000

¹The Baltimore College of Dental Surgery was united with the School on June 15, 1923.

²For the use of the building owned by the stockholders of the former Baltimore College of Dental Surgery. The tenancy will continue until the end of 1925-26.

³For salaries of members of the Faculty of the Academic College who gave instruction in the Dental School.

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24 ¹
Data for years ending on September 30				
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	None	None	\$1,800	\$1,600
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University (the "allotment" referred to above)	None	None	4,100 ²	4,100 ²

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 54. Of this total number, 2 were whole-time, 1 was a half-time, and 19 were part-time or occasional teachers of academic or medico-dental subjects; 7 were whole-time, 4 half-time, and 21 part-time or occasional teachers of dental subjects; 9 were whole-time teachers in the Dental School only; 15 were "full" professors; 10 were assistant professors; 8 were lecturers by title; all received salaries; 20 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Summer courses in clinical dentistry (June, July, August, and September): since 1924; attendance: 1924-60; 1925-60

No combined curricula leading to the degrees of B.S. or B.A. and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: none in progress in 1924-25; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

STUDENTS AND GRADUATES: DENTAL SCHOOL, UNIVERSITY OF MARYLAND

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	134	119	168	209	246	472
Women.....	0	0	0	1	2	2
From other countries; chiefly from Japan, Russia, and Germany.....	1	2	1	2	1	7
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	132	106	156	197	241	449
Admitted after examination.....	0	0	0	1	1	0
Admitted to advanced standing.....	10	16	21	5	5	1
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	0	6	5	18	18	21
Denied further instruction because of deficient scholarship.....	0	1	0	0	0	2
GRADUATES (D.D.S.)						
Total number of graduates.....	89	12	32	29	45	99
Women.....	0	0	0	0	1	0
Admitted to practice in other countries.....	7	1	2	1	0	1
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	12	4	3	7	7	16
Percentages of failures in such state-board examinations.....	28.2	27.3	14.3	8.3	17.0	30.7

¹ The Baltimore College of Dental Surgery was united with the School on June 15, 1923.

² For salaries of members of the Faculty of the Academic College who gave instruction in the Dental School.

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: December, 1921; June and November, 1923; January, 1926

The foregoing data have been verified in detail by the Dean

SUMMARY

WHEN the Baltimore College of Dental Surgery, the original dental school, was visited during the progress of the present study, it was evident that the School had failed to keep pace with the development of the profession it helped to found.¹ Although it had become one of the unacceptable schools in the United States, the "old Baltimore College," because of its early service as the pioneer, retained a strong sentimental hold upon the interest of dentists everywhere, which unfortunately the School's owners did not hesitate to exploit.² Consequently, in 1923, the consolidation of the Baltimore College of Dental Surgery with the Dental School of the University of Maryland was a union of direct importance for the ultimate improvement of dental education in Maryland. It was also an amalgamation of historic significance for dentistry, because it combined the original dental school with that of the University which, by declining in 1839 to entertain the idea that dentistry was of sufficient importance to merit attention, occasioned the establishment of

DATA PERTAINING TO THE DENTAL SCHOOLS IN BALTIMORE: 1922-26

Classification of the attendance at each of the two dental schools in Baltimore, in 1922-23, the year before their union

	<i>Percentage resident in Maryland</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>	<i>Graduates</i>
Baltimore	9	72	62	60	76	270	65
Maryland	11	73	78	43	48	242	45
Total		145	140	103	124	512	110

Total attendance of dental students at the University of Maryland since the union of the two Baltimore schools in 1923

1923-24	17	102	132 ³	132 ³	106 ³	472	99
1924-25	17	127	103	124 ³	136 ³	490	116
1925-26 ⁴	15	111	107	106	133 ³	457	...

¹ The Baltimore College of Dental Surgery was visited in December, 1921, and in January, 1923.

² The highly unsatisfactory character of the instruction at the Baltimore College of Dental Surgery during its last four years is indicated by the consistently excessive proportion of its graduates who failed in the license examinations, as recorded in the official annual reports:

	<i>Percentage of graduates who failed in license examinations</i>			
	1920	1921	1922	1923
Baltimore College of Dental Surgery:				
For the year	37.5	50.0	51.6	40.0
Cumulative since 1910	25.9	28.0	29.4	30.2
U. S. dental schools collectively:				
For the year	19.6	13.3	12.6	10.1
Cumulative since 1910	15.4	15.3	15.1	14.6

³ A combination of the corresponding classes that had been admitted to the schools before their amalgamation.

⁴ All of the dental schools in Massachusetts, New York, Pennsylvania, District of Columbia, Virginia, Tennessee, Kentucky, Ohio, and Michigan, now require (1925-26) at least one year of approved work in an accredited academic college for admission; the Maryland School, which does not, has probably received a large number of students because of this difference.

the first college of dentistry (page 39). The merger nearly doubled the attendance at the enlarged institution.

The amalgamation of the two schools created obligations and presented opportunities that the University appreciates. Lack of financial support by the state prevents the new School from meeting these responsibilities. Yet the large annual profits since 1923, which were \$36,236 for 1923-24 and \$36,904 for 1924-25, indicate that the School could do much better in certain important respects if it were free to use dental income currently for dental purposes. In 1923-24, the income from fees paid by students, exclusive of fees paid by patients, was \$126,995, but the total expense was only \$3682 more than that. In 1924-25, the total expense was only \$4627 in excess of the fees paid by the students. In 1923-24, the salaries of thirty-eight teachers, including four on whole-time service, amounted to \$56,166; in 1924-25, fifty-four teachers, nine of whom were whole-time officers, received \$61,135. During these two years there were no significant expenditures for a library, and none for research; and the Faculty confined its attention to the undergraduate curriculum. Although the School is closely associated with the Medical School, it derives little advantage from the relationship, and does not improve the opportunity to strengthen its instruction in the correlations of clinical dentistry with clinical medicine. The University needs funds for the erection of new buildings for each of the units in its health-service group. The Dental School, now housed in three unsuitable buildings, and having inadequate equipment in general, will not be able to serve the state to the greatest advantage while it is conducted on a commercial basis.

In conformity with conditions that prevail in Canada and the United States, the Medical School of the University of Maryland requires its students to take formal courses in the common specialties, but offers none in any aspect of oral health-service. There are no dentists in the Faculty of the Medical School, or on the staff of the University Hospital or of its Dispensary. The Dispensary Report, in the annual Announcement of the Medical School for 1925-26, designates sixteen general types of cases and a total of 63,356 treatments for the calendar year 1924; but, although ophthalmology, "nose and throat," and proctology are among the designated types, neither dental nor oral conditions are listed. In the report for the affiliated Mercy Hospital, however, dental treatments are given and the number specified — 692 in a total of 17,938 for the calendar year 1924. It is interesting to note that, in the annual Announcements of the Medical School, special attention is drawn to the priority of the School in various important developments in "the oldest structure in America devoted to medical teaching," among them the fact that "here instruction in dentistry was first given (1837)."

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of this School who failed, in the number of states indicated by the figures in parenthesis: 1925. — 19.6 (12); U. S. schools collectively, 11.3. 1921-25 (cumulative). — 21.1 (?); U. S. schools collectively, 11.7.

GENERAL COMMENT

ALTHOUGH Johns Hopkins University is one of the most important centres of health-service education in the world, it does not contain a dental school, and its medical students are not offered courses in clinical dentistry, odontology, or stomatology, but laryngology, ophthalmology, and the kindred domains are not neglected. Instruction in oral hygiene has also failed to attain a formal stage at the Johns Hopkins School of Hygiene and Public Health. Johns Hopkins, which might be one of the most influential factors for the advancement of oral health-service, has evidently taken over the old Maryland tradition respecting the relation of the study of dentistry to the study of medicine, although the position of the Johns Hopkins Medical

School in this regard is similar to that of most American medical schools. An illustration is to be found in the following typical quotation from page 88 of the annual Announcement, for 1925-26, regarding the required work in laryngology:

"It is our desire to train every student in the use of the laryngeal mirror, the otoscope, the interpretation of x-ray plates and other methods necessary for the recognition of disease in the accessory nasal sinuses, ears, tonsils, larynx, and oesophagus. Each student in the second-year class receives individual instruction in the anatomy of the upper air passages and the use of the various diagnostic instruments. They . . . are required to examine the nasal cavities, throat, and vocal cords in each other." In short, students are taught to examine almost everything in this region except the teeth.

In the three-page index in the same Announcement of the Johns Hopkins Medical School the words tooth, mouth, oral, dentistry, odontology, and stomatology, do not appear, although ear, eye, nose, and throat, or equivalent words, have their accustomed places. This Announcement contains no suggestions of attempts to correlate instruction in clinical dentistry with clinical medicine, and there are no indications of elective or graduate courses in any phases of clinical dentistry or stomatology, but advanced courses are very numerous for other regions of the body. That oral health-service is not entirely neglected at Johns Hopkins, however, is suggested by the fact that a "consulting dental staff" of five dentists is appended to the official list of the members of the Medical Staff of the Johns Hopkins Hospital. The same dentists, with three others,¹ constitute the Staff of the Section of Dentistry in the Department of Surgery of the Johns Hopkins Dispensary, where they serve as dental surgeons, but they do not appear to offer courses and are not listed with the teachers of medical students.²

With respect to the Medical School of Johns Hopkins University two inferences would appear to possess a measure of justification: there exists at that School an obvious inattention to clinical dentistry, which indicates, it is to be hoped only superficially, a disregard for the teeth as factors in the development of extra-dental maladies; but it may also reflect low esteem for the conventional practice of dentistry generally as well as for the present quality of dental education in Baltimore. The inferior educational status of dentistry in Maryland (page 369), encouraged by statute with the approval of Maryland dentists, has seemed to justify such disrespect. The Dental School of the University of Maryland and the citizens of the state cannot escape the consequences of such influences as these at one of the most important universities, where a clear insight into the possibilities of improved oral health-service would be expected, and where leadership in advanced education for such service would be highly influential. Under these conditions the Dental School of the University of Maryland should receive the critical attention of the Regents of the University³ as the representatives of the State of Maryland.

The accompanying data for the geographical distribution of the dental students at the University of Maryland, in 1924-25, show that of the total number of students in an overcrowded school, in that year, only one in six (17 per cent) resided in Maryland, the largest number having been received from New Jersey. The propor-

¹ One of the three is Professor of Orthodontia and Comparative Dental Anatomy in the Dental School of the University of Maryland. This is not a coöperative relation.

² A former member of the consulting dental staff recently succeeded in conducting research in the nutrition laboratories of the School of Hygiene and Public Health on the relation of diet to dentition, and in awakening casual interest in this subject.

³ The President of Johns Hopkins University is a member of the Board of Regents of the University of Maryland.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF
MARYLAND: 1924-25

<i>States (18), territories (2), and foreign countries (4)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year¹</i>	<i>Fourth year¹</i>	<i>Total</i>
Canada	1	0	5	1	7
Connecticut	13	9	13	10	45
Delaware	0	1	3	2	6
District of Columbia	2	3	1	1	7
Maine	0	4	4	3	11
Maryland	20	16	26	22	84
Massachusetts	4	2	7	6	19
New Jersey	38	26	20	23	107
New York	8	2	3	4	17
North Carolina	4	6	6	5	21
Ohio	1	2	1	1	5
Pennsylvania	15	11	9	20	55
Porto Rico	2	1	1	6	10
Rhode Island	0	0	5	2	7
Vermont	2	2	1	2	7
Virginia	5	5	5	11	26
West Virginia	10	10	9	15	44
Alabama, Florida, South Africa, Tennessee— one each	1	0	2	1	4
Cuba, South Carolina, Trinidad—two or three each	1	3	3	1	8
Total	127	103	124	136	490
Number of states and countries	16	17	21	19	24

tion of Marylanders was the same in 1923-24, but in 1922-23 it was only one in nine (11 per cent); now, 1925-26, it is one in seven (15 per cent). In the table on page 373, the data relating to scholarship suggest that for some years admission to this School was almost equivalent to assurance of graduation. When it is considered that the School has long carried a Class B rating, and that the Baltimore College of Dental Surgery which was united with it had become notably undeserving of its Class B rating (footnote 2, page 374), the popularity of the School cannot be ascribed to merit. This view is substantiated by the fact that, in 1924, the proportion of failures in state-board examinations, which for years had been high for each school, was 30.7 for the consolidated schools in the sixteen states in which candidates were examined. In 1925 the percentage of failures was 19.6 in twelve states. These conditions, and the accumulation of large surpluses since the amalgamation in 1923, already noted, are scarcely calculated to promote respect for dental education or for dentistry in a vicinity where the tendency of medical leadership appears to imply a disregard for the teeth, and an unconcern for the recent view that the practice of dentistry is primarily health service. Thorough reorganization of the Dental School in an adequate building, special attention to improvement in the quality of the instruction, betterment of the facilities, creation of a good library, and promotion of graduate study and research, are among the School's most urgent needs.

¹ Includes students at the Baltimore College of Dental Surgery when it was united with the Dental School of the University of Maryland in June, 1923.

MASSACHUSETTS

Population: 4,102,626. Number of dentists, 3321; physicians, 6187. Ratios: dentists to population, 1: 1235; physicians to population, 1: 663; dentists to physicians, 1: 1.9

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited high school or its equivalent. Professional training: diploma from a reputable dental school. A person who has spent four years in a reputable dental school having a four-year curriculum of not less than 32 weeks each, and has successfully passed all examinations of the first, second, and third years, but has not received a degree, may, at the discretion of the board, take the license examination.

Medicine.—Preliminary education: graduation from a high school or the equivalent. Professional training: graduation, with the degree of doctor of medicine, from a legally chartered medical school having a full four-year curriculum of not less than 36 weeks annually, and the power to confer degrees

Location of the dental schools (2): Boston; medical schools (5): Boston (4), and Cambridge

BOSTON

Population: 779,975. Number of dentists, 1190; physicians, 2269. Ratios: dentists to population, 1: 655; physicians to population, 1: 344; dentists to physicians, 1: 1.9

Number of dental clinics or infirmaries, 12; hospitals, sanatoriums, and charitable institutions, 73; hospitals approved for internships, 7

Dental Schools: (1) Harvard University, (2) Tufts College. *Medical Schools* (4): Boston University, Harvard University, Tufts College, and College of Physicians and Surgeons

(1) DENTAL SCHOOL, HARVARD UNIVERSITY

Location: Longwood Avenue and Wigglesworth Street; two miles from the centre of Boston

General character: integral part of Harvard University

Organized: in 1867, the first dental school permanently established by a university

Building: erected in 1909, adjacent to the Medical School and connected with it by subway; special improvements were made in 1922; total floor area, 27,192 sq. ft. Distance from the main site of the University (Cambridge), three miles

Infirmary: in the dental building, with ten accessory rooms; total floor area, 6833 sq. ft. Total number of chairs in active use, 115, including groups reserved for special purposes: prosthodontia, 32; extraction, 3

Relation of the School of Medicine (Class A): all of the instruction in the medico-dental subjects is given to dental students in separate classes in the Medical School. All of the full professors in the Dental School are members, also, of the Faculty of Medicine. The Dental School, which does not have an executive faculty, is controlled, through an Administrative Board of eight dental professors, by the Faculty of Medicine. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospitals and Infirmary in which dental students received accredited instruction in 1924-25: Boston City Hospital (two miles), Children's Hospital (adjacent), Massachusetts General Hospital (three miles), and the Forsyth Dental Infirmary (one-half mile)

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Hospitals and Infirmary in which dental students received accredited instruction in 1924-25: Boston City Hospital (two miles), Children's Hospital (adjacent), Massachusetts General Hospital (three miles), and the Forsyth Dental Infirmary (one-half mile)

Clinical facilities in the Hospitals where dental students received instruction in 1924-25: complete for all aspects of medicine and surgery

Number of dental externships (no internships), held by officers of the School, in the Hospitals in 1924-25: twenty

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: clinics in syphilology, exodontia, oral surgery, rhinology, and laryngology; to teach oral surgery under the conditions prevailing in good hospitals

Library (in the dental building): room, 560 sq. ft.; part-time librarian. Contains about 4000 bound and 15,000 unbound volumes, and 1310 pamphlets (all effectively card indexed). Of the volumes, approximately 75 per cent relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Library of the Medical School; Boston Medical Library (one mile)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: fourteen students; total amount, \$1163, of which \$355 was provided by the School, the remainder by the University

Dean: part-time officer; also Professor of Clinical Oral Surgery. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: secretary to the Dean and Chief Clerk of the School; whole-time officer

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: two years of approved work in an accredited academic college, beginning in September, 1926

Number of graduates (1869-1925): 1487; average per year, for fifty-seven years, 26

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 204; proportion from Massachusetts: 1922-23—40 per cent; 1923-24—43 per cent; 1924-25—43 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—9156; 1921-22—12,671; 1922-23—12,959; 1923-24—15,584; 1924-25—16,350

Number of operations: 1920-21—27,430; 1921-22—41,347; 1922-23—39,687; 1923-24—43,205; 1924-25—32,174

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-25—none

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$385,000, and equipment, \$50,000; total, \$435,000 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): \$34,548 at 5 per cent interest per annum. On June 30, 1923, the University wrote off the Dental School's then existing debt of \$260,961.95, of which \$156,941.69 was recorded on the School's operating account and \$104,020.26 on the cost of construction of the present dental building; also paid the interest charge for 1922-23, amounting to \$13,048.09, but not the deficit for that year (\$8535)

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Appropriation by the State	\$100 ²	None	None	None
Fees (all kinds) paid by the students	34,122	\$45,063	\$50,542	\$41,119
Fees paid by patients, in all clinical departments	24,074	29,902	36,729	41,165
Interest on endowment	10,420	8,528	9,255	9,218
Gifts	None	None	None	878
Miscellaneous receipts	11,969	194	245	375
University funds, additional to the income designated above:				
(a) Direct appropriation	6,000	None	None ³	None
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	None	None	None ³	None
Total amount of current income	\$86,685	\$83,687	\$96,771	\$92,755
<i>Total amount of current expenditures</i>	\$125,692	\$113,993	\$105,306	\$100,820
Deficit for the year	39,007 ³	30,306 ³	8,535 ⁴	8,065 ⁴
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	45,007	30,306	None ³	None
<i>Capital expenditures</i> (additional) by the University:				
For liquidation of the debt (See "General debt," above)	None	None	\$260,962	None
For interest on the debt	None	None	13,048	None
Total	None	None	\$274,010	None
Average amount expended by the School per student (D.M.D.) per year	551	570	476	593
Average amount of all student fees paid to the School per student (D.M.D.) per year	150	225	229	242
<i>Details of current expenditures:</i> ⁵				
For interest on debt	9,583	11,533	None ⁶	427 ⁷
For repairs		1,107	852	289
For new equipment	869	1,825	1,265	1,041
For research	2,500	2,500	2,500	2,500
For improvement of the library	208	153	41	12
For supplies used in the clinical departments	18,211	16,648	16,597	15,862
For salaries: for administration ⁸	2,087	4,634	4,208	4,656
For salaries: for teaching	59,115	46,150	50,100	49,176
For all other purposes	33,119	29,443	29,743	26,857

¹ During the academic years 1920-24, there was no appropriation by the City; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² Rent for the use of the Infirmary by the State Board of Dental Examiners.

³ On June 30, 1923, the School's debt of \$260,961.95, including recent deficits, was written off by the University. See footnote 5.

⁴ Included in the School's present debt to the University.

⁵ During the academic years 1920-24, there was no payment, from current income, for reduction in the principal of the debt, and none for rent, new construction, or land. See footnotes 2 and 5.

⁶ Paid by the University from other funds; \$13,048.09. See "Capital expenditures," above.

⁷ Interest on the deficit of \$8535 for 1922-23.

⁸ Salaries of the Dean's executive staff.

	(1)	(2)	(3)	(4)
	1920-21	1921-22	1922-23	1923-24
Data for years ending on June 30				
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(146)	(131)	(133)	(127)
Amount of their salaries as teachers	\$42,815	\$37,400	\$38,650	\$37,376
Number of teachers of dental subjects who did not receive salaries or honoraria	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	4,000	4,000	4,000	4,000
Smallest salary paid to a whole-time teacher of a dental subject	4,000	4,000	4,000	4,000
(Number of teachers of academic or medico-dental subjects)	(32)	(32)	(32)	(32)
Amount of their salaries as teachers ¹	16,300	8,750	11,450	11,800
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	4,000	4,000	4,000	4,000
In the Medical School	8,000	8,000	8,000	8,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	4,000	4,000	4,000	4,000
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget ²	None	None	None	None

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 154. Of this total number, 26 were whole-time, none half-time, and 12 part-time or occasional teachers of medico-dental subjects; 2 were whole-time, 6 half-time, and 108 part-time or occasional teachers of dental subjects; 2 were whole-time teachers in the Dental School only; 11 were "full" professors; 19 were associate, assistant, or clinical professors; 1 was a lecturer by title; 95 received no salaries;³ 40 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Advanced courses for dental practitioners: in orthodontia and oral surgery since 1924; attendance: 1924-25—5; 1925-26—7

No combined curricula leading to the degrees of B.S. or B.A., and D.M.D.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no summer course in clinical dentistry; no dental extension teaching

Research: actively in progress in 1924-25, on pathology of bone in relation to diet; relative alveolar destruction in diabetes; bacteriology of pulpless root canals; variations in personal comfort from partial plates of various types; etiology and treatment of Vincent's ulcerative gingivitis; several publications in 1924 and 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

¹ Includes the amount paid to the Medical School for the instruction of dental students in the medico-dental subjects. See footnote 2.

² The medico-dental subjects are taught to the dental students in separate classes, in the medical laboratories, by members of the Medical Faculty. The Medical School is paid for this service, from current dental income, at the rate of \$150 per first-year student. The payments to the Medical School on this account for the years 1920-24, inclusive, were \$11,150, \$3600, \$6200, and \$6550, respectively.

³ All received honoraria of \$50 or \$100.

DENTAL SCHOOLS IN THE UNITED STATES

STUDENTS AND GRADUATES: DENTAL SCHOOL, HARVARD UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.M.D.)						
Maximum attendance.....	160	195	230	207	223	191
Women.....	0	0	0	0	0	0
From other countries: chiefly from South Africa, Australia, England, and Scandinavia.....	12	27	28	35	36	29
Negroes.....	4	2	5	5	5	8
Attendance at the end of the year.....	154	181	228	200	221	170
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	6	10	9	7	10	9
From other countries, to advanced standing.....	0	5	4	7	6	6
"Repeaters" of one or more subjects.....	4	18	7	15	18	13
Denied further instruction because of deficient scholarship.....	6	11	9	2	5	9
GRADUATES (D.M.D.)						
Total number of graduates.....	56	16	37	45	56	70
Women.....	0	0	0	0	0	0
Admitted to practice in other countries.....	5	3	6	9	11	10
Negroes.....	1	0	0	0	1	2
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	6	3	4	5	10	6
Percentages of failures in such state-board examinations.....	16.3	55.6	0	3.1	5.8	15.1

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: January and September, 1922; June, 1924; December, 1925

The foregoing data have been verified in detail by the Dean

SUMMARY

THIS was the first permanent dental school in a university and the first associated with a medical school. It is also the oldest of the dental schools that have retained their original status, all of the earlier schools, which with one unimportant exception were independent, having been discontinued or made parts of universities. Although the School has been conducted under the control of the Medical Faculty, and all of its full professors are members of that Faculty, the Dental School is not a part of the Medical School but is a separate unit having the main features of a conventional school of dentistry.¹ This relation between the two schools, while not tending to encourage the conversion of dentistry into a specialty of the practice of medicine, has failed to bring about the intimate coordination between clinical dentistry and clinical medicine, in the instruction at either School, that the association of the Dental School with the Medical School and Hospitals would seem to facilitate. Dentistry is so completely subordinated at the Harvard Medical School that neither required nor elective courses in any aspect of oral health-service, including oral surgery, appear to be offered to the students, although the most common medical specialties occupy their usual places in the curriculum. The Announcements of the Harvard School of Public Health, which is very closely affiliated with the Medical School, do not refer to dental or oral hygiene in any special way as important factors in the maintenance of health.

¹In the Announcement of the Harvard Dental School for 1923-24, the first name on the list of members of the Administrative Board is that of the Dean of the Faculty of the Dental School, and it was indicated that the Board consisted solely of members of that Faculty. In the Announcements for 1924-25 and 1925-26, however, the first name on the list of the members of the Board is that of the Dean of the "Faculty of Medicine and Dentistry," the only member who is not primarily a member of the Faculty of Dentistry. In the recent Announcements of the Harvard Medical School there is no indication that the Dean of the Medical School is also Dean of the Faculty of Medicine and Dentistry, but the Faculty of the Medical School, containing some of the dental professors, is designated simply "Faculty of Medicine." The University Announcements indicate that the Dean of the Medical School is "Dean of the Faculty of Medicine and Dentistry."

The name of the Dental School, which for a time had not been mentioned, was included in 1925-26 among those of the schools and local institutions in which courses may be taken by students in the School of Public Health. There are no members of the Dental Faculty on the staff of the Department of Surgery of the Harvard Medical School, but the Dean of the Dental School, who is also the Professor of Clinical Oral Surgery in the Dental School, is a member of the staff of the Department of Surgery in the Medical School of Boston University, where, as Associate Professor of Stomatology, he gives the third-year students four lectures in stomatology.

A recent experience of the Administrative Board of the Harvard Dental School, in an endeavor to make the practice of dentistry an accredited specialty of the practice of medicine, illustrates the inherent difficulties in the way of such a transformation. The Board proposed, in effect, that prospective dentists be given an adapted training for the medical degree followed by a graduate training for the dental degree. It was suggested that the first two years of the medical curriculum, a third year in clinical medicine and surgery, and a fourth year in dental technology and clinical dentistry be combined as an acceptable curriculum for the medical degree, and that a fifth professional year in general dentistry, as a graduate year, be offered for the dental degree. This proposal, which was rejected, encountered some of the serious obstacles indicated elsewhere in this Bulletin. The medical curriculum is too rigid, and the views of medical state boards and of medical teachers are too unyielding, to permit substitution of training in the essential mechanical and esthetic aspects of dentistry for anything now contained in the required parts of the undergraduate medical curriculum. The establishment of combined curricula for the medical or dental degrees or both, on plans that would attach more importance to content than to labels, for the purpose of developing exceptional capability in prospective practitioners of the most advanced aspects of dentistry, deserves the attention of all of the universities where the resources for the support of health-service education are abundant, and where the income from fees is not a matter of prime importance.

This School is one of the few that receive income from endowment. In 1923 the cancellation of an accumulated debt of \$261,000, and also of a charge for interest amounting to \$13,000 for 1922-23, was an impressive indication of the ability of the University to give the School liberal support. The custom of maintaining a very large "visiting staff" of part-time teachers, and the payment in 1923-24 of only \$37,376 in salaries and honoraria to 127 teachers of dental subjects, and in 1924-25 of only \$35,475 to 116 teachers of dental subjects, to cite conditions for the past two years as illustrations, indicate an anomalous conception of the School's obligation to provide good instruction. There is a striking difference between the maximum whole-time salaries for instruction in the Dental School and those in the Medical School. Of the large number of teachers, during each of these two years, only two gave whole-time service in the School. Some of these conditions, which are strongly suggestive of the superficiality of proprietary schools, do not maintain the Harvard traditions of scholarship or educational sincerity.

The Faculty has confined its attention almost entirely to the undergraduate curriculum. The number of foreign students has been relatively large. The library, which is one of the best in dental schools, would be much more useful if its large accumulation of unbound volumes were made accessible. An Assistant Professor of Dental Research stimulates interest in original investigation, not only by conducting research but also through the agency of lectures and conferences for third-year students. The Harriet Newell Lowell Society for Dental Research, which is an organization of the students primarily, gives active encouragement to the spirit of enquiry.¹ A collection of over 6000 specimens of plaster masks, photographs, and stereopticon pictures of the faces of soldiers, showing cases before and after plastic operations, including corresponding roentgenograms and drawings,

¹ From 1907 to 1917, inclusive, the Society received the income of a fund of \$50,000, which was used in the main for the promotion of research.

which were assembled in France by Dr. Kazanjian and his associates during their eminent service in the World War, adds distinction to a good teaching museum. The educational affiliations with the Forsyth Dental Infirmary for Children are indicated on page 390. Data relating to the geographical distribution of the students, in 1924-25, are given in the accompanying table; to students and graduates, on page 393; to results of license examinations, on page 394.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT HARVARD UNIVERSITY: 1924-25

<i>States (17), territory (1), and foreign countries (10)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Canada	2	2	2	1	7
Connecticut	7	5	1	2	15
Maine	3	0	2	1	6
Massachusetts	38	17	17	13	85
New Jersey	7	0	2	1	10
New York	20	5	6	6	37
Rhode Island	3	1	1	1	6
Virginia	1	0	3	1	5
Australia, Florida, France, Greece, India, Iowa, Japan, Minnesota, New Hampshire, North Carolina, Norway, Porto Rico, Switzerland, Texas — one each	4	3	1	6	14
Illinois, Pennsylvania, South Africa, Sweden, Tennessee, Vermont — two or three each	3	2	1	7	13
Total	88	35	36	39	198
Middle Atlantic states (3)	27	5	8	9	49
New England, outside of Massachusetts	13	7	4	4	28

(2) DENTAL SCHOOL, TUFTS COLLEGE

Location: 416 Huntington Avenue; one mile from the centre of Boston

General character: integral part of Tufts College

Organized: in 1899, by absorption of the Boston Dental College (1868-99)

Buildings: two; occupied jointly by the Medical and Dental Schools. The main building was erected in 1900; special improvements were made in the dental rooms in 1922; total floor area, 48,750 sq. ft. A smaller anatomical building, erected in 1915, was enlarged in 1917, to include chemical laboratories; total floor area, 5880 sq. ft. Present total floor area used in both buildings for the instruction of dental students, 54,630 sq. ft. Distance from the main site of the University (College Hill; Somerville and Medford), five miles

Infirmary: in the main building, with six accessory rooms; total floor area, 11,416 sq. ft. Total number of chairs in active use, 107, including groups reserved for special purposes: root-canal treatment, 16; prosthodontia, 9; crown and bridge work, 8; orthodontia, 6; extraction, 3

Relation of the School of Medicine (Class A): the medico-dental subjects are taught to dental students in separate classes, by members of the Medical Faculty, in laboratories used in common with the Medical School. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Dispensaries and Hospitals in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: Boston City Hospital (two miles); Boston Dispensary (two miles); Massachusetts Homeopathic Hospital (two miles); Massachusetts School for the Feeble Minded (five miles); Roxbury Hospital (one mile). (Tufts dental

students have not received accredited instruction at the Forsyth Dental Infirmary since 1923-24)

Clinical facilities in the Dispensaries and Hospitals where dental students received instruction in 1924-25: surgical clinics in the Hospitals; exodontia and general operative dentistry in the Massachusetts School for the Feeble Minded and in Roxbury Hospital

Number of dental externships (no internships), held by officers of the School, in the Dispensaries and Hospitals in 1924-25: sixteen

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: exodontia, oral surgery, and operative dentistry; to enlarge the clinical experience of the students and to teach dentistry under the surgical conditions that prevail in good hospitals

Library (primarily medical): room, 1148 sq. ft.; whole-time librarian. Contains 1369 bound and 3000 unbound volumes, and 1500 pamphlets (all effectively card indexed). Of the volumes, approximately 350 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Boston Medical Library (one-fourth mile); in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: one; total amount, \$200, all of which was provided by the School

Dean: whole-time officer; also Professor of Operative Dentistry. *Vice-Dean*: part-time officer; also Professor of Pharmacology (also Vice-Dean of the Medical School and Professor of Pharmacology therein). *Secretary*: part-time officer; also Professor of Pharmacology, and Physical Diagnosis (also Secretary of the Medical School and Professor of Pharmacology therein)

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: two years of approved work in an accredited academic college, beginning in September, 1927

The School will reorganize its program of studies to accord with the two-three-graduate plan, beginning in September, 1927

Number of graduates (1900-25): 1840; average per year, for twenty-six years, 71. (Number for the Boston Dental College, 1869-99—469; average per year, for thirty-one years, 15)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 387; proportion from Massachusetts: 1922-23—66 per cent; 1923-24—63 per cent; 1924-25—61 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—9000; 1921-22—9000; 1922-23—9233; 1923-24—7410; 1924-25—6185 (the figures for 1920-22 are estimates)

Number of visits: 1920-21—26,960; 1921-22—27,500; 1922-23—29,000; 1923-24—24,775; 1924-25—18,000 (the figures are estimates)

Number of patients treated in the Dispensaries and Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-21—3000; 1921-22—3000; 1922-23—4000; 1923-24—4000; 1924-25—6000 (the figures are estimates)

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value of land and buildings used by the Medical and Dental Schools in common, \$388,787, and of equipment used exclusively by the Dental School, \$59,190; total, \$447,977 (June 30, 1925)¹

General debt on the School, or carried by the University on the School's account (June 30, 1925): \$156,000 at 6.5 per cent interest per annum. (A mortgage on the property; no floating debt)

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ²				
Fees (all kinds) paid by the students	\$101,440	\$93,739	\$85,225	\$62,409
Fees paid by patients, in all clinical departments	26,530	27,650	37,926	36,281
Miscellaneous receipts	7,867	5,614	653	735
Tufts College funds, additional to the income designated above:				
(a) Direct appropriation	7,154	14,623	21,093	33,959
(b) Estimated amount of miscellaneous income available to the School as an integral part of Tufts College, but not specified in the dental budget	None	None	None	None
Total amount of current income	\$142,991	\$141,626	\$144,897	\$133,384
<i>Total amount of current expenditures</i>	\$142,991	\$141,626	\$144,897	\$133,384
Amount expended for the School by Tufts College, in excess of dental income, and included in "Tufts College funds," above (see rental, below)	7,154	14,623	21,093	33,959
Average amount expended by the School per student (D.M.D.) per year	278	334	401	513
Average amount of all student fees paid to the School per student (D.M.D.) per year	197	221	236	240
<i>Details of expenditures:</i>				
For reduction in principal of debt	None	None	None	None
For interest on debt	4,417	5,770	4,400	4,300
For rent (paid to Tufts College)	5,672	4,581	None	None
For repairs	4,461	1,575	2,807	10,431
For new equipment	No available data			
For new construction (no land)	45,000	None	None	None
For research	None	None	None	None
For improvement of the library	674	239	54	203
For supplies used in the clinical departments	16,885	20,743	27,014	20,921
For salaries: for administration	7,224	7,289	11,786	12,322
For salaries: for teaching	55,671	60,469	60,843	59,750
For all other purposes	2,987	40,960	37,993	25,457
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects) ³	(61)	(122)	(123)	(119)
Amount of their salaries as teachers	37,258	39,754	40,853	41,713

¹ The value of the equipment used jointly by the two schools is approximately \$100,000, on which the Dental School's share of the indebtedness is \$59,190.

² During the academic years 1920-24, there was no surplus, no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

³ Includes the members of the visiting staff. See "Number of teachers," etc., below; also footnote 2, on page 387.

MASSACHUSETTS

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	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Number of teachers of dental subjects who did not receive salaries	(20)	(73)	(70)	(75)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	\$4,500	\$4,500	\$4,500	\$5,000
Smallest salary paid to a whole-time teacher of a dental subject	1,500	1,500	1,500	1,500
(Number of teachers of academic or medico-dental subjects)	(31)	(41)	(42)	(33)
Amount of their salaries as teachers (including a proper allotment of Tufts College or medical salaries for the instruction of dental students)	18,413	20,715	19,990	18,037
Largest salary paid to a whole-time teacher of an academic or medico-dental subject ¹	3,600	3,600	4,000	4,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject ¹	2,250	2,250	2,250	2,250
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by Tufts College or from the medical budget (the "allotment" referred to above)	None	None	None	None

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 131.² Of this total number, 7 were whole-time, none half-time, and 22 part-time or occasional teachers of academic or medico-dental subjects; 6 were whole-time, 14 half-time, and 82 part-time or occasional teachers of dental subjects; ²6 were whole-time teachers in the Dental School only; 14 were "full" professors; 17 were associate, assistant, or clinical professors; none was a lecturer by title; 60 received no salaries; ²30 were teachers with degrees other than, or

STUDENTS AND GRADUATES: DENTAL SCHOOL, TUFTS COLLEGE

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.M.D.)						
Maximum attendance.....	503	425	564	424	361	266
Women.....	10	15	10	15	12	8
From other countries; chiefly from Norway, Serbia, and South Africa.....	9	2	7	12	11	11
Negroes.....	No available data	No available data			6	11
Attendance at the end of the year.....	488	418	514	424	361	260
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	0	0	0	0	1	0
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	No available data	No available data				
Denied further instruction because of deficient scholarship.....	11	20	15	10	6	2
GRADUATES (D.M.D.)						
Total number of graduates.....	153	12	59	78	141	125
Women.....	4	1	1	0	5	5
Admitted to practice in other countries.....	No available data	No available data				
Negroes.....	No available data	No available data				2
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	5	2	4	8	7	8
Percentages of failures in such state-board examinations.....	21.5	11.2	1.9	13.5	5.4	16.9

¹These salaries are allocated to the medical and dental budgets on the ratios of students taught and hours of instruction given in each school.

²Includes sixty unsalaried teachers constituting a "visiting staff," the members of which give service regularly. The size of the "visiting staff" is being steadily reduced.

additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Course for dental hygienists: in the Forsyth-Tufts Training School for Dental Hygienists, since 1919. (See page 391)

Advanced courses for dental practitioners: see "Summer courses," etc., below

Summer courses in clinical dentistry (July): given for practitioners in 1918 and 1924; attendance: 1918 — 15; 1924 — 29. Similar courses will be given in 1926

No combined curricula leading to the degrees of B.S. or B.A. and D.M.D.; no course for dental mechanics, assistants, or technicians; no graduate course in dentistry; no dental extension teaching

Research: actively in progress in 1924-25, on septic lesions of the mouth to determine results of treatment with ultra-violet light, locally and generally; the therapeutic value of the actinic rays of sunlight; no publication in 1924, one in 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service, but indicated opportunities for qualified dentists in private practice, and in hospitals or state institutions, are kept on file and communicated to the seniors

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: January, 1922; March and May, 1923; June, 1924; December, 1925

The foregoing data have been verified in detail by the Dean

SUMMARY

THERE is an intimate relationship between the Dental School and the Medical School in each of the two buildings they occupy jointly, but no tendency to convert dentistry from its independent status to that of a specialty of the practice of medicine. In the Dental School's effort to provide effective instruction in the correlations of clinical dentistry with clinical medicine, bedside clinics are conducted for the senior dental students at the Boston City Hospital, in close association with the Department of Pathology in the Medical School, by the Professor of Clinical Dental Pathology, a whole-time teacher. Eight hours a year are devoted by each dental senior to these clinics. Practical work in oral health-service is given in a number of associated hospitals. This School, like that at Harvard, has a very large "visiting staff" of part-time teachers of dental subjects, but its size is now being steadily reduced. In 1923-24 there were 75 teachers of dental subjects who received neither salaries nor honoraria; in 1924-25 the number of unsalaried teachers was 60. In 1923-24 the average amount paid to 44 salaried teachers of dental subjects was \$948; in 1924-25 to 42 salaried teachers it was \$919. In 1924-25 there were only six whole-time teachers of dental students. The comment on similar conditions at Harvard (page 383) might be appropriately repeated here. The medical students do not receive formal instruction in odontology, stomatology, clinical dentistry, oral surgery, or any aspect of oral health-service, but the conventional medical specialties are included in the medical curriculum.

For some years this School was conducted at a profit that was used in large part to support the Medical School. At present the Dental School carries a heavy debt on which an annual interest charge is paid from current income. Recently the School has been conducted at a financial loss, owing to decreased attendance since the elevation in 1921 of the academic requirement for admission, the amount paid by Tufts College in excess of dental income for the support of the School having increased annually to nearly \$35,000. Gifts for the liquidation of the indebtedness and endowment for more liberal maintenance

(dental prophylaxis)—600 hours; *special clinics*—bedside and ambulatory adult cases in hospitals; nose and throat, and oral surgery clinics; bedside nursing in wards, dental extraction, dental orthopedics, roentgenography, sterilization—100 hours; total, 1216 hours. Length, eight months; since 1922, beginning every alternate October, February, and June

Number of graduates (1917-26): 440; average per year, for ten years, 44

Present attendance (April, 1926): course begun in October, 1925, leading to graduation in May, 1926—63. See "Number of graduates," below

Disbursements in support of the school (salaries and supplies):

	1923 Feb.-Sept.	1923-24 Oct.-May	1924-25 June-Jan.	1925 Feb.-Sept.	1925-26 Oct.-May
Total	\$5,793	\$6,672	\$6,563	\$7,058	\$6,956
Per graduate	170	111	285	160	110

Fees (eight-months curriculum): matriculation, \$5; tuition, \$150; books and instruments additional. Total expense, exclusive of board and room, about \$200

NUMBER OF GRADUATES: FORSYTH-TUFTS TRAINING SCHOOL FOR DENTAL HYGIENISTS: 1917-26

Month of graduation	1917	1918	1919	1920	1921 ¹	1922	1923	1924	1925	1926	Total
September	13	23	21	34	39	..	34	..	44	..	208
May	..	..	..	..	..	51	..	60	..	63 ²	174
January	..	..	..	..	..	..	35	..	23	..	58
Total	13	23	21	34	39	51	69	60	67	63	440

Visited: January, 1922; December, 1925

The foregoing data have been verified in detail by the Director

SUMMARY

THIS Infirmary, one of the first important benefactions for the extension of oral health-service and a memorial of magnificent proportions, occupies the most imposing structure devoted primarily to the dental welfare of children. Having the largest amount of resources permanently reserved for this purpose, and daily bringing to many children the blessings of relief from distress or disability, it affords happy assurances of prevention of disease and of renewed health and vigor. The Infirmary's supplemental efforts in teaching and research, and its educational associations with Harvard and Tufts, promise by their extension and improvement, without impairment of the quality of the clinical work, to make the Infirmary a factor of increasing national importance in the training of all types of practitioners of oral health-service. The research that has been conducted under the auspices of the Infirmary is an augury of significant developments in the field of prevention, for the furtherance of which, in its numerous clinical aspects especially, additional endowment will be needed.

GENERAL COMMENT

NONE of the surrounding states, excepting New York, contains a dental school, the Massachusetts schools being the only ones in New England. Harvard, Tufts, and North Pacific College of Oregon are the only institutions that award D.M.D. instead of D.D.S. as the degree for general practitioners of dentistry. The degree was originated

¹ The curriculum extended through twelve months until October, 1921, when it was shortened to eight months; it is begun every alternate October, February, and June.

² The total present attendance (April, 1926).

at Harvard (page 72). Both of the dental schools in Massachusetts are educationally affiliated with the Forsyth Dental Infirmary for Children. This relation enables each school not only to cooperate in the Infirmary's oral health-service and in the teaching of its internes, but also to give the dental students opportunity to receive instruction at the Infirmary. Extensions of these relationships, including graduate study and research at the Infirmary, would strengthen the work of each of the institutions concerned, and by their example and influence would promote the development of dentistry and dental education not only in Massachusetts but also throughout the United States and Canada.

The relative contributions of Harvard and Tufts to the dental needs of Massachusetts and New England may be noted from the accompanying data pertaining to students and graduates. The figures for the last few years show a fluctuation in the number of students at Harvard, a decline in the total attendance at Tufts until 1925-26, and a general fall in the combined attendance at both until 1925-26, when there was a large gain at Tufts and a loss at Harvard, especially in the number of first-year students, although throughout these years the entrance requirements at the two schools were practically identical. At Tufts the number of first-year students has been increasing annually since 1921-22. There was a similar increase at Harvard until 1925-26. During the past few years the proportion of Massachusetts students, which is larger at Tufts, has been tending to decrease at both schools. The import of these

DATA PERTAINING TO THE TWO DENTAL SCHOOLS IN THE STATE OF MASSACHUSETTS: 1919-26

Total attendance

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Harvard	181	228	200 ¹	221	185	198	178
Tufts	418	514	424 ¹	361	260	204	288
Total	599	742	624	582	445	402	466

Proportion of students resident in Massachusetts

Harvard	47	44	42	40	43	43	39
Tufts	66	61	57	66	63	61	52

Number of graduates

Harvard	16	37	45	56	70	35 ¹	41 ²
Tufts	12	59	78	141	125	36 ¹	40 ²
Total	28	96	123	197	195	71	81

Classification of the total attendance

	First year	Second year	Third year	Fourth year	Total
Harvard: 1923-24	43	37	20 ¹	85	185
1924-25	88	35	36	39 ¹	198
1925-26	45	61	31	41	178
Tufts 1923-24	59	37	34 ¹	130	260
1924-25	75	55	38	36 ¹	204
1925-26	118	77	53	40	288

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

² The number of seniors (December, 1925).

facts may be inferred from the data for geographical distribution of the students given on pages 384 (Harvard) and 389 (Tufts). At each school the greatest number came from New England and the largest state groups are those from Massachusetts, Connecticut, and New York. A direct comparison of the most significant geographical data for the past two years makes the main differences more obvious.

COMPARATIVE DATA ON THE GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT HARVARD AND TUFTS: 1924-26

	Total	1924-25									
		New England	Mass.	Middle States	New York	New Jersey	Conn.	Maine	Rhode Island	New Hampshire	Vermont
Harvard	198	113	85	49	37	10	15	6	6	0	0
Tufts	204	172	124	22	15	5	17	13	8	6	4
		1925-26									
Harvard	178	104	71	43	35	6	20	6	3	2	2
Tufts	288	204	149	70	60	7	20	14	14	6	1

In a recent study of the distribution of the graduates of the Tufts Dental School and of its predecessor, the Boston Dental College, the Dean found that 1710 were engaged in active practice in New England and 1399 in Massachusetts, or respectively 34 per cent and 41 per cent of the total number of practitioners in these sections. The total number of graduates of the Harvard Dental School (1869-1925) is 1487.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the Massachusetts schools who failed, in the number of states indicated by the figures in parenthesis:

1925.—Harvard, 20.8 (5); Tufts, 19.4 (4); U. S. schools collectively, 11.3.

1910-25 (cumulative).—Harvard, 12.0 (17); Tufts, 10.3 (10); U. S. schools collectively, 14.2.

MICHIGAN

Population: 4,110,423. Number of dentists, 2063; physicians, 4837. Ratios: dentists to population, 1:1992; physicians to population, 1:850; dentists to physicians, 1:23. Statutory requirements. *Dentistry*.—Preliminary education: one year of approved work in an accredited academic college (page 396). Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from an accredited medical school, and one year of interne service in an approved hospital.

Location of the dental school: Ann Arbor; medical schools (2): Ann Arbor, and Detroit

ANN ARBOR

Population: 21,936.¹ Number of dentists, 47; physicians, 163. Ratios: dentists to population, 1:467; physicians to population, 1:135; dentists to physicians, 1:3.5

¹ The additional transient university population in 1925 was approximately 10,000 during the winter session and 350 during the summer session.

Number of dental clinics or infirmaries, 3; hospitals, sanatoriums, and charitable institutions, 5; hospitals approved for internships, 1

Dental School: University of Michigan. *Medical School*: University of Michigan

COLLEGE OF DENTAL SURGERY, UNIVERSITY OF MICHIGAN

Location: on the site of the University, in the centre of the city

General character: integral part of the University of Michigan

Organized: in 1875

Building: erected in 1908; remodeled, and new equipment extensively provided, in 1922-23; total floor area, 55,104 sq. ft. The new building of the Medical School is situated on the opposite side of the street

Infirmary: in the dental building, with thirteen accessory rooms; total floor area, 16,656 sq. ft. Total number of chairs in active use, 190, including groups reserved for special purposes: oral surgery, 3; roentgenography, 2; demonstration and examination, 1 each

Relation of the School of Medicine (Class A): all of the medico-dental subjects are taught to the dental students in separate classes, in the laboratories of the Medical School, by members of the Medical Faculty. In 1924-25, two teachers of medical subjects gave dental students instruction in clinical medicine; two teachers of dental subjects gave medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction in 1924-25: University Hospital (six blocks)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for all aspects of medicine and surgery

Number of dental internships or externships, held by officers or undergraduate students of the School, in the Hospital in 1924-25: none; dental internships held by graduate students: four

Nature and specific purpose of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: clinics in general surgery and oral surgery, which are open to dental seniors, who are required to be in attendance at the clinics for two hours weekly throughout the year; to teach modern dentistry under the conditions that prevail in a good hospital

Library (in the dental building): one reading room, 1405 sq. ft., and two fire-proof book rooms, 7105 cu. ft.; whole-time librarian. Contains 3644 bound and 1400 unbound volumes, and 675 pamphlets (all effectively card indexed). Of the volumes, practically all relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: University and Medical School Libraries; both in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: two students; total amount, \$500, of which all was provided by the School in assistantships

Dean: whole-time officer; also Professor of Dental Metallurgy and Crown and Bridge Work. *Associate Dean* (or equivalent officer): none. *Secretary*: whole-time officer; also Assistant Professor of Crown and Bridge Work

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: two years of approved work in an accredited academic college, beginning in September, 1927

The Michigan dental statute, as amended at the session of 1925, provides for the recognition, on and after September 1, 1927, of the graduates of a dental school that is conducted on the basis of either one year of work in an academic college and a four-year curriculum in dentistry (1-4 plan), or two years of work in an academic college and a three-year professional curriculum (2-3 plan). These alternatives have suggested a division of the first-year class of 1926-27 into two sections—one on the 1-4 plan, the other on the 2-3 plan. Such a division will be made, in a transitional year, before enforcement of the 2-3 plan regularly in 1927-28 and thereafter. The present opportunities for graduate work will be extended

Number of graduates (1876-1925): 2584; average per year, for fifty years, 52

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 352; proportion from Michigan: 1922-23—62 per cent; 1923-24—64 per cent; 1924-25—73 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—4000; 1921-22—4500; 1922-23—3862; 1923-24—4533; 1924-25—5466 (the figures for 1920-22 are estimates)

Number of visits, sittings, or operations: 1920-25—no available data

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-25—none. The undergraduate students witness but do not perform operations in the University Hospital

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value (dental building) of land and building, \$400,000, and equipment, \$150,000; total, \$550,000 (June 30, 1925). Practically all of the work of the first two years in dentistry, and a portion of the third, is done in the Academic College and the Medical School

General debt on the School, or carried by the University on the School's account (June 30, 1925): none. The College has always been free from debt

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$68,675	\$65,547	\$66,029	\$69,644
Fees paid by patients, in all clinical departments	20,262	21,123	27,784	29,765
Gifts ²	None	None	1,800	1,800
University funds, additional to the income designated above:				
(a) Direct appropriation ³	2,603	16,520	15,977	18,726
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	100,000	120,000	140,000	150,000
Total amount of current income	\$191,540	\$223,190	\$251,590	\$269,935

¹ Where exact figures are not available, close estimates are given throughout this statement. During the academic years 1920-24, there was no surplus, no appropriation by the State directly or by the City, and no income from endowment; no money was borrowed; and there were no miscellaneous receipts.

² An annual grant by the Research Commission of the American Dental Association. See footnote 5, on page 397.

³ All fees paid by students, and by patients in the Infirmary, are transferred to the general treasury of the University, and are not available for use by the College. The expenses of the College are covered by the general budget appropriation made directly at the beginning of each fiscal year. The "direct appropriation" in this summary, stated in conformity with the plan of uniform presentation, is the amount of the budget appropriation for dentistry that happens to exceed the income from these fees.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Total amount of current income, brought forward	\$191,540	\$223,190	\$251,590	\$269,935
Total amount of current expenditures	\$191,540	\$223,190	\$251,590	\$269,935
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	102,603	136,520	155,977	168,726
Capital expenditures (additional), by the University:				
For new construction (no land)	None	None	133,000	None
For new equipment	None	None	78,000	None
Average amount expended by the School per student (D.D.S.) per year	439	572	648	836
Average amount of all student fees paid to the School per student (D.D.S.) per year ¹	158	168	170	216
Details of current expenditures: ²				
For repairs		No available data ³		
For new equipment		No available data ⁴		
For research ⁵	4,900	4,900	6,700	6,700
For improvement of the library	1,200	1,200	1,200	1,200
For supplies used in the clinical departments	9,603	12,511	16,881	17,076
For salaries: for administration		Not distinguishable from salaries for teaching		
For salaries: for teaching	166,000	196,000	221,000	241,000
For all other purposes ⁶	9,837	8,579	5,809	3,959
Salaries for instruction:				
(Number of teachers of dental subjects)	(29)	(29)	(31)	(31)
Amount of their salaries as teachers	70,000	83,190	87,790	97,635
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	6,000	6,000	6,000	7,000 ⁷
Smallest salary paid to a whole-time teacher of a dental subject	1,800	1,800	1,800	1,800
(Number of teachers of academic or medico-dental subjects)	(36)	(36)	(36)	(36)

¹ For women the fees are \$5 less; for students non-resident in Michigan, the fees are \$50 more. From 1923 to 1925, Michigan students paid a tuition fee of \$180; non-resident students, \$260. At present (1925-26) the tuition fee for resident students is \$200.

² During the academic years 1920-24, there was no payment on account of debt or rent.

³ The University Department of Buildings and Grounds, which attends to all repairs, has not recorded the costs for the Dental School. Much equipment was replaced in 1922-23 to reduce costs of repairs and upkeep.

⁴ See "Capital expenditures," above; also footnote 3.

⁵ This total consists of an annual grant of \$1800 by the Research Commission of the American Dental Association (since 1922; \$2000 in 1925-26); also salaries for assistants and the approximate cost of supplies used in research, but does not include apportionments of the salaries of any of the professors, for each of whom study and research is a part of his regular work as a teacher. See footnote 1, page 398.

⁶ Items for which there are "no available data" are included in this total, which has been calculated by difference.

⁷ This maximum salary was paid to each of three whole-time teachers in 1923-24 and 1924-25. The whole-time members of the Dental Faculty are free to give a limited amount of time to the practice of their specialties, but the whole-time members of the Medical Faculty are not. Accordingly, the professional incomes of some of the whole-time teachers in the Dental School exceed those of the highest salaried whole-time teachers in the Medical School. In the University Hospital, which is under a separate financial management, special fees may be received by members of the Staff in excess of the amounts of the highest whole-time salaries in either the Dental School or the Medical School. The annual increase in the salaries for instruction is relatively large.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Amount of their salaries as teachers (including a proper allotment of academic, engineering, or medical salaries for the instruction of dental students) ¹	\$96,000	\$112,810	\$133,210	\$143,365
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	6,000	6,000	6,000	7,000 ²
In the Medical School	7,500	7,500	7,500	7,500
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,800	1,800	1,800	1,800
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid from the academic, engineering, or medical budget (the "allotment" referred to above) ¹	96,000	112,810	133,210	143,365

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 68. Of this total number, 18 were whole-time, none half-time, and 19 part-time or occasional teachers of academic or medico-dental subjects; 14 were whole-time, 14 half-time, and 3 part-time or occasional teachers of dental subjects; 14 were whole-time teachers in the Dental School only; 14 were "full" professors; 8 were assistant or clinical professors; none were lecturers by title; all received salaries; 23 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.A. and D.D.S.: since 1911; now seven years in length

Course for dental hygienists: since 1921; attendance: 1921-22 — 8; 1922-23 — 13; 1923-24 — 6; 1924-25 — 10

Graduate courses in dentistry: since 1894; attendance: 1921-22 — 1; 1922-23 — 3; 1923-24 — 7; 1924-25 — 5. Degrees: D.D.Sc. (1894-1918); M.S. (since 1918)

No course for dental mechanics, assistants, or technicians; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research: actively in progress in 1924-25, on focal infection — (a) a study of the clinical and bacteriological evidences of root-canal infection and its relation to systemic disease, and (b) sterilization and treatment of pulpless teeth; also on fatigue of metals in common use in prosthesis; diet and its relation to caries; numerous publications in 1924 and 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: the Dean keeps a card index of the localities in Michigan that are without dentists, which is used by members of the Faculty in efforts to place seniors immediately after their graduation

¹ These figures include expenses of research associated with teaching, which have not been separated from salaries for teaching. See footnote 5, page 397.

² This maximum salary was paid to each of three whole-time teachers in 1923-24 and 1924-25. The whole-time members of the Dental Faculty are free to give a limited amount of time to the practice of their specialties, but the whole-time members of the Medical Faculty are not. Accordingly, the professional incomes of some of the whole-time teachers in the Dental School exceed those of the highest salaried whole-time teachers in the Medical School. In the University Hospital, which is under a separate financial management, special fees may be received by members of the Staff in excess of the amounts of the highest whole-time salaries in either the Dental School or the Medical School. The annual increase in the salaries for instruction is relatively large.

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	258	350	455	390	388	349
Women.....	11	6	7	2	2	2
From other countries ; chiefly from South Africa and Canada.....	36	35	43	45	43	31
Negroes.....	1	1	3	4	3	4
Attendance at the end of the year.....	258	350	436	390	388	323
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	0	0	1	0	1	2
From other countries, to advanced standing.....	0	0	0	0	0	2
"Repeaters" of one or more subjects.....	18	37	44	42	23	27
Denied further instruction because of deficient scholarship.....	No availa	ble data				
GRADUATES (D.D.S.)						
Total number of graduates.....	83	37	58	66	113	119
Women.....	5	1	5	1	0	1
Admitted to practice in other countries.....	No availa	ble data				
Negroes.....	1	0	0	0	0	1
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	2	1	5	3	5	1
Percentages of failures in such state-board examinations.....	0	3.8	14.3	5.0	0 ¹	0

Method used by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research : personal observation, by members of the Faculty, at meetings of alumni associations, dental societies, etc., and reports from secretaries of alumni associations

Visited : March and December, 1922 ; March, 1923 ; December, 1925

The foregoing data have been verified in detail by the Dean

SUMMARY

This School is intimately associated with the Academic, Engineering, and Medical Colleges, and with the University Hospital. Generously supported financially, well equipped for all phases of its work, and having a faculty of high quality, it is one of the most happily coördinated and effectually conducted dental schools in North America, and is justly regarded generally as an exemplar of the best in dental education. Of the schools that now offer opportunity in graduate study, it was the first to encourage advanced work in dentistry. Alert to the need for scientific study of the adequacy of current methods in dental schools, the Faculty under exceptional leadership has repeatedly subjected its courses to experimental tests, and, finding them susceptible of a degree of improvement that ran counter to traditional opinions, particularly in the more effectual teaching of clinical dentistry and in the prevention of waste of time on dental technology, had the courage to apply new procedures and also the ability to ascertain their value (page 199). At the time of the first formal suggestion of the two-three-graduate plan as a constructive conclusion of the present study (March, 1924; footnote 1, page 198), the plan was more closely approximated at Michigan than at any other school.

The high quality of the Faculty is maintained by the payment of salaries that bear a reasonable relation to the needs of able teachers, and which are analogous to those in the Medical School. In 1923-24, and again in 1924-25, as examples of the salary situation, thirty-one teachers of dental subjects, including seventeen on half-time or part-time service, received \$97,635, an average of \$3150 per teacher, which is relatively high in dental schools. In 1922-23 the University expended \$211,000 for the enlargement of the

¹ Mistakenly recorded as 0.9 in the report published, in 1923, by the National Association of Dental Examiners.

building and for new equipment, but this large amount was not disbursed with the reservation that it be repaid. The full value of fees received from students and patients, and much more, is registered in direct benefits to both.

In the instruction of dental students, coördination between clinical dentistry and clinical medicine is effected by requiring the seniors to attend surgical clinics in the University Hospital, where they also have access to all of the clinics and are encouraged to exercise free election. The surgical clinics amply illustrate two parallel full-year courses of lectures and recitations in the principles of surgery and in oral surgery, and supplement and greatly strengthen the customary clinics in minor oral surgery in the dental building. The Department of Dermatology coöperates in giving thorough instruction in all of the important diseases of the mouth that come within the scope of dermatology. The facilities at the University Hospital, in all aspects of medicine, surgery, and oral surgery, are equal to the very best. Neither stomatology nor odontology is listed among the specialties named in the Announcement of the Medical School, and clinical dentistry is not given formal attention in the medical instruction, but oral surgery is taught to medical students informally, as a part of the required work in surgery in the fourth year, by the Professor of Oral Surgery in the Dental School, who is Consulting Dental Surgeon in the Medical School and in the University Hospital, and also is a member of the Medical Faculty. At

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF
 MICHIGAN : 1924-25

<i>States (12) and foreign countries (3)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Canada	4	2	3	1	10
Indiana	1	2	1	1	5
Michigan	95	64	51	42	252
New Jersey	3	1	0	2	6
New York	9	4	8	5	26 ¹
Ohio	8	3	4	1	16
Pennsylvania	2	1	0	4	7
South Africa	4	1	5	6	16
Georgia, Holland, Iowa, North Dakota, South Carolina, Utah, Vermont—one or two each	2	1	2	3	8
Total	128	79	74	65	346

Ann Arbor, as at Iowa City (page 351), although the city is small, the operative clinics in the Hospital and in the Dental Infirmary present ample opportunity for instruction in all phases of medicine and dentistry. At Ann Arbor, the clinics receive patients not only from the resident and university populations, but also in large numbers from such nearby cities as Detroit, Jackson, and Toledo, and from communities at greater distances. Many of these non-resident patients remain in Ann Arbor for prolonged periods to obtain special treatment including thorough oral health-service.

The library is not only one of the best in the number and quality of its volumes, but expert literary service by a whole-time librarian makes the bibliographic resources unusually valuable to the teachers and students. In this atmosphere the Faculty is developing graduate study on a sound basis, and research, supported by grants from the Research Commission of the American Dental Association, is steadily growing in extent and quality. One of the five sections of the International Association for Dental Research is composed solely of members of this Faculty. In 1921 the School was one of the first to require a year of approved work in an accredited academic college for admission, but, during the three years preceding, a required summer session was prefixed to the first-year curriculum (1918-20). It was the first dental school to include applied mineralogy besides metallurgy among the required courses of instruction. The course in mineralogy, given in the mineralogical lab-

¹ The number from New York at present (March, 1926) is 30.

oratory in the natural science building, is an introductory study of the properties and uses of the important inorganic substances which, as raw stuffs, are employed in the manufacture of filling materials and of the various dental appliances. It also serves admirably to stimulate keen observation and accurate visualization by the student. The properties of crystals, the occurrence and uses of minerals, and the manufacture and properties of ceramic materials as applied to dentistry are among the subjects considered, and experience is gained in the use of the polarizing microscope for the examination of plaster of Paris, porcelains, dental cements, abrasives in powders and pastes, and salts crystallizable from saliva.

Most of the students reside in Michigan. The data on page 400, for the geographical distribution of the students in 1924-25, indicate that the largest number of non-residents came from New York, and that the attendance of foreign students, especially from South Africa, was comparatively large.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of this School who failed, in the number of states indicated by the figures in parenthesis: 1925.—None (2); U. S. schools collectively, 11.3. 1910-25 (cumulative).—2.8 (20); U. S. schools collectively, 14.2.

GENERAL COMMENT

In the four surrounding states of Wisconsin, Illinois, Indiana, and Ohio, there are nine dental schools, three of which are contained in state universities. In the adjacent province of Ontario, there is one dental school. Although the total attendance of dental students at the University of Michigan decreased during 1921-25, as a result of the enforcement since 1921 of an entrance requirement of one year of approved work in an accredited academic college, each first-year class since 1921 has been larger than its predecessor and a rapid gain in total attendance is now evidently in progress. The recent service of the School to the State of Michigan is suggested by the accompanying data.

The figures for the proportion of students who reside in Michigan indicate that the School will continue to be the chief reliance of the state in dental education. The serviceability of the School to other states is shown by the foregoing data for geographical distribution. The high degree of appreciation in which the School is held by the dental profession, and by the citizens, of the State of Michigan was shown recently in a striking manner when the Faculty, proposing that the dental statute be amended to give the School freedom to adopt the two-three-graduate plan, received the endorsement of the Regents of the University, the support of the State Board of Dental Examiners, and the approval of the Legislature in the enactment referred to under "Next prospective advance," on pages 395-396.

DATA PERTAINING TO THE DENTAL SCHOOL OF THE UNIVERSITY OF MICHIGAN: 1920-26

	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Total attendance	436	390 ¹	388	323	346	393
Proportion of students resident in Michigan	65	67 ¹	62	64	73	79
First-year students	159	34 ¹	75	76	120	135
Graduates	58	66	113	119	54 ¹	76 ²
Percentage of graduates who failed in state-board examinations	14.3	5.0	0.0	0.0	0.0 ¹	...

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

² The number of seniors (December, 1925).

MINNESOTA

Population: 2,547,511. Number of dentists, 1833; physicians, 2823. Ratios: dentists to population, 1:1390; physicians to population, 1:902; dentists to physicians, 1:1.5

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a four-year high school. Professional training: graduation from a reputable dental school.

Medicine.—Preliminary education: two years of approved work in the Academic College of the University of Minnesota or the equivalent. Professional training: graduation from a "recognized" medical school.

Location of the dental school: Minneapolis; medical school: Minneapolis

MINNEAPOLIS

Population: 421,357. Number of dentists, 594; physicians, 791. Ratios: dentists to population, 1:709; physicians to population, 1:532; dentists to physicians, 1:1.3

Number of dental clinics or infirmaries, 11; hospitals, sanatoriums, and charitable institutions, 32; hospitals approved for internships, 8

Dental School: University of Minnesota. *Medical School*: University of Minnesota

ST. PAUL

Population: 244,973. Number of dentists, 303; physicians, 418. Ratios: dentists to population, 1:808; physicians to population, 1:586; dentists to physicians, 1:1.4

Number of dental clinics or infirmaries, 9; hospitals, sanatoriums, and charitable institutions, 21; hospitals approved for internships, 7

Dental school: none; medical school: none

COLLEGE OF DENTISTRY, UNIVERSITY OF MINNESOTA

Location: on the site of the University; two miles from the centre of Minneapolis, and eight miles from the centre of St. Paul

General character: integral part of the University of Minnesota

Organized: in 1888, by union of the Dental Departments of the Minnesota Hospital College (1883-88) and the St. Paul Medical College (1884-88). In 1883, a Dental Department was established in the Minnesota College Hospital, an institution affiliated with the University. In 1885, after a reorganization that involved separation of the management of the Hospital from that of the Medical College, the latter with its Dental Department was named Minnesota Hospital College

Building: erected in 1896; special improvements were made in 1912; total floor area, 32,043 sq. ft. Distance from the buildings of the Medical School, four blocks

Infirmary: in the dental building, with two accessory rooms; total floor area, 8000 sq. ft. Total number of chairs in active use, 131, including groups reserved for special purposes: prosthodontia, 13; examination and extraction, 5 each; roentgenography, 2

Relation of the School of Medicine (Class A): some of the medico-dental subjects are taught to medical and dental students together, some to dental students in separate classes, in the laboratories of the Medical School, by members of the Medical Faculty. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Dispensary and Hospitals in which dental students received accredited instruction, and performed stated clinical service, in 1922-23: Dispensary of the Medical School (five blocks), University Hospital (six blocks), and Minneapolis General Hospital (one mile). Required clinical instruction elsewhere than in the College Infirmary was discontinued in July, 1923. See the statement about an elective course in "hospital dental practice" (page 406)

Clinical facilities in the Dispensary and Hospitals where dental students received instruction in 1922-23: complete for all aspects of medicine and surgery

Number of dental internships or externships, held, by officers or students of the School, in the University Hospital in 1922-23: none

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1922-23: general surgery, oral surgery, and general medicine; to teach the relations between oral diseases and systemic conditions

Library (in the dental building): none; recently removed to the new University Library

Library facilities elsewhere than in the dental building that are conveniently accessible to dental students: University Library (new building, adjacent), where about 2500 dental volumes are separately catalogued and available in the Reading Room of the Biological Section (which also includes the Medical Library); in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: whole-time officer; also Professor of the Practice of Dentistry. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: whole-time secretary

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1920)

Next prospective advance in the minimum academic requirement for admission: two years of approved work in an accredited academic college, beginning in September, 1927

The Regents have approved the Dental Faculty's proposal to readjust the program of studies to the two-three-graduate plan. In 1926-27, a transition year, students will be admitted to the first year of the old 4-year professional curriculum or to the new 3-year curriculum, according to the character and extent of their academic preparation. The present opportunities for graduate work will be extended

Number of graduates (1889-1925): 1681; average per year, for thirty-seven years, 45. (Number for the affiliated Dental Departments, 1885-88-23; average per year, for four years, 6. During 1885-88 there were several graduates of the Dental Department of the St. Paul Medical College, but the number is unknown)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 370; proportion from Minnesota: 1922-23-91 per cent; 1923-24-83 per cent; 1924-25-85 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21-9000; 1921-22-8800; 1922-23-7800; 1923-24-7558; 1924-25-6117 (the figures for 1920-23 are estimates)

Number of visits: 1920-21-90,000; 1921-22-88,000; 1922-23-78,000; 1923-24-75,580; 1924-25-61,170 (the figures are estimates)

Number of patients treated in the Dispensary and Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-21-none; 1921-22-none; 1922-23-511. In 1923 this service was discontinued under the auspices of the Dental School; it has been continued by the Medical School, with the aid of graduate internes and externes; see "Dispensary and Hospitals," above

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value (Dental School) of land and buildings, \$138,000, and equipment, \$62,728; total, \$200,728 (September 30, 1925)

General debt on the School, or carried by the University on the School's account (September 30, 1925): none

Data for years ending on June 30	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$73,533	\$76,576	\$69,243	\$72,294
Fees paid by patients, in all clinical departments	52,042	61,292	53,907	58,925
Miscellaneous receipts	32	None	1,713	84
University funds, additional to the income designated above:				
(a) Direct appropriation	3,576	15,869	33,056	10,476
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget ²	102,139	102,139	102,139	102,139
Total amount of current income	\$231,322	\$255,876	\$260,058	\$243,918
<i>Total amount of current expenditures</i>	<i>\$231,322</i>	<i>\$255,876</i>	<i>\$260,058</i>	<i>\$243,918</i>
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above ²	105,715	118,008	135,195	112,615
Average amount expended by the school per student (D.D.S.) per year	620	682	703	657
Average amount of all student fees paid to the School per student (D.D.S.) per year	197	204	187	195
<i>Details of expenditures:</i> ³				
For repairs	1,500	750	4,001	2,574
For new equipment				
For research ⁴	None	None	None	None
For improvement of the library	150	150	150	250
For supplies used in the clinical departments	29,092	43,834	42,639	37,507
For salaries: for administration ²	28,397	28,397	27,404	26,680
For salaries: for teaching	133,338	133,338	134,207	132,177
For all other purposes	38,845	49,407	51,657	44,730
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(56)	(67)	(76)	(66)
Amount of their salaries as teachers	76,481	76,481	77,350	75,320
Number of teachers of dental subjects who did not receive salaries	(3)	(3)	(1)	(1)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	4,950	4,950	4,950	4,950

¹ During the academic years 1920-24, there was no surplus, no appropriation by the State directly or by the City, and no income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² This amount covers salaries for the instruction of dental students in other schools in the University, and "the School's proportionate share of the University's administrative expenses: those of the offices of the President, Bursar, and Comptroller, the administration of the Library, and operation in general, including cost of heat, light, gas, janitor service, laundry, etc."

³ During the academic years 1920-24, there was no expenditure on account of debt, rent, new construction, or land.

⁴ Grants by the Research Commission of the American Dental Association, for the support of dental research at the University of Minnesota (page 160), have been used privately at the Medical School.

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on June 30				
Smallest salary paid to a whole-time teacher of a dental subject	\$1,800	\$1,800	\$2,400	\$2,200
(Number of teachers of academic or medico-dental subjects)	(49)	(44)	(41)	(54)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	56,857	56,857	56,857	56,857
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	4,400	4,950	4,950	4,950
In the Medical School	5,000	6,000	6,000	6,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,600	1,800	1,800	1,800
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget but was paid by the University or from the medical budget (the "allotment" referred to above)	56,857	56,857	56,857	56,857

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 110. Of this total number, 39 were whole-time, none half-time, and 4 part-time or occasional teachers of academic or medico-dental subjects; 5 were whole-time, 3 half-time, and 59 part-time or occasional teachers of dental subjects; 5 were whole-time teachers in the Dental School only; 28 were "full" professors; 41 were associate or assistant professors; 10 were lecturers by title; 1 received no salary; 14 were teachers with degrees other than, or additional to, D.D.S., or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.A. and D.D.S.: since 1909; now seven years in length

Courses for dental mechanics: during 1920-23;¹ attendance: 1920-21—32; 1921-22—124; 1922-23—53

Courses for dental nurses (hygienists): since 1919; attendance: 1921-22—29; 1922-23—33; 1923-24—26; 1924-25—27

Graduate courses: offered since 1915—some at the Mayo Foundation (Rochester, Minnesota); attendance: 1920-25—none; degree: M.S. in Dentistry (none awarded as yet)

Advanced courses for dental practitioners: since 1917-18; attendance: 1921-22—23; 1922-23—none; 1923-24—1; 1924-25—8

Summer courses in clinical dentistry (June, July, and August): since 1913; attendance: 1922—86; 1923—54; 1924—47; 1925—65

Dental extension teaching: courses in crown and bridge work, prosthodontia, oral surgery, porcelain work, and orthodontia: since 1917; attendance: 1921-22—0; 1922-23—0; 1923-24—68; 1924-25—109. (See the "Summary," below)

Research: actively in progress in 1924-25, on physical properties of plasters and investments, alloys, waxes, and amalgams used in dentistry; relative crushing strengths of dental porcelains; relative values of different dental restorative operations; calcium metabolism in relation to the incidence of dental disease; evolution of human dentition,

¹ The courses for dental mechanics were established at the request of the United States Government, after the War, to provide a vocational training for ex-service men, who were expected to work for dentists. Situations were not available in adequate number, however, and efforts of the graduates of these courses to compete with organized dental laboratories were usually unsuccessful.

DENTAL SCHOOLS IN THE UNITED STATES

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	347	400	399	404	396	403
Women.....	6	11	8	4	4	5
From other countries; chiefly from Norway, Sweden, China, Russia, and Canada.....	5	9	3	4	6	33
Negroes.....	2	4	4	4	5	6
Attendance at the end of the year.....	324	374	373	375	370	371
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	1	3	7	5	3	0
From other countries, to advanced standing.....	0	3	0	0	1	3
"Repeaters" of one or more subjects.....	116	133	135	140	139	110
Denied further instruction because of deficient scholarship.....	4	3	3	2	2	2
GRADUATES (D.D.S.)						
Total number of graduates.....	58	61	81	99	102	78
Women.....	6	1	2	1	1	2
Admitted to practice in other countries.....	0	2	0	1	2	2
Negroes.....	2	3	1	3	5	1
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	2	3	2	4	3	1
Percentages of failures in such state-board examinations.....	1.8	6.7	5.5	8.2	1.2	10.4

and its correlation with structure and function; no publication by teachers of dental subjects in 1924 or 1925. (See footnote 4 on page 404)

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: The Big Brother Committee of the Minneapolis District Dental Society annually sends questionnaires to 600 presidents of school boards in Minnesota cities, asking for information regarding opportunities for dentists. The information is presented to the seniors in dentistry

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: May, 1922; October, 1924; February, 1925

The foregoing data have been verified in detail by the Dean

SUMMARY

THIS School has been one of the leaders in bringing about improvements in dental education and in the status of dentistry. It is closely coordinated with the Academic and Engineering Colleges, and with the Schools of Mines and Medicine. The medico-dental sciences are taught to dental students in the laboratories of the Medical School, but there is a lack of intimacy with the Medical School in the instruction in the correlations between clinical dentistry and clinical medicine. The Medical School, departing from the traditional medical inattention to oral health-service, includes in the junior year a required course in oral infections: "the typical infections of the oral cavity and their causal relations to disease (8 hours)." Instruction in oral surgery has been included informally in surgery. The Medical School also offers, "for students of medicine or dentistry, hours and credits arranged," an elective course in hospital dental practice: "practical hospital dentistry in the University Hospital, University Dispensary, and Minneapolis General Hospital, in oral surgery, periodontia, and diagnosis, giving emphasis to the systemic relationship in oral disease and its treatment." The twelve teachers of these dental courses, all of whom practise dentistry, are members of the Medical Faculty, but with several exceptions are not members of the Dental Faculty. The course in metallography, which is given at the School of Mines and represents an original effort by the Dental Faculty, is one of

the best in dental schools. It is not qualitative chemical analysis applied to a few metals, as is often the case in dental courses in "metallurgy."

The Dental School has many able teachers, but in 1924-25 only five were whole-time dental instructors. In the same year sixty-seven teachers of dental subjects, fifty-nine of whom gave part-time or occasional service, received only \$78,225 in salaries. A smaller number of teachers selected from the best, each giving ample time to the work and all of them paid adequate salaries, would assure further improvement of the instruction, particularly on the newly adopted two-three-graduate plan, which will require more intensive effort and more direct attention to the individual student. That the scholastic standards are high is suggested by the fact that, under the instruction of a faculty as competent as the one at this School, the number of students obliged to repeat one or more courses has been exceptionally large—an annual average during 1918-25 of 125 students. A pamphlet containing an outline of each of the courses in dentistry, recently prepared by the Faculty, presents a clear view of the content of the dental curriculum and will be very useful to teachers and students of dentistry.¹ The Faculty, enlarging its teaching program, has been cooperating effectually with the Director of University Extension in the development of extension courses in dentistry. In 1917, when these courses were first introduced, excessive professional fees were given to the instructors in accordance with the current practice, which also required the payment of large tuition fees by the students, but the fees for instruction have been lowered to the unit rate established in the Dental School for similar service, and tuition fees have been reduced to a minimum amount that equals the actual expenses on this basis, including a small allowance for overhead charges. A recent development of this work has been the inauguration of clinics and demonstrations in several Minnesota towns, given intensively on Friday evenings and all day on Saturdays, under the auspices of local dental societies. This service promises to cover the state. The spirit in which these improvements have been attained was indicated in the following published comment by the Director of University Extension (*Journal of Dental Research*, 1923, v, p. 273):

"It has apparently become the approved custom in the profession of dentistry for certain practitioners who have become uncommonly proficient or expert in certain lines, or who have developed a new and efficient technique or a new process of treatment, or who have invented a new instrument or a new piece of apparatus, to travel about the country holding demonstrations and clinics at which they divulge these secrets to their fellow practitioners and give them training in the practical applications. Sometimes these demonstrations and clinics are held before dental societies or conventions; at other times groups of dentists club together and thus subscribe for a course. The most notable feature of this system is that the man conducting the clinic or demonstration almost invariably charges a very high fee—high even from a professional standard—and this in spite of the fact that those who pay are fellow members of the same profession, presumably actuated by the desire to improve their skill, knowledge, and proficiency in the interest of suffering humanity. . . . In the medical profession, which is very closely related to dentistry, a practice such as that described above would be deemed wholly unethical and would not be countenanced."

In the Dental School, research has been conducted occasionally, but without special financial support. For several years research in dental relationships has been in progress in some of the laboratories in the Medical School under grants from the Research Commission of the American Dental Association (page 160). An excellent library affords stimulating opportunities for the students, and supports the work of the teachers. The School has long shown a desire to promote graduate study, but dentists have neglected the opportunity. The possibilities for advanced work in oral health-service at the Mayo Clinic

¹ *Dental Education: Outlines, Syllabi, and Bibliographies*. Prepared by the Faculty of the College of Dentistry, University of Minnesota; pp. 81; \$0.75. University of Minnesota Press; March, 1926.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF MINNESOTA : 1924-25

<i>States (11) and foreign countries (4)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Iowa	0	1	2	1	4
Minnesota	70	71	94	96	331
Montana	0	2	1	1	4
North Dakota	4	2	6	5	17
Wisconsin	4	7	4	4	19
Arkansas, Canada, China, Florida, Indiana, Nebraska, Washington— one each	1	2	3	1	7
Norway, South Dakota, Sweden—two or three each	2	1	3	2	8
Total	<u>81</u>	<u>86</u>	<u>113</u>	<u>110</u>	<u>390</u>

have also failed to appeal to them. This is perhaps the most striking direct evidence that may be cited of the prevailing lack of interest, among dentists and dental teachers, in serious graduate work (page 138). The low scholastic foundation of dental education, and the very small number of dentists who have been students in an academic college, are among the unfavorable conditions that account for this situation.

The Regents of the University have recently granted the application of the Dental Faculty for permission to proceed with the two-three-graduate plan, beginning in 1926-27. In an analysis of the prospective effect on the budget of the Dental School, it has been estimated that (1) the additional annual cost to the University of the new plan for work outside of the School would be between \$4000 and \$5000 a year. (2) If the fees for dental students and those for academic college students were left at their present level, there would be a decrease in income of practically \$12,000. The extra fees of the second pre-dental year, amounting to approximately \$6000, would exceed the additional cost estimated in (1), above. In addition, there would be a reduction in the School budget, owing to the decreased amount of instruction in strictly dental subjects, amounting to approximately \$2500. Therefore, "a fee of \$225 per year¹ in the College of Dentistry should about offset the loss due to the changes. An enrollment of 400 students in dentistry (4 × 100) at the present annual fee of \$180 per year would be equivalent to an enrollment of 300 students (3 × 100) at \$240 per year."

The data on this page, for the geographical distribution of the students in 1924-25, indicate that Wisconsin and North Dakota supplied most of those who were non-resident.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of this School who failed, in the number of states indicated by the figures in parenthesis: 1925.—18.2² (4); U. S. schools collectively, 11.3. 1910-25 (cumulative).—6.9 (11); U. S. schools collectively, 14.2.

GENERAL COMMENT

Of the four adjacent states, neither North Dakota nor South Dakota contains a dental school, but there is one each in Iowa and Wisconsin. Of the two contiguous provinces, Manitoba is without a dental school, but Ontario maintains one. Although the

¹ This would continue to be a low tuition fee. At Western Reserve, for example, the fee is \$340; at New York University it is \$400.

² The anomalous conditions affecting some of the results of license examination (page 66) are illustrated by the fact that all of the candidates who failed to pass the Minnesota Board's examination in June, 1925, were passed by the same examiners in December, 1925, although only two of the applicants had continued their dental studies, most of them meanwhile having engaged in work that was wholly unrelated to dentistry. The desirability of cooperation between the board of dental examiners and the dental faculties in any state, not only to make the license examinations more representative of the development of oral health-service but also to prevent injustice to applicants for admission to practice, was shown by the outcome of the Faculty's enquiry into this situation.

Minnesota School was the first of the members of the Dental Faculties Association of American Universities to enforce an entrance requirement of one year of approved work in an academic college, which was begun in 1920-21, the total attendance was not materially affected thereby, as may be seen from the accompanying data. The School wisely limits its attendance to the maximum number that it can effectually instruct. The number of students from foreign countries was as high as 33 in 1923-24, but has fallen to 6 in 1925-26 (December). The School's recent service to the State of Minnesota may be estimated in general from the data in the table below.

DATA PERTAINING TO THE DENTAL SCHOOL OF THE UNIVERSITY
OF MINNESOTA: 1919-26

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Total attendance	374	373 ¹	375	370	371	390	372
Proportion of students resident in Minnesota	85	88 ¹	89	91	83	85	89
First-year students	79	78 ¹	100	102	119	76	99
Graduates	61	81	99	102	78 ¹	89	119 ²
Percentage of graduates who failed in state-board examinations	6.7	5.5	8.2	1.2	10.4	18.2	...

In a special study of the distribution of dentists in Minnesota it was found by the Dean of the Dental School, in accord with the outcome of a similar enquiry affecting the distribution of physicians in the state, that the number of dental practitioners available to communities of more than 400 persons was not seriously deficient. In the conduct of this study a return post-card of enquiry was sent to the 504 post-office villages having a population of from 100 to 1000. These were canvassed to ascertain (1) the number of whole-time dentists, (2) the number of part-time dentists, (3) the number of communities having sufficient dental service, and (4) the number of villages in which dental service was inadequate. There were 454 replies—90 per cent of the total number addressed—which are summarized in the accompanying table. From the data in this table it may be seen that, in the group of villages having a population of from 400 to 499, only fourteen indicated insufficiency of dental service, while only nine asked for dental service. In general, a village having a population less than 750, unless it is situated in an exceptionally prosperous and well-settled farming community, cannot support a whole-time dentist. In the group having a population range of from

SUMMARY OF REPLIES TO A QUESTIONNAIRE ON DENTAL SERVICE IN THE STATE OF MINNESOTA³

Population range of the villages	Number that did not reply	Number of replies	Number of dentists		Sufficient service indicated	Insufficient service indicated	Dental service requested
			Resident	Part-time			
From 100 to 199	25	75	2	5	27	43	15
From 200 to 399	17	195	19	44	68	110	67
From 400 to 499	3	47	29	10	33	14	9
From 500 to 749	3	79	57	6	68	11	7
From 750 to 999	2	58	47	2	51	1	2
Total	50	454	154	67	247	179	100
Reliability of the replies:							
Doubtful		0	0	0	0	4	18
Certain		454	154	67	247	175	82

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

² The number of seniors (December, 1926).

³ Owre: *Journal of the American Medical Association*, 1923, lxxxi, p. 681.

750 to 1000, only one town indicated insufficient service. In the smaller villages, increased part-time service of dentists, or visits of patients to dentists in neighboring towns, are among the conditions that favor adequate oral health-service under present conditions (page 87). As a rule, dental disorders are not sufficiently disabling in their effects to prevent the rural patient from visiting a practitioner in the nearest town. The telephone, and good roads and the automobile, facilitate communication and transportation in emergencies.

MISSISSIPPI

Population: 1,790,618.¹ Number of dentists, 387; physicians, 1702. Ratios: dentists to population, 1:4627; physicians to population, 1:1052; dentists to physicians, 1:4.4
 Statutory requirements. *Dentistry*.—Preliminary education: graduation from a high school or its equivalent. Professional training: graduation from a reputable dental school. *Medicine*. Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A or Class B medical school

Dental school: none; medical school: University of Mississippi (gives only the first two years of a four-year curriculum)

MISSOURI

Population: 3,461,078. Number of dentists, 2120; physicians, 5806. Ratios: dentists to population, 1:1633; physicians to population, 1:596; dentists to physicians, 1:2.7

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited high school or the equivalent. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: graduation from an accredited high school or the equivalent. Professional training: graduation from a reputable medical school

Location of the dental schools (3): Kansas City, and St. Louis (2); medical schools (6) Columbia,² Kansas City (2), and St. Louis (3)

KANSAS CITY

Population: 363,565. Number of dentists, 427; physicians, 1002. Ratios: dentists to population, 1:851; physicians to population, 1:363; dentists to physicians, 1:2.3
 Number of dental clinics or infirmaries, 5; hospitals, sanatoriums, and charitable institutions, 29; hospitals approved for internships, 5

Dental School: Kansas City-Western Dental College. *Medical Schools* (2): Kansas City College of Medicine and Surgery, and Kansas City University of Physicians and Surgeons

¹ The figure for population was that of the census of 1920, when the total was less than in 1910. It is the policy of the Bureau of the Census to withhold estimates of population where increase is not shown between actual enumerations. See footnote 2, page 258.

² Gives only the first two years of a four-year curriculum.

KANSAS CITY (KANSAS)

Population: 115,949. Number of dentists, 64; physicians, 171. Ratios: dentists to population, 1:1812; physicians to population, 1:678; dentists to physicians, 1:2.7

Number of dental clinics or infirmaries, none; hospitals, sanatoriums, and charitable institutions, 7; hospitals approved for internships, 2

Dental School: none. *Medical School*: University of Kansas (Lawrence and Rosedale)

KANSAS CITY—WESTERN DENTAL COLLEGE

Location: Tenth Street and Troost Avenue; one mile from the centre of the city

General character: independent. Non-proprietary since May 18, 1923, the owning stock company having been dissolved and the equipment conveyed to a new corporation, which was organized under the laws of Missouri and on a charter which provides that all income shall be expended in the interest of the College as an educational institution

Organized: in 1919, by amalgamation of the Kansas City Dental College (1890–1919) and the Western Dental College (1890–1919), and located in the building of the former on the northwest corner of Tenth Street and Troost Avenue. The Kansas City Dental College was originally the Dental Department of the Kansas City Medical College (1881–90), but became independent in 1890

Buildings: two. The building in which the College was located until 1923 was erected in 1910. This building was reconstructed during the summer of 1923 and now contains the executive offices, a library, and laboratories for instruction in some of the subjects of the first and second years; floor area, 16,432 sq. ft. A three-story steel and concrete building, directly across the street, was erected during the spring and summer of 1923. This building, which was made strong enough to support four additional stories, contains a large infirmary and accessory rooms; also laboratories and lecture rooms for instruction in chemistry, histology, bacteriology, and dental technology; floor area, 28,900 sq. ft. Total floor area used by the School in both buildings, 45,332 sq. ft.

Infirmary: in the new building, with nine accessory rooms; total floor area, 11,800 sq. ft. Total number of chairs in active use, 115, including groups reserved for special purposes: prosthodontia, 15; root-canal operations, 8; extraction, 5; examination and orthodontia, 2, each; diagnosis, oral surgery, and roentgenography, 1, each. About 75 public school children are given treatment daily five days a week—approximately 12,000 in 1924–25. The children are carefully selected by school nurses, and taken to the College and returned to the schools under supervision. This public service has been in progress since 1919; it is given without charge including the supplies, except for the gold that may be used

School of Medicine: associated with none

Hospitals in which dental students received accredited instruction, or performed stated clinical service, in 1924–25: St. Luke's Hospital (three miles), and Kansas City General Hospital (one mile). The School has no affiliations with the Deaner Dental Institute (page 416)

Clinical facilities in the Hospitals where dental students received instruction in 1924–25: complete for all aspects of medicine and surgery

Number of dental internships or externships, held by officers or students of the School, in the Hospitals in 1924–25: none

Nature and specific purpose of the accredited clinical instruction given elsewhere than in the dental building, in 1924–25: oral surgery, one morning a week at either Hospital, by the Professor of Oral Surgery; to a group of about fifteen seniors

Library (old building): room, 678 sq. ft.; no librarian. Contains 700 bound and 50 unbound

volumes, and no pamphlets (not card indexed). Of the volumes, approximately 675 relate to dental subjects

Library facilities additional to those in the old dental building that are conveniently accessible to dental students: Public Library (five blocks); in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: whole-time officer; does not hold a professorship. *Associate Dean* (or equivalent officer): the Secretary-treasurer; whole-time officer, also Professor of Crown and Bridge Work

Minimum academic requirement for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (15 units), or its equivalent (since 1915)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

The School will lengthen its curriculum to five years, the first of which will be devoted to academic subjects, including several courses to test vocational aptitude. Students who have completed the equivalent of one year of approved work in an accredited academic college will be admissible to the second year of the five-year curriculum. Qualified students will receive the B.S. degree at the end of the fourth year, D.D.S. at the end of the fifth year

Number of graduates (1920-25): 383; average per year, for six years, 64. (Number for Kansas City Dental College, 1883-1919—1148; average per year, for thirty-seven years, 31. Number for Western Dental College, 1891-1919—1254; average per year, for twenty-nine years, 43)

Average total attendance, per year (at the end of the year), for the past six years (1920-25): 333; proportion from Missouri: 1922-23—34 per cent; 1923-24—36 per cent; 1924-25—37 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—8000; 1921-22—10,000; 1922-23—14,946; 1923-24—23,800; 1924-25—23,316 (the figures for 1920-22 and 1923-24 are estimates)

Number of visits: 1920-21—27,000; 1921-22—32,500; 1922-23—44,820; 1923-24—71,582; 1924-25—92,364 (the figures for 1920-22 are estimates)

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-25—no available data

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (1920), Class B

FINANCIAL DATA

Estimated value of land and buildings, \$210,000, and equipment, \$102,270; total, \$312,270 (February 1, 1925). The corporation owns the equipment only

General debt on the College (July 1, 1925): \$22,400 at 6 per cent interest per annum

Accumulated net assets (July 1, 1925): \$85,319

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$48,980	\$58,825	\$72,030	\$89,739
Fees paid by patients, in all clinical departments	24,875	27,206	41,825	54,869
Miscellaneous receipts	818	767	1,006	7,861
Total amount of current income	\$74,673	\$86,798	\$114,861	\$152,469

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment, investment, or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Total amount of current income, brought forward	\$74,673	\$86,798	\$114,861	\$152,469
Total amount of current expenditures	\$48,043	\$65,711	\$81,891	\$119,199
Net income for the year	26,630	21,087	32,970	33,270
Dividend ¹	24,000	27,520	10,000	... ²
<i>Capital expenditures:</i>				
For reduction in principal of debt	\$4,500	None	\$7,200	\$12,700
For new equipment	3,202	\$1,196	3,912	34,559
For new construction (or land)	None	None	None	None
For improvement of the library	None	None	500	None
Total	\$7,702	\$1,196	\$11,162	\$47,259
Accumulated surplus, at the end of the year	None	None	16,691	49,961
Average amount expended by the School per student (D.D.S.) per year	170	212	224	303
Average amount of all student fees paid to the School per student (D.D.S.) per year	174	190	197	228
<i>Details of current expenditures:</i>				
For interest on debt	87	None	36	3,891
For rent	2,400 ³	3,600 ³	3,800 ³	15,040 ⁴
For repairs	895	2,728	1,456	1,559
For research	None	None	None	None
For supplies used in the clinical departments	6,772	8,228	9,703	16,436
For salaries: for administration	8,500	8,500	9,733	9,800
For salaries: for teaching	17,630	20,318	25,065	25,472
For all other purposes	11,759	22,337	32,098	47,001
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(20)	(19)	(20)	(18)
Amount of their salaries as teachers	14,635	16,573	21,065	21,743
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	3,600	3,600	3,600	3,600
Smallest salary paid to a whole-time teacher of a dental subject	1,800	1,800	2,400	2,400
(Number of teachers of academic or medico-dental subjects)	(12)	(14)	(14)	(16)
Amount of their salaries as teachers	2,995	3,745	4,000	3,729
Largest salary paid to a whole-time teacher of an academic or medico-dental subject		(No whole-time teacher in these subjects)		2,400 ⁵

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 36.⁶ Of this total number, 1 was a whole-time, 1 a half-time, and 14 were part-time or occasional teachers of academic

¹ The dividends were paid on 360 shares (par value \$100 each).

² Non-proprietary since May 18, 1923.

³ The building was owned by a stockholder.

⁴ The buildings are owned by trustees individually.

⁵ There was one whole-time teacher of academic subjects in 1923-24, who gave instruction in chemistry and physics; he continued in 1924-25 as the whole-time teacher of these subjects.

⁶ In addition, there were 15 assistant demonstrators of anatomy, all of whom were physicians or dentists.

or medico-dental subjects; 6 were whole-time, 5 half-time, and 9 part-time or occasional teachers of dental subjects; 20 were "full" professors; 4 were associate professors; none were lecturers by title; all received salaries; 17 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

STUDENTS AND GRADUATES: KANSAS CITY-WESTERN DENTAL COLLEGE

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	Year before	254	294	335	384	424
Women.....	the	0	0	0	0	0
From other countries; chiefly from Japan and China	amalgamation	2	3	3	5	1
Negroes.....	of the	0	0	0	0	0
Attendance at the end of the year.....	two	230	282	310	366	394
Admitted after examination.....	colleges	9	5	8	8	4
Admitted to advanced standing.....	...	7	7	4	24	28
From other countries, to advanced standing.....	...	0	0	0	3	2
"Repeaters" of one or more subjects.....	...	12	8	11	14	9
Denied further instruction because of deficient scholarship.....	...	4	5	8	8	10
GRADUATES (D.D.S.)						
Total number of graduates.....	...	22	48	61	92	69
Women.....	...	0	0	0	0	0
Admitted to practice in other countries.....	...	No availa	ble data			
Negroes.....	...	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	...	3	6	7	7	8
Percentages of failures in such state-board examinations.....	...	0	4.5	1.8	2.7	3.0

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research: none in progress in 1924-25; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: May, 1922; May, 1924

The foregoing data have been verified in detail by the Secretary-treasurer

SUMMARY

ALTHOUGH this School has recently been reincorporated as a non-proprietary institution, housed in a new building, and greatly improved in equipment, its trustees appreciate the fact that it cannot be continued to public advantage independently, and are endeavoring to make it an integral part of the Lincoln and Lee University of Kansas City. This new university is being organized by a committee of which the active executive officer of the School is a member. He is also one of its Trustees. The University, which was chartered on January 12, 1926, will occupy a site of about 262 acres of land between 75th and 83d Streets on the line between Missouri and Kansas, six miles from the present location of the Dental School. The School's lack of intimate medical relationships is an embarrassment in the effort to make its work deserving of complete public approval. The special service performed for large numbers of public school children is an important contribution to community welfare, and is also very valuable to the School in the opportunity it affords

GEOGRAPHICAL DISTRIBUTION OF THE STUDENTS AT THE KANSAS CITY-WESTERN DENTAL
COLLEGE: 1924-26

1924-25					
<i>States (20) and foreign countries (2)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Arkansas	3	1	2	1	7
Illinois	2	0	0	10	12
Iowa	2	2	1	5	10
Kansas	26	44	35	40	145
Missouri	48	41	38	35	162
Nebraska	1	1	8	9	19
Oklahoma	12	15	7	7	41
South Dakota	2	1	1	1	5
Texas	1	0	3	3	7
Washington	2	2	1	0	5
California, Canada, China, Colorado, Michigan, Montana, New Mexico, Oregon, Wyoming — one or two each	5	1	2	3	11
Idaho, Minnesota, Utah — three or four each	3	4	3	1	11
Total	<u>107</u>	<u>112</u>	<u>101</u>	<u>115</u>	<u>435</u>

1925-26					
<i>States (21), territory (1), and foreign countries (3)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Arkansas	3	1	1	1	6
Iowa	1	2	1	5	9
Kansas	23	33	45	36	137
Missouri	45	36	38	40	159
Nebraska	0	1	8	3	12
Oklahoma	12	10	6	7	35
South Dakota	2	1	1	1	5
Texas	1	0	3	1	5
California, Canada, Colorado, Georgia, Ha- waiian Islands, Japan, Java, Michigan, Mon- tana, New Mexico, Oregon, Wyoming — one or two each	5	3	2	4	14
Idaho, Illinois, Minnesota, Utah, Washington — three or four each	6	4	4	3	17
Totals	<u>98</u>	<u>91</u>	<u>109</u>	<u>101</u>	<u>399</u>

to teach the students the types and conditions of preventive and remedial dental practice for children. This service suggests the greater degree of usefulness to the city that the School might attain as a part of the University, if it were closely coordinated with a good medical school, hospital, and dispensary, and given effectual educational guidance and adequate financial support.

The School is parsimonious in its expenditures for teaching, lacks an adequate library, restricts its attention to the undergraduate curriculum, and is passive in research. In 1924-25, it had seven whole-time, six half-time, and twenty-three part-time teachers, twenty-four of whom were "professors." Although all received remuneration, the maximum whole-time salary was \$4200 and the average salary was less than \$1000, yet \$9800 was expended in salaries for administration, \$22,355 was paid to trustees for rent for the use of their buildings (a large proportion of which was used to pay the interest and a portion of the principal of a first mortgage of \$100,000), and the profit for the year was \$35,000. In 1920-21, the average amount expended by the School per student was \$4 less than the average amount of the fees paid by him. In 1924-25, the difference was only \$77 more

per student than the average amount of his fees. During the past three years seventy-two students — an exceptional number — have been admitted to advanced standing. The lengthened curriculum will increase the income, but well-advised students will prefer to complete their preparatory education in a good academic college (page 278). The data for the geographical distribution of the students, in 1924-25 and in 1925-26 (page 415), show that most of them came from Missouri, Kansas, and Oklahoma. During the past three years the total attendance has been stationary. Comparative data relating to students, graduates, and results of license examinations, are given on pages 429-430.

DEANER DENTAL INSTITUTE¹

The Kansas City-Western Dental College and the Deaner Dental Institute have not been affiliated. The Institute was chartered in 1921 as a philanthropic agency for dental "group practice" and for research in dentistry. It is conducted by a self-perpetuating board of six trustees, all of whom are notably public spirited. It was believed that the net income from the practice would provide a surplus for research, but the Institute has been operated at a financial loss. In 1924 the Institute occupied a fine new four-story brick building¹ which, representing an expenditure of \$400,000, contains 109 rooms (35,000 sq. ft.) and is unusually well equipped for all of the Institute's purposes. The fourth floor has been reserved for medico-dental research and for a hospital of 18 beds. Rooms for animals used in research and a chemical laboratory are located on the roof. Although the hospital has not been developed, all of these departments of the Institute are now in operation: diagnosis, orthodontia, preventive dentistry, fixed restorations, removable restorations, exodontia, oral surgery, and research. There are 13 dentists, 1 dental hygienist, and 12 operative and laboratory assistants in active service. From the opening of the Institute, on September 1, 1921, to February 1, 1926, a total of 7880 patients were registered for diagnosis and treatment. For the varied work in preventive dentistry there is a department of nutrition, a children's clinic, and a large play-room in which elementary instruction is given in nutrition and oral hygiene. From September 15, 1925, to February 1, 1926, approximately 3000 children from the public schools have been given oral health-service at the uniform rate of fifty cents a visit, and 417 free of charge. At present about 40 children receive attention daily. Research has been directed particularly to the study of technical problems, correlations between the clinical phases of dentistry and medicine, and nutrition in its relation to oral health; and the results have been freely published. Members of the staff give lectures at the Institute to children, parents, and practitioners, and also at public schools, at meetings of dental and parent-teacher associations and of various social organizations, and at dental and medical institutions.

An advance of national importance might be made in dental education, if the Deaner Dental Institute were given an endowment large enough to enable it not only to continue its group practice, its efforts to promote community oral hygiene, and the development of its hospital service, but also to enlarge the scope of its research and to give graduate instruction of the highest quality. Without an endowment the Institute, even on its present program, may not be able to continue. Union between the Kansas City-Western Dental College and the Deaner Dental Institute, the former giving attention primarily to the training of general practitioners, the latter to the education of specialists — the undergraduate and graduate departments, respectively, of a greater dental school — would notably strengthen the work and enhance the public usefulness of each. Ultimate coördination of this prospective dental health union with a first class medical school, hospital, and dispensary, in Lincoln and Lee University, would give Kansas City unusual facilities and influence in the field of oral health-service.

¹ Located at 105 Hunter Avenue, three miles from the Dental School.

ST. LOUIS

Population: 817,120. Number of dentists, 739; physicians, 1861. Ratios: dentists to population, 1:1106; physicians to population, 1:439; dentists to physicians, 1:2.5
 Number of dental clinics or infirmaries, 9; hospitals, sanatoriums, and charitable institutions, 47; hospitals approved for internships, 9

Dental Schools: (1) Washington University, (2) St. Louis University. *Medical Schools* (3): St. Louis University, Washington University, and St. Louis College of Physicians and Surgeons

(1) SCHOOL OF DENTISTRY, WASHINGTON UNIVERSITY

Location: Twenty-ninth and Locust Streets; two miles from the centre of the city

General character: integral part of Washington University

Organized: in 1892, by absorption of the Missouri Dental College, which had been established in 1866 pursuant to action taken by the Missouri State Dental Society. Until 1900 the Missouri Dental College was administered in close association with the St. Louis Medical College, which, in 1891, became the Medical Department of Washington University. The original name of the College was formally retained until 1918

Building: erected in 1886; occupied since 1909; total floor area, 20,000 sq. ft. Distance from the main site of the University, four miles; from the Medical School, three miles

Infirmary: in the dental building, with three accessory rooms; total floor area, 4000 sq. ft. Total number of chairs in active use, 38, including groups reserved for special purposes: extraction, 2; prosthodontia, 2; roentgenography, 1

Relation of the School of Medicine (Class A): during 1922-25, all of the medico-dental subjects were taught in the laboratories of the Medical School. Anatomy, histology, and physiology were taught to the dental students in separate groups; bacteriology, biological chemistry, and pathology were taught to the medical and dental students in the same classes. At present (1925-26), all of the medico-dental subjects are taught to dental students in the dental building, and oral surgery at the Medical School, by members of the Medical and Dental Faculties.¹ In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction, in 1924-25: Barnes Hospital (on the site of the Medical School)

Clinical facilities in the Hospital where dental students received instruction, in 1924-25: complete for all phases of medicine and surgery

Number of dental externships (no internships), held by officers of the School, in the Hospital in 1924-25: four

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: oral surgery; to teach the principles of general surgery applied to dentistry

Library (in the clinical building): room, 432 sq. ft.; part-time librarian. Contains 2900 bound and no unbound volumes, and 1400 pamphlets (not effectively card indexed). Of the volumes, practically all relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: none

¹ Dental students are now receiving (1925-26) instruction in inorganic chemistry at the Academic College; distance from the dental building, four miles. See "Minimum academic requirement," page 418.

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: part-time officer; also Professor of Prosthetic Dentistry. Associate Dean: none. Secretary of the Faculty and Assistant to the Dean: whole-time officer; also Professor of Materia Medica, Metallurgy, Dental Pathology, Therapeutics, and Roentgenology

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

In 1925, the School receded to graduation from an accredited high school (15 units) as the minimum requirement for admission. There was an immediate increase in attendance (page 422)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

The School will lengthen its curriculum to five years, the first of which will include several dental subjects. Students who have completed one year of approved work in an accredited academic college will be admissible to the second year of the five-year curriculum, with conditions in the dental subjects of the first year. Provision will be made to facilitate the removal of any such conditions before the end of the second year. It has not yet been determined whether any degree other than D.D.S. will be awarded

Number of graduates (1893-1925): 1001; average per year, for thirty-three years, 30. (Number for the Missouri Dental College, 1867-92—239; average per year, for twenty-six years, 9)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 89; proportion from Missouri in 1922-23—44 per cent; 1923-24—44 per cent; 1924-25—37 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—10,000; 1921-22—10,000; 1922-23—11,481; 1923-24—10,738; 1924-25—3251 (the figures for 1920-22 are estimates)

Number of visits, sittings, or operations: 1920-25—no available data

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-23—no affiliations; 1923-25—none

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$71,146, and equipment, \$24,641; total, \$95,787 (June 30, 1925)

General debt on the School (June 30, 1925): none

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$16,527	\$13,773	\$11,755	\$10,273
Fees paid by patients, in all clinical departments	10,565	9,130	13,203	11,987
University funds, additional to the income designated above:				
(a) Direct appropriation	25,155	21,828	21,745	19,739
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	3,500	3,500	3,500	3,500
Total amount of current income	\$55,747	\$48,231	\$50,203	\$45,499

¹ During the academic years 1920-24, there was no surplus, no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Total amount of current income, brought forward</i>	\$55,747	\$48,231	\$50,203	\$45,499
<i>Total amount of current expenditures</i>	\$55,747	\$48,231	\$50,203	\$45,499
Amount expended for the School by the University, in excess of dental income and included in "University funds," above	28,655	25,328	25,245	23,239
Average amount expended by the School per student (D.D.S.) per year	541	595	707	892
Average amount of all student fees paid to the School per student (D.D.S.) per year	160	170	166	201
<i>Details of expenditures:</i> ¹				
For repairs	1,351	500	350	1,262
For new equipment	12,300	1,190	585	1,004
For research	None	None	None	None
For improvement of the library	21	200	200	55
For supplies used in the clinical departments	4,040	4,040	5,020	5,977
For salaries: for administration	5,620	5,620	2,920	2,920
For salaries: for teaching	28,386	31,850	26,710	28,950
For all other purposes	4,029	4,831	14,418	5,331
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(18)	(18)	(18)	(18)
Amount of their salaries as teachers	16,186	19,650	14,510	16,750
Number of teachers of dental subjects who did not receive salaries	(3)	(2)	(2)	(3)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	4,200	3,700	4,200	4,200
Smallest salary paid to a whole-time teacher of a dental subject	2,400	2,400	2,400	1,800
(Number of teachers of academic or medico-dental subjects)	(6)	(5)	(11)	(11)
Amount of their salaries as teachers (including a proper allotment of university, academic, or medical salaries for the instruction of dental students)	12,200	12,200	12,200	12,200
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	(No whole-time teacher of such a subject in the Dental School)			
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the budgets of the College of Liberal Arts (1920-22) or the School of Medicine (1922-24), the "allotment" referred to above	3,500	3,500	3,500	3,500

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 27. Of this total number, 8 were whole-time, none half-time, and 1 was a part-time or occasional teacher of academic or medico-dental subjects; 3 were whole-time, 2 half-time, and 13 part-time or occasional teachers of dental subjects; 3 were whole-time teachers in the Dental School

¹ During the academic years 1920-24, there was no payment on account of debt, rent, new construction, or land. During 1920-22, the University appropriated \$9000 from general funds to the credit of the Dental School and charged the same amount against the School as rental for the building.

STUDENTS AND GRADUATES: SCHOOL OF DENTISTRY, WASHINGTON UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	86	79	103	81	73	52
Women.....	1	2	3	3	2	2
From other countries.....	1	0	1	0	0	2
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	83	79	103	81	71	51
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	0	1	3	0	4	2
From other countries, to advanced standing.....	0	0	0	0	0	2
"Repeaters" of one or more subjects.....	0	0	0	0	0	0
Denied further instruction because of deficient scholarship.....	0	0	0	0	1	0
GRADUATES (D.D.S.)						
Total number of graduates.....	51	3	14	18	28	31
Women.....	0	0	0	1	2	0
Admitted to practice in other countries.....	0	0	0	1	2	2
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	3	1	4	1	2	2
Percentages of failures in such state-board examinations.....	4.0	0	7.7	0	3.7	7.1

only; 8 were "full" professors; 1 was an associate professor; 4 were lecturers by title; 3 received no salaries; 11 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Advanced courses for dental practitioners: since 1924, in orthodontia; attendance: 1924-25—3

Summer courses in clinical dentistry (June, July, August, and September): since 1893 (except 1920-22); attendance: 1923—13; 1924—6; 1925—5

No combined curricula leading to the degrees of B.S. or B.A., and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no dental extension teaching

Research: none in progress in 1924-25; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: November, 1921; May, 1922; January, 1923; June, 1924

The foregoing data have been verified in detail by the Secretary

SUMMARY

IN 1921 all of the schools represented in the Dental Faculties Association of American Universities except that of the University of California, after years of earnest advocacy of progressive educational standards, began to enforce an entrance requirement of one year of approved work in an accredited academic college. The Dental School of Washington University, a member of the Association, was one of the most active in urging adoption of the higher requirement as an essential step toward dentistry's attainment of service equivalence with medicine, and endorsed the view of the founders of the Association that instruction in dentistry should be restricted to schools in universities. At that time, however, the School was receiving so little attention from the University and so little cooperation from the Medical School that defenders of the proprietary dental school used it effectively

not only as evidence of the fact that a university relationship does not necessarily impart educational excellence to a school, but also as support for the contention that an inferior university school may be less useful than a well-managed independent college (page 105). The contrast between the generous endowment of the Medical School, one of the best in the United States, and the lack of endowment of the Dental School illustrated the great inequality that then prevailed, and which persists, in most of the universities having medical and dental schools.

In 1922-23 the instruction in the medico-dental sciences, which had become ineffectual at this School, was transferred to the Medical School, in accordance with the policy at nearly all of the schools then represented in the Dental Faculties Association of American Universities. This improvement was intended by the University to initiate the development of an intimate relationship between the Medical and Dental Schools, and included a prospective new building on the grounds of the Medical School. In three subjects the medical and dental students received instruction together. In the fall of 1925, however, the entire plan was abandoned, and now the work in the medical sciences, continued under the general supervision of the medical departments and by teachers of their selection, is conducted in the dental building, which has long been poorly adapted to the needs of the School, and where the facilities are markedly inferior to those in the medical buildings. This isolation of the Dental School, contrary to the general trend in the universities, exemplifies recent suggestions by the University's medical advisers that close coordination of the Dental School with the Medical School, Hospital, and Dispensary, is "neither necessary nor desirable."

Although the affiliation with the Medical School during 1922-25 greatly improved the work of the Dental School, the total attendance of dental students continued to decrease steadily from 1921-22 until 1924-25, when it fell to 38 — less than an average of 10 per class. Unlike the stronger schools that in 1921 began to enforce an entrance requirement of one year of work in an academic college, the School did not make important recoveries of its losses in attendance. "In order to increase the student body to a size sufficient to warrant the maintenance of the School" and to reduce the financial burden on the University, which for several years had been ranging between \$20,000 and \$25,000 annually, the minimum entrance requirement for the year 1925-26 was lowered to graduation from a high school, thus equalizing it with that of "the two Missouri competitors." Under these conditions, at a time when the number of schools on the lower entrance requirement was decreasing, and students who sought the easiest routes to the professional degree were accepting their last opportunities to attain it in four years after graduation from a high school, a first-year class of 61, and about 30 students who were admitted to advanced standing, increased the total attendance to 120 — an average of 30 per class (February, 1926). The effect on the attendance of Missourians and of non-resident students, at the three schools in this state, may be noted from the data in the table on page 430.

The Dental School of Washington University is the only one in North America, which, after enforcing an entrance requirement of at least one year of approved work in an accredited academic college (1921-25), avowedly to advance dental education, returned for financial reasons to a lower requirement. A reversal of this kind in a proprietary school would not be remarkable, but it is regrettable that inability to obtain the necessary funds compelled a great university, which has accumulated an endowment of over \$4,000,000 for medical education, to resort to this expedient to keep its Dental School alive. Washington University will be unable to raise the Dental School to the rank in dentistry that its Medical School has attained in medicine, and to make the School influential through merit, unless dental education is conducted with the sympathy and attention that are notably manifested in behalf of medical education. In 1924-25, eighteen teachers of dental subjects, three giving whole-time service, received salaries amounting to only \$16,250; and of the three whole-time teachers, one, the Secretary of the School, who also performed

DENTAL SCHOOLS IN THE UNITED STATES

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT WASHINGTON UNIVERSITY: 1924-26

1924-25					
<i>States (7) and foreign countries (2)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Arkansas	1	0	2	0	3
Illinois	6	3	0	4	13
Missouri	4	4	5	1	14
Oklahoma	1	0	0	1	2
British Columbia, Greece, Kansas, Mississippi, Texas—one or two each	4	0	1	1	6
Total	16	7	8	7	38
1925-26					
<i>States (11), territory (1), and foreign countries (3)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Arkansas	4	1	0	2	7
Illinois	26	16	4	6	52
Missouri	24	9	5	5	43
Oklahoma	2	1	0	0	3
Canada, El Salvador, Indiana, Japan, Kansas, Mississippi, Nebraska, Ohio, Oregon, Porto Rico, Texas—one or two each	5	2	0	8	15
Total	61	29	9	21	120

administrative duties in assistance to a part-time Dean, was Professor of *Materia Medica*, *Metallurgy*, *Dental Pathology*, *Therapeutics*, and *Roentgenology*. Four years ago he taught chemistry, *materia medica*, metallurgy, pathology, and therapeutics. It is not surprising that under such conditions, which would be considered superficial for the Medical School, the instruction in the correlations between clinical dentistry and clinical medicine has not been strong, the hospital relationship does not afford opportunity for clinical practice by the dental student, the Faculty confines its attention almost entirely to the undergraduate curriculum, the library is inactive, and research has not received financial support.

The accompanying table shows the geographical distribution of the students in 1924-25, when the School required one year of approved work in an accredited academic college for admission; also in 1925-26, after the School lowered its minimum entrance requirement to graduation from a high school. The data indicate that most of the students in each year came from Illinois and Missouri, that the lowered standard was most attractive in Illinois, and that the largest number of the students admitted to advanced standing under the new conditions were received from these two states. Comparative data relating to students, graduates, and results of license examinations, are tabulated on pages 429-430.

The Announcement of the Medical School for 1925-26 gives no indication of any active interest in the instruction of medical students in oral health-service, although the conventional medical specialties receive the usual attention. Since its publication, a required lecture course in stomatology,¹ by the Professor of Stomatology in the Dental School, has been added to the medical curriculum. There are two dentists in the medical division and another in the surgical division of the affiliated Barnes Hospital; two dentists and a stomatologist on the staff of the affiliated St. Louis Children's Hospital; two dentists on the staff of the University Dispensary; and a stomatologist, by nomination of the University, on the staff of the St. Louis City Hospital. None of these clinical officers except the Lecturer in Stomatology is named in the register of teachers of medical students, but two are members of the Faculty of the Dental School. One of the associate professors of clinical surgery in the Medical School is Professor of Oral Surgery in the Dental School.

¹ On page 112 of the Announcement of the Medical School for 1926-27, this course is listed, with four others, under the heading, "Miscellaneous courses," and described as follows: "Stomatology. — Lectures and demonstrations. The relation between stomatology and the other branches of medicine is considered. Third semester, third year; 7 hours." The lecturer, although a physician, is not a member of the staff of the Department of Surgery.

Oral health-service in North America would be advanced immeasurably if Washington University planned to coordinate the Dental School intimately with the Medical School, Hospital, and Dispensary, and received funds sufficient for the support of an exceptional faculty, the erection of the necessary new building, the provision of suitable equipment, and the maintenance of adequate endowment. Having this broad purpose, these added resources, and the ensuing new opportunities, with eminent leadership, inspiring teaching, and the quickening influence of graduate work and active research, this School, then deservedly attracting discerning students from all parts of the country, would become a national influence for the promotion of the public welfare in a service of universal concern.

(2) SCHOOL OF DENTISTRY, ST. LOUIS UNIVERSITY

Location: 3556 Caroline Street; one mile from the centre of the city

General character: integral part of St. Louis University

Organized: in 1908, by absorption of the St. Louis Dental College (1905-08). The Dental Department of the Marion-Sims College of Medicine (St. Louis) was established in 1894. In 1900, when the Marion-Sims College of Medicine and the Beaumont Hospital Medical College were consolidated, the Dental Department was incorporated as the Marion-Sims Dental College, a private institution. In 1903, when St. Louis University acquired the Marion-Sims Beaumont Medical College and established it as the Medical Department of the University, the Marion-Sims Dental College became the Dental Department of the University, though it continued as a proprietary school. In 1905, the Dental College was leased from the stockholders by the University, which in 1908 acquired title by purchase, when the Dental College became an integral part of the University

Building: erected in 1922, adjacent to the medical buildings; total floor area, 30,000 sq. ft. (see next item below). Situated one-half mile from the main site of the University

Infirmary: in the dental building, with six accessory rooms; total floor area, 10,000 sq. ft. Total number of chairs in active use, 105, including groups reserved for special purposes: examination, and extraction, 2 each; treatment of members of the Faculty, 2; roentgenography, 1

Relation of the School of Medicine (Class A): all of the medico-dental subjects are taught in the laboratories of the Medical School, to dental students in separate classes, by members of the Medical Faculty. About 12,000 sq. ft. of floor area in the medical buildings are used exclusively for the instruction of dental students. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry. The Deans of the Dental and Medical Schools are members of the Administrative Board of each School, and the Regent represents the President of the University in both schools

Dispensaries and Hospitals in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: Convent of the Good Shepherd (three miles), St. Joseph's Orphan Home (two miles), St. Louis City Hospital (two miles), St. Louis City Infirmery (four miles), Dispensary of St. Mary's Infirmery (one mile), and St. Stanislaus Seminary (sixteen miles)

Clinical facilities in the Dispensaries and Hospital where dental students received instruction, and performed stated clinical service, in 1924-25: in the Hospital, complete for all aspects of medicine and surgery; in each Dispensary, a full dental equipment

Number of dental externships (no internships), held by students of the School, in the Dispensaries and Hospital in 1924-25: eleven; the externe service is rotational, and a relatively large number of the members of each senior class profit therefrom

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: general operative dentistry, oral surgery, and dental medicine; to enlarge the School's civic and charitable service, and to teach dentistry under the conditions that prevail in a good hospital

Library (in an adjoining medical building): room, 3500 sq. ft.; two whole-time and one half-time librarians. Contains 12,000 bound and 1171 unbound volumes, and 20,000 pamphlets (all but the pamphlets are effectively card indexed). Of the volumes, approximately 500 relate to dental subjects

Library facilities additional to those in the medical building that are conveniently accessible to dental students: University Library (one-half mile), and the St. Louis University Branch of the Public Library (one-half mile); in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25; none

Dean: whole-time officer; also Professor of the Practice of Dentistry. *Regent*: part-time officer in the Dental School; whole-time officer in the University; also Professor of Biology in the University. *Secretary* and Superintendent of the Clinic: whole-time officer; also Associate Professor of Operative Dentistry

Minimum academic requirement for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (15 units), or its equivalent (since 1920)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

The School will lengthen its curriculum to five years, the first of which will include several dental subjects. Students who have completed one year of approved work in an accredited academic college will be admissible to the second year of the five-year curriculum, with conditions in the dental subjects of the first year. Provision will be made to facilitate the removal of any such conditions before the end of the second year. Academic subjects, almost exclusive in the first year, will be continued annually on a decreasing requirement to a minimum in the fifth year, whereas the professional subjects will be given cumulative attention throughout the five years. The vocational subjects in the first year will be additional to 30 semester hours of academic work. Qualified students will receive the B.S. degree at the end of the fourth year; D.D.S. at the end of the fifth year. Opportunity for graduate work will soon be created and the two-three-graduate plan approximated, with the gradient variation

Number of graduates (1909-1925): 887; average per year, for seventeen years, 52. (Number for the Dental Department of Marion-Sims College of Medicine and the two colleges developed from it, 1896-1908 — 388; average per year, for thirteen years, 30)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 246; proportion from Missouri: 1922-23 — 41 per cent; 1923-24 — 44 per cent; 1924-25 — 39 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21 — 6847; 1921-22 — 6494; 1922-23 — 9992; 1923-24 — 12,082; 1924-25 — 14,578

Number of visits: 1920-21 — 68,470; 1921-22 — 64,940; 1922-23 — 99,920; 1923-24 — 120,820; 1924-25 — 145,780 (the figures are estimates)

Number of patients treated in the Dispensaries and Hospital, by dental students under the supervision of representatives of the Dental School: 1920-24 — no affiliations; 1924-25 — 1222

Rated Class A by the Dental Educational Council of America (July 1, 1923): last previous rating (1920), Class A

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$189,775, and equipment, \$38,524; total, \$228,299 (July 31, 1925)

General debt on the School, or carried by the University on the School's account (July 31, 1925): none

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on July 31				
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$36,605	\$42,888	\$68,146	\$78,591
Fees paid by patients, in all clinical departments	26,288	24,775	40,908	52,607
Gifts	3,000	3,500	5,000	6,500
Miscellaneous receipts	None	48	194	401
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	5,359	None
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	10,000	15,000	16,000	20,000
Total amount of current income	\$75,893	\$86,211	\$135,607	\$158,099
<i>Total amount of current expenditures</i>	\$73,866	\$91,779	\$119,538	\$157,298
Surplus for the year	2,027	None	16,069	801
Deficit for the year	None	5,568	None	None
Amount expended for the School by the University, in excess of current dental income, and included in "University funds," above	7,973	20,568	5,290	19,199
<i>Capital expenditures</i> (additional) by the University:				
For the new building	None	None	130,000	None
For new equipment	None	None	12,273	None
Average amount expended by the School per student (D.D.S.) per year	385	419	397	485
Average amount of all student fees paid to the School per student (D.D.S.) per year	191	196	226	243
<i>Details of current expenditures:</i>				
For reduction in principal of debt	1,000	1,000	15,000 ²	None
For interest on debt	290	290	2,282	None
For "rent"	5,000 ³	5,000 ³	None	None
For repairs				
For new equipment }	1,514	1,417	... ⁴	2,164
For new construction (or land)	None	None	None ⁴	None
For research	None	None	None	None
For improvement of the library	85	432	299	517
For supplies used in the clinical departments	9,762	9,258	14,636	18,535

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment; no money was borrowed for current expenses; and all miscellaneous receipts are included in the recorded items above.

² This amount was paid into the Endowment Fund for the Medical and Dental Schools, in partial repayment of the cost of construction and equipment of the new building. See "Capital expenditures," above.

³ The last two payments to the stockholders of the St. Louis Dental College were made in 1921 and 1922. See "Organized," on page 423.

⁴ See "Capital expenditures," above.

	(1)	(2)	(3)	(4)
Data for years ending on July 31	1920-21	1921-22	1922-23	1923-24
For salaries: for administration	\$10,553	\$11,573	\$13,582	\$15,362
For salaries: for teaching	24,895	24,914	33,164	48,577
For all other purposes	20,767	37,895	40,575	72,143
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(18)	(20)	(22)	(24)
Amount of their salaries as teachers	11,505	13,549	20,524	29,577
Number of teachers of dental subjects who did not receive salaries	(1)	(4)	(6)	(8)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	2,400	3,000	3,600	3,900
Smallest salary paid to a whole-time teacher of a dental subject	1,600	1,600	1,800	2,400
(Number of teachers of academic or medico-dental subjects) ¹	(24)	(28)	(28)	(28)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	13,390	11,365	12,640	19,000
Largest salary paid to a whole-time teacher of an academic or medico-dental subject ²	6,000	7,000	7,000	7,500
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject (paid to a Fellow)	500	500	500	500
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	5,500	9,500	9,700	12,500
Salary value of the teaching by Jesuits without expense to the School (included in "Gifts" and "Total expenditures," above)	3,000	3,500	5,000	6,500

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 74. Of this total number, 11 were whole-time, none half-time, and 34 part-time or occasional teachers of academic or medico-dental subjects; 10 were whole-time, 5 half-time, and 14 part-time or occasional teachers of dental subjects; 10 were whole-time teachers in the Dental School only; 12 were "full" professors; 9 were associate or assistant professors; 3 were lecturers by title; 10 received no salaries; 50 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Summer courses in clinical dentistry (June, July, August, and September); since 1920; attendance: 1922—35; 1923—41; 1924—47; 1925—34

No combined curricula leading to the degrees of B.S. or B.A. and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: actively in progress in 1924-25, on the replacement of extracted dental pulp by connective tissue elements through the agency of protein implants; the degeneration

¹ Not including juniors and seniors in the Medical School who served as laboratory assistants—34 in 1924-25.

² All academic subjects are taught to dental students by members of the Faculty of Arts and Science; all medico-dental subjects, by members of the Faculty of Medicine.

STUDENTS AND GRADUATES: SCHOOL OF DENTISTRY, ST. LOUIS UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	181	128	202	220	309	344
Women.....	0	0	0	0	0	0
From other countries; chiefly from British Honduras and Central America.....	3	6	8	4	9	3
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	162	123	192	219	301	324
Admitted after examination.....	0	4	0	0	0	0
Admitted to advanced standing.....	2	3	17	8	16	17
From other countries, to advanced standing.....	0	2	3	0	0	0
"Repeaters" of one or more subjects.....	16	11	19	21	35	44
Denied further instruction because of deficient scholarship.....	9	3	3	7	7	10
GRADUATES (D.D.S.)						
Total number of graduates.....	129	8	39	16	61	67
Women.....	0	0	0	0	0	0
Admitted to practice in other countries.....	2	2	2	0	1	2
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	14	1	3	4	7	10
Percentages of failures in such state-board examinations.....	12.1	0	5.6	0	5.1	10.4

of teeth during pregnancy; one publication by a teacher of a dental subject in 1924, none in 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service, although communities that apply for dentists are investigated and the opportunities are referred to seniors or graduates, with recommendations

No effort has been made by the School to determine recurrently the quality of the instruction as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: November, 1921; May, 1922; January, 1923

The foregoing data have been verified in detail by the Dean

SUMMARY

DURING the past three years this School, in a new building having modern equipment, and in close associations with the Medical School in an adjacent new building and with the Academic College a half-mile distant, has acquired greatly improved facilities. The academic and medico-dental sciences are taught to dental students at the Academic College and in the medical building, respectively, under conditions of interest and helpfulness that promote the most effectual work in these subjects. Instruction of the dental students in the correlations between clinical dentistry and clinical medicine is undergoing improvement. The salaries have been insufficient for experienced instructors, research has not been actively promoted, and the effort of the School has been restricted to the work for undergraduates. In 1921-22 the last phase of the financial obligation to the former owners of the School was liquidated from current income. It is regrettable that the friends of the University do not make it unnecessary for the School to obtain a profit from which to repay to the University a share of the cost of the new building, over \$10,000 having been expended on this account in 1924-25. The data in the table on page 428 for the geographical distribution of the students, in 1924-25 and in 1925-26, indicate that approximately two-thirds came from Missouri and Illinois, and that the relatively large number of students from Illinois is increasing rapidly. Comparative data relating to students, graduates, and results of license examinations, are tabulated on pages 429-430.

DENTAL SCHOOLS IN THE UNITED STATES

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT ST. LOUIS UNIVERSITY: 1924-26

1924-25					
<i>States (25), territories (2), and foreign countries (3)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Arkansas	0	3	2	1	6
Hawaiian Islands	9	1	2	0	12
Illinois	40	33	26	24	123
Indiana	2	2	5	1	10
Iowa	4	1	1	3	9
Kansas	2	1	4	3	10
Michigan	2	0	1	1	4
Missouri	38	34	29	34	135
Ohio	1	1	5	1	8
Alabama, Arizona, Greece, Guatemala, Kentucky, Louisiana, Mexico, Mississippi, Montana, New York, Porto Rico, Vermont — one each	7	1	2	2	12
Florida, Minnesota, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Washington — two each	3	5	6	4	18
Total	108	82	83	74	347

1925-26					
<i>States (27), territories (2), and foreign countries (5)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Arkansas	2	0	3	2	7
Hawaiian Islands	4	9	1	2	16
Illinois	57	36	27	20	140
Indiana	3	1	2	4	10
Iowa	0	2	1	2	5
Kansas	1	1	1	4	7
Kentucky	3	1	0	0	4
Minnesota	3	1	0	1	5
Missouri	55	37	34	25	151
Ohio	7	2	1	5	15
Oklahoma	5	0	2	0	7
Pennsylvania	3	1	0	0	4
Arizona, Canada, Connecticut, Greece, Louisiana, Michigan, Newfoundland, New Jersey, Porto Rico, South Dakota, Tennessee, Vermont, West Virginia, Wyoming — one each	8	3	2	1	14
California, Florida, Guatemala, New York, Texas, Utah, Washington — two or three each	7	2	2	6	17
Total	158	96	76	72	402

Although the Dean of the Dental School is one of the four members of the Administrative Board of the Medical School, oral health-service receives no formal notice in the instruction of the medical students, but the conventional specialties are given their customary places in the medical curriculum. There are two dentists on the staff of the University Hospital, one serving as Exodontist, and the other as Orthodontist, each of whom is also a member of the Faculty of the Dental School.

GENERAL COMMENT

In five of the eight surrounding states — Iowa, Illinois, Kentucky, Tennessee, and Nebraska — there are ten dental schools; three states — Arkansas, Oklahoma, and Kansas — contain none. The three schools in Missouri represent three types: (a) an inde-

DATA PERTAINING TO THE DENTAL SCHOOLS IN THE STATE OF MISSOURI: 1919-26

Total attendance

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Kansas City-Western	230	282	310	366	393	415	398
Washington	79	103	81 ¹	71	52	38 ¹	120 ²
St. Louis	123	192	219	301	327	341	402
Total	432	577	610	738	772	794	920

Percentage of students resident in Missouri

Kansas City-Western	28	24	31	34	36	37	40
Washington	40	42	45 ¹	44	44	37	36 ²
St. Louis	42	43	42	41	44	39	38

Number of graduates

Kansas City-Western	22	48	61	92	69	91	100 ³
Washington	3	14	18	28	31	7 ¹	21 ³
St. Louis	8	39	16	61	67	74	73 ³
Total	33	101	95	181	167	172	194

Classification of the total attendance

	First year	Second year	Third year	Fourth year	Total
Kansas City-Western: 1923-24	98	107	100	88	393
1924-25	96	106	100	113	415
1925-26	98	91	109	100	398
Washington: 1923-24	7	7	7 ¹	31	52
1924-25	16	7	8	7 ¹	38
1925-26	61 ²	29 ²	9 ²	21 ²	120 ²
St. Louis: 1923-24	93	90	75	69	327
1924-25	105	80	82	74	341
1925-26	156	97	76	73	402

pendent and non-proprietary school (Kansas City-Western); (b) a university school isolated from the school of medicine (Washington); (c) a university school closely coordinated with the medical school (St. Louis). All confine their teaching activities to the undergraduate curriculum, are weak in their instruction in the correlations of clinical dentistry with clinical medicine, and are inattentive to research. The recent contribution of each of the Missouri schools to the needs of the state may be noted from the data in the accompanying table. Each school draws its students chiefly from territory outside of Missouri. In recent years the attendance and the number of graduates have been greatest at Kansas City-Western and least at Washington. Since 1921, the number of students at St. Louis University has shown the most consistent gain, that at Washington having declined annually until 1925-26, when the School temporarily dropped its minimum entrance requirement to graduation from a high school (page 421). That a large number of students were admitted to advanced standing at Washington, on the lower scholastic standard, may be seen from the figures for the classes

¹The first group affected by the former entrance requirement of one year of approved work in an accredited academic college.

²The attendance was increased in 1925-26 by a return, for each class, to graduation from an accredited high school as the minimum entrance requirement, and as the basis for admission to advanced standing.

³The number of seniors (December, 1925).

DENTAL SCHOOLS IN THE UNITED STATES

ATTENDANCE OF RESIDENT STUDENTS AT THE THREE MISSOURI
DENTAL SCHOOLS: 1924-26*1924-25: Washington alone on the higher entrance requirement*

School	First year	Second year	Third year	Fourth year	Total number of resident students	Total attendance
Washington (A) ^{1, 2}	4	4	5	1	14	38
St. Louis (A) ³	38	34	29	34	135	347
Kansas City-Western (B) ³	48	41	38	35	162	435
Total	90	79	72	70	311	820

1925-26: All of the schools on the lower entrance requirement

Washington (A) ³	24	9	5	5	43	120
St. Louis (A) ³	55	37	34	25	151	402
Kansas City-Western (B) ³	45	36	38	40	159	399
Total	124	82	77	70	353	921

in 1924-25 and 1925-26 (page 429). The above comparative data for attendance at the three Missouri schools during these two years indicate that the recession at Washington to a high-school foundation did not diminish the number of Missourians at either of the other two schools in the state.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the Missouri schools who failed, in the number of states indicated by the figures in parenthesis:

1925. — Kansas City-Western, 2.2 (8); St. Louis, 4.3 (11); Washington, none (1); U. S. schools collectively, 11.3.

1910-25 (cumulative). — St. Louis, 6.1 (23); Washington, 3.6 (11); U. S. schools collectively, 14.2.

1920-25 (cumulative). — Kansas City-Western, 2.7 (14); U. S. schools collectively, 12.2.

MONTANA

Population: 637,904. Number of dentists, 342; physicians, 525. Ratios: dentists to population, 1: 1865; physicians to population, 1: 1215; dentists to physicians, 1: 1.5

Statutory requirements. *Dentistry*. — Preliminary education: none. Professional training: graduation from a reputable dental school. *Medicine*. — Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school

Dental school: none; medical school: none

¹ The letters in parenthesis indicate the grade of the Dental Educational Council's rating.

² Minimum entrance requirement: one year of approved work in an accredited academic college.

³ Minimum entrance requirement: graduation from an accredited high school or the equivalent.

NEBRASKA

Population: 1,350,015. Number of dentists, 970; physicians, 1869. Ratios: dentists to population, 1:1392; physicians to population, 1:722; dentists to physicians, 1:1.9
 Statutory requirements. *Dentistry*.—Preliminary education: evidence of completion of courses equal in credit to 15 college entrance units. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A or Class B medical school, and one year of interne service in a hospital

Location of the dental schools (2): Lincoln and Omaha; medical schools (2): Omaha

LINCOLN

Population: 60,396. Number of dentists, 111; physicians, 229. Ratios: dentists to population, 1:544; physicians to population, 1:264; dentists to physicians, 1:2.1
 Number of dental clinics or infirmaries, 2; hospitals, sanatoriums, and charitable institutions, 10; hospitals approved for internships, 1

Dental School: University of Nebraska

COLLEGE OF DENTISTRY, UNIVERSITY OF NEBRASKA

Location (clinical building): Thirteenth and P Streets; at the centre of the city

General character: integral part of the University of Nebraska

Organized: in 1918, by absorption of the Lincoln Dental College which, established in 1899, was affiliated from 1899 to 1903 with both the Lincoln Medical College and Cotner University (Bethany, Nebraska), and from 1903 to 1918 with the University of Nebraska

Building: the technical and clinical courses in dentistry are given in rented rooms in the Liberty Theatre Building, which was erected in 1891; total floor area in this building used by the School, 9006 sq. ft. Distance from the site of the University, three blocks. The academic and medico-dental subjects are taught in buildings on the campus of the University

Infirmary: in the clinical building, with four accessory rooms; total floor area, 3374 sq. ft. Total number of chairs in active use, 44, including groups reserved for special purposes: prosthodontia, 4; diagnosis, examination, and oral surgery, 1 each

Relation of the School of Medicine (Class A): the Medical School of the University of Nebraska is situated in Omaha. The University's pre-dental curriculum is identical with the first year of its pre-medical curriculum (at Lincoln), and the two groups of students are taught together. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospitals in which dental students received accredited instruction in 1924-25: State Orthopedic Hospital (one and one-half miles), and St. Elizabeth Hospital (one and one-half miles); adjacent to each other

Clinical facilities in the Hospitals where dental students received instruction in 1924-25: complete for general surgery and oral surgery; in the latter relation, for operations on cleft palate and harelip particularly

- Number of dental internships* or externships in the Hospitals, in 1924-25: none
- Nature and specific purposes of the accredited clinical instruction* given elsewhere than in the dental building, in 1924-25: clinics in general surgery and oral surgery; to teach dentistry under the conditions that prevail in good hospitals
- Library* (with that for Biology in Bessey Hall, five blocks from the clinical building): room, 1944 sq. ft.; whole-time librarian. Contains about 10,000 bound and 10,000 unbound volumes, and 5000 pamphlets (all effectively card indexed). Of the volumes, approximately 1000 relate to dental subjects
- Library facilities* additional to those in Bessey Hall that are conveniently accessible to dental students: University Library; Libraries of the University Departments of Chemistry, Physiology, and Pharmacy
- Scholarships, fellowships, or similar financial assistance* received by dental students in 1924-25: none
- Dean*: whole-time officer; also Professor of Dental Literature and Applied Science, and Professor of Operative Dentistry. *Associate Dean*: whole-time officer; also Associate Professor of Operative Dentistry and Director of the Infirmary
- Minimum academic requirement* for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921). Of the total number of pre-dental students at the University of Nebraska in 1923-24, approximately 36 per cent were denied admission to the Dental School because of deficient scholarship; in the succeeding year the rejections for this reason amounted to 34 per cent
- Next prospective advance* in the minimum academic requirement for admission: uncertain
- Number of graduates* (1919-25): 158; average per year, for seven years, 23. (Number for the Lincoln Dental College, 1901-18—228; average per year, for eighteen years, 13)
- Average total attendance*, per year (at the end of the year), for the past ten years (1916-25): 98; proportion from Nebraska: 1922-23—86 per cent; 1923-24—88 per cent; 1924-25—90 per cent
- Clinical service* of the Dental School in the instruction of students:
 Number of persons treated: 1920-21—6120; 1921-22—6120; 1922-23—5327; 1923-24—4156; 1924-25—3682 (the figures for 1920-24 are estimates)
 Number of visits: 1920-21—39,780; 1921-22—39,780; 1922-23—34,625; 1923-24—27,014; 1924-25—23,932 (the figures are estimates)
- Number of patients* treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-25—none
- Rated Class B* by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

- Estimated value of the equipment in the clinical building: \$17,000 (June 30, 1925). The School shares the use of university buildings and equipment for the academic and medico-dental sciences valued at \$475,000 and \$50,000, respectively
- General debt on the School, or carried by the University on the School's account for equipment in the clinical building (June 30, 1925): \$6146 at 6 per cent interest per annum. On October 3, 1918, the University purchased the equipment of the Lincoln Dental College for \$17,867. All but \$6146 has been paid from current income (June 30, 1925)

	(1)	(2)	(3)	(4)
Data for the periods indicated ¹	1918-20	1920-22	1922-23	1923-24
	Nov. 30, '18- Nov. 30, '20: 24 months	Dec. 1, '20- June 30, '22: 19 months	July 1, '22- June 30, '23: 12 months	July 1, '23- June 30, '24: 12 months
<i>Current income</i> : ²				
Fees (all kinds) paid by the students	\$27,419	\$24,128	\$14,109	\$14,026
Fees paid by patients, in all clinical departments	25,138	26,387	33,362	23,245
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	None	None
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	50,659	73,183	18,876	23,368
Total amount of current income	\$103,216	\$123,698	\$66,347	\$60,639
<i>Total amount of current expenditures</i>	\$103,216	\$123,698	\$66,347	\$60,639
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	50,659	73,183	18,876	23,368
Average amount expended by the School per student (D.D.S.) per year ³	626	515	677	713
Average amount of all student fees paid to the School per student (D.D.S.) per year ³	166	101	144	165
<i>Details of expenditures</i> :				
For reduction in principal of debt	3,573	1,787	1,787	1,787
For interest on debt	2,037	855	750	583
For rent	5,400	4,275	2,700	3,750
For repairs	672	344	500	325
For new equipment	1,946	1,913	886	443
For new construction (or land)	None	None	None	None
For research	None	None	None	None
For improvement of the library (dental section)	14	None	None	None
For supplies used in the clinical departments	5,617	8,064	10,155	5,095
For salaries: for administration	15,112	18,260	8,815	7,397
For salaries: for teaching	67,428	71,573	37,180	38,522
For all other purposes	1,417	16,627	3,574	2,737
<i>Salaries for instruction</i> :				
(Number of teachers of dental subjects)	(19)	(19)	(18)	(14)
Amount of their salaries as teachers	29,428	31,573	20,850	24,358
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	3,600	3,600	3,600	3,600
Smallest salary paid to a whole-time teacher of a dental subject	1,500	1,800	2,100	2,400
(Number of teachers of academic or medico-dental subjects)	(13)	(13)	(13)	(15)

¹From official records in the "Financial reports of the University of Nebraska." When complete data are not available, close estimates are given.

²During the academic years 1918-24, there was no surplus, no appropriation by the State directly, or by the City, and no income from endowment, or gift; no money was borrowed; and there were no miscellaneous receipts.

³Obtained, for the first two periods, by dividing the corresponding amount by the total number of students in 1918-20 and 1920-22, respectively. This procedure ignores the fact that the second period was only nineteen months in length as compared with the twenty-four months of the first period, and as a consequence the figures are relatively low for the second period.

DENTAL SCHOOLS IN THE UNITED STATES

Data for the periods indicated ¹	(1)	(2)	(3)	(4)
	1918-20 Nov. 30, '18- Nov. 30, '20: 24 months	1920-22 Dec. 1, '20- June 30, '22: 19 months	1922-23 July 1, '22- June 30, '23: 12 months	1923-24 July 1, '23- June 30, '24: 12 months
Amount of their salaries as teachers (including a proper allotment of university salaries for the instruction of dental students)	\$38,000	\$40,000	\$16,330	\$14,164
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School (Lincoln)	4,000	4,500	4,500	4,500
In the Medical School (Omaha)	4,000	4,500	4,500	4,500
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,400	1,600	1,600	1,800
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University (the "allotment" referred to above)	38,000	40,000	16,330	14,164

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 29. Of this total number, 11 were whole-time, none half-time, and 8 part-time or occasional teachers of academic or medico-dental subjects; 4 were whole-time, 1 was a half-time, and 10 were part-time or occasional teachers of dental subjects; 4 were whole-time teachers in the Dental School only; 10 were "full" professors; 4 were associate or assistant professors; none were lecturers by title; all received salaries; 18 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. or B.A., and D.D.S.: since 1919; now six years (B.S.) and seven years (B.A.) in length

Course for dental mechanics (conducted by the University with the coöperation of the Prosthetic and Crown and Bridge sections of the Dental School): since 1921; attendance:

STUDENTS AND GRADUATES: COLLEGE OF DENTISTRY, UNIVERSITY OF NEBRASKA

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	84	110	139	130	101	86
Women.....	0	0	1	1	1	1
From other countries.....	1	0	0	1	0	0
Negroes.....	0	0	0	1	0	0
Attendance at the end of the year.....	75	90	126	114	98	85
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	4	4	4	5	1	0
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	5	1	2	1	0	8
Denied further instruction because of deficient scholarship.....	4	5	4	5	3	0
GRADUATES (D.D.S.)						
Total number of graduates.....	37	9	9	16	45	32
Women.....	0	0	0	0	0	0
Admitted to practice in other countries.....	1	0	0	1	0	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	3	2	1	1	3	2
Percentages of failures in such state-board examinations.....	2.7	0	0	13.3	15.1	6.7

¹ From official records in the "Financial reports of the University of Nebraska." When complete data are not available, close estimates are given.

1921-22—14; 1922-23—11; 1923-24—9; 1924-25—4; discontinued at the end of 1924-25—no further demand

Summer courses in clinical dentistry (June and July): since 1918; attendance: 1922—22; 1923—15; 1924—13; 1925—16

No course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: none in progress in 1924-25; no publication, by a teacher of a dental subject, in 1924 or 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: a course in practice building includes matters pertaining to choice of location. A registry of applications for dentists is made accessible to students and graduates. The School coöperates with the local dental supply house in placing graduates

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: May, 1922

The foregoing data have been verified in detail by the Dean

SUMMARY

THE distance between the Dental School in Lincoln and the Medical School in Omaha prevents coöperation between these schools, which is unfortunate for both. The Dental School, although deprived of the assistance of the Medical Faculty, is intimately coördinated with the Academic College of the University, where a high grade of scholarship must be attained for admission to the Dental School and where the dental students receive instruction in the medico-dental subjects. There is a striking contrast between the excellent facilities for instruction in the academic and medico-dental subjects on the University campus and the poorly adapted quarters for clinical dentistry in a rented building—a reversal of the common tendency in dental schools to give the clinical aspects of the instruction preference over all others. The relationships with the two Lincoln hospitals do not include practical experience for the students.

The number of whole-time teachers in the Dental School is small, the salaries for instruction are low, research has been neglected, graduate study has not been encouraged, and the Faculty restricts its efforts almost entirely to the undergraduate curriculum. The School was one of the group that in 1921 began to require a year of approved work in an accredited academic college for admission. After 1920-21, the attendance, which had been increasing, diminished until 1923-24, but has remained practically stationary during the last three years (page 441). Nearly all of the students reside in Nebraska, the proportion having risen lately to 93 per cent. The geographical distribution of the students, in 1924-25, is shown in the accompanying table. Comparative data relating to students, graduates, and results of license examinations, are tabulated on page 441.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF

NEBRASKA: 1924-25

<i>States (5), territory (1), and foreign country (1)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Kansas	0	1	1	0	2
Nebraska	25	26	14	9	74
New York	2	0	0	0	2
England, Hawaiian Islands, Iowa, New Mexico— one each	2	1	0	1	4
Total	29	28	15	10	82

The geographical separation of the Medical School from the University, which seems to have been determined largely by political rather than educational considerations, has kept alive the question whether the Dental School should be continued in Lincoln or associated with the Medical School in Omaha. That the Dental School cannot attain its greatest usefulness in the future completely separated from the Medical School, without waste of public funds, seems to be obvious. Early elevation of the pre-dental curriculum to two years of approved work in an accredited academic college, in general accord with the University's pre-medical program, and adoption of the two-three-graduate plan, including combined medical and dental curricula and graduate opportunities at the Medical School, would probably facilitate the wisest decision regarding the permanent location of the Dental School.

There are no required courses in oral health-service at the Medical School, although the curriculum contains reservations for the usual specialties, but the first steps in the development of such instruction have been taken. The medical students may elect a course in oral surgery during the second semester of the senior year. This course gives special attention to oral hygiene and prophylaxis, prevention of deformities, cleft palate, harelip, and considerations of diagnosis and management.

OMAHA

Population: 209,846. Number of dentists, 219; physicians, 478. Ratios: dentists to population, 1: 958; physicians to population, 1: 439; dentists to physicians, 1: 2.2 Number of dental clinics or infirmaries, 3; hospitals, sanatoriums, and charitable institutions, 24; hospitals approved for internships, 3

Dental School: Creighton University. *Medical Schools* (2): Creighton University, University of Nebraska

COLLEGE OF DENTISTRY, CREIGHTON UNIVERSITY

Location: on the site of the University; one mile from the centre of the city

General character: integral part of Creighton University

Organized: in 1905. In 1906 the School absorbed the Omaha Dental College (1895-1906)

Building: erected in 1921; total floor area, 33,600 sq. ft. Situated one mile from the medical buildings

Infirmary: in the dental building, with seven accessory rooms; total floor area, 8540 sq. ft. Total number of chairs in active use, 95, including groups reserved for special purposes: prosthodontia, 5; extraction, 4; examination, 3; roentgenography, 1

Relation of the School of Medicine (Class A): the dental students are taught gross anatomy at the Medical School by dental teachers; all other medico-dental subjects are taught by the Dental Faculty in the dental building. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction in 1924-25: St. Joseph's Hospital, under the direction of the Creighton Medical Faculty; two miles from the dental building

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for general medicine and oral surgery; a new equipment this year for the latter. Since January, 1925, a member of the Dental Faculty has served as Attending Dentist at the Hospital daily from 8 to 11 a.m., and has conducted a regular weekly clinic in oral surgery. Since July 1, 1925, the Hospital has had a dental interne

- Number of dental internships* or externships in the Hospital, in 1924-25: none
- Nature and specific purposes of the accredited clinical instruction* given elsewhere than in the dental building, in 1924-25: clinical oral surgery; to teach this subject under the conditions that prevail in a good hospital
- Library* (in the dental building): room, 888 sq. ft.; part-time librarian. Contains 1589 bound and 405 unbound volumes, and 440 pamphlets (without a card index). Of the volumes, approximately 1482 relate to dental subjects
- Library facilities* additional to those in the dental building that are conveniently accessible to dental students: the Libraries of the University (adjacent building) and the Medical School (one mile); the former in active use
- Scholarships, fellowships, or similar financial assistance* received by dental students in 1924-25: ten students; total amount, \$1750, all of which was provided by the School
- Dean*: part-time officer; also Professor of Operative Dentistry and Dental Pathology.
Vice-Dean: none. *Regent*: whole-time officer; also Lecturer on Dental Ethics
- Minimum academic requirement* for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy, 15 units (since 1914)
- Next prospective advance* in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926
- Number of graduates* (1906-25): 505; average per year, for twenty years, 25. (Number for the Omaha Dental College, 1896-1905—record incomplete for five of the ten years: 59 for five years; average, 12)
- Average total attendance*, per year (at the end of the year), for the past ten years (1916-25): 156; proportion from Nebraska: 1922-23—39 per cent; 1923-24—37 per cent; 1924-25—36 per cent
- Clinical service* of the Dental School in the instruction of students:
Number of persons treated: 1920-21—2349; 1921-22—3277; 1922-23—4205; 1923-24—4658; 1924-25—4800
Number of visits: 1920-21—11,745; 1921-22—16,385; 1922-23—20,025; 1923-24—23,290; 1924-25—24,000 (the figures are estimates)
- Number of patients* treated in the Hospital, by representatives of the dental school, in the presence of dental students: 1920-21—10; 1921-22—12; 1922-23—15; 1923-24—10; 1924-25—16. (None by dental students)
- Rated Class A* by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

- Estimated value (Dental School) of land and building, \$285,000, and equipment, \$95,000; total, \$380,000 (June 30, 1925)
- General debt on the School (June 30, 1925): \$21,992; carried by the University on the School's account, without charge against the dental budget for interest

DENTAL SCHOOLS IN THE UNITED STATES

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on June 30				
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$20,885	\$23,793	\$37,750	\$37,694
Fees paid by patients, in all clinical departments	12,931	14,338	18,852	25,059
Gifts	4,800	4,800	5,600	6,600
Miscellaneous receipts	6,413	1,266	522	None
University funds, additional to the income designated above:				
(a) Direct appropriation	2,400	7,100	8,211	None
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget ²	None	None	None	None
Total amount of current income	\$47,429	\$51,297	\$70,935	\$69,353
<i>Total amount of current expenditures</i>	\$47,429	\$51,297	\$70,935	\$69,353
Amount expended for the School by the University, in excess of dental income, and included in "University funds" above	2,400	7,100	8,211	None
<i>Capital expenditures</i> (additional) by the University, for a new building	None	260,000	35,000	None
And its equipment	None	51,000	13,000	None
Average amount expended by the School per student (D.D.S.) per year	334	291	343	340
Average amount of all student fees paid to the School per student (D.D.S.) per year	147	135	182	185
<i>Details of current expenditures:</i> ³				
For repairs	1,500	... ²	... ²	18,056
For new equipment	None	... ²	... ²	None
For new construction (or land)	None	None	None	None
For research ⁴	97	246	460	340
For improvement of the library	5,963	9,149	14,396	10,617
For supplies used in the clinical departments	5,423	5,291	6,211	5,826
For salaries: for administration	21,460	21,719	25,239	28,423
For salaries: for teaching	12,986	14,892	11,629	6,091
For all other purposes				
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(15)	(20)	(20)	(22)
Amount of their salaries as teachers	12,950	13,195	16,367	20,690
Number of teachers of dental subjects who did not receive salaries	(3)	(3)	(4)	(3)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	2,750	2,750	3,000	3,500
Smallest salary paid to a whole-time teacher of a dental subject	2,025	2,500	1,600	2,000
(Number of teachers of academic or medico-dental subjects)	(11)	(14)	(18)	(17)

¹ During the academic years 1920-24, there was no surplus, no appropriation by the State or City, and no income from endowment; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² See "Capital expenditures."

³ During the academic years 1920-24, there was no payment on account of debt or rent.

⁴ Grants in support of research, by the Research Commission of the American Dental Association (page 160), were paid to members of the Faculty.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	\$8,510	\$8,524	\$8,872	\$7,733
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	3,600	3,600	3,600	4,000
In the Medical School	4,000	4,000	5,000	5,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	3,000	2,500	2,500	2,500
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	None	None	None	None
Salary value of the teaching by Jesuits without expense to the School (included in "Gifts" and "Total expenditures," above)	1,800	1,800	1,800	3,600

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 39. Of this total number, 5 were whole-time, 1 was a half-time, and 13 were part-time or occasional teachers of academic or medico-dental subjects; 5 were whole-time, 5 half-time, and 10 part-time or occasional teachers of dental subjects; 8 were whole-time teachers in the Dental School only; 11 were "full" professors; 2 were associate professors; 3 were lecturers by title; 3 received no salaries; 16 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1922; now six years in length

Summer courses in clinical dentistry (June and September): since 1914; attendance: 1922—

STUDENTS AND GRADUATES: COLLEGE OF DENTISTRY, CREIGHTON UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	121	113	145	177	213	209
Women.....	0	0	0	1	1	1
From other countries.....	1	1	0	0	3	2
Negroes.....	0	0	0	0	1	1
Attendance at the end of the year.....	101	108	142	176	207	204
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	0	2	0	0	1	0
From other countries, to advanced standing.....	0	0	0	0	1	0
"Repeaters" of one or more subjects.....	1	3	0	0	0	0
Denied further instruction because of deficient scholarship.....	5	16	21	21	20	27
GRADUATES (D.D.S.)						
Total number of graduates.....	49	3	16	16	27	26
Women.....	0	0	0	0	0	0
Admitted to practice in other countries.....	No available data	No available data	No available data	No available data	No available data	No available data
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	6	1	4	4	6	8
Percentages of failures in such state-board examinations.....	6.3	0	12.5	12.5	11.1 ¹	7.1

¹ This percentage was mistakenly given as 14.8 in the record published by the National Association of Dental Examiners.

June, 20, September, 35; 1923—June, 20, September, 35; 1924—June, 20, September, 35; 1925—June, 10, September, 30

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: actively in progress in 1924-25, on the comparative histology of bone and tooth; cavity preparation and gold-foil fillings; one publication in 1924, another in 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: May, 1922; January, 1923

The foregoing data have been verified in detail by the Regent

SUMMARY

THE School, conducted with marked independence of other parts of the University, is housed in a new building where nearly all of the instruction of dental students is concentrated. General anatomy is taught at the Medical School by members of the Dental Faculty who are not included in the Medical Faculty. The relation with the Medical School lacks intimacy, apparently by mutual acquiescence. There has been corresponding inattention, in both schools, to instruction in the correlations between clinical dentistry and clinical medicine. The schedule of instruction at the Medical School includes formal courses in special subjects relating to parts of the head, but omits oral health-service. Late in 1924-25 an operating room at St. Joseph's Hospital was reserved for dental work and oral surgery, a dental interne was appointed, and a sub-department of oral surgery was organized under the supervision of the Dean of the Dental School, with an oral surgeon ("Attending Dentist") and the interne in regular attendance. These officers are now giving instruction in oral health-service to medical students (1925-26). The development of this service may also occasion desirable improvement in the clinical instruction of dental students.

For a school that conducts practically all of the instruction without assistance from other departments, the number of whole-time teachers is small and the salaries are inadequate. In 1924-25, for example, nineteen teachers of academic or medico-dental subjects,

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT CREIGHTON UNIVERSITY: 1924-25

<i>States (16) and territory (1)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Iowa	18 ¹	15	13	8	54
Kansas	2	3	4	1	10
Minnesota	3	3	7	5	18
Nebraska	22	18	15	20	75
North Dakota	3	1	1	0	5
South Dakota	5	6	3	9	23
Wyoming	0	2	2	1	5
Hawaiian Islands, Idaho, Missouri, Ohio, Oregon, Utah—one or two each	2	1	4	0	7
Illinois, Montana, Oklahoma, Washington— three or four each	5	1	4	3	13
Total	60	50	53	47	210

¹ The new first-year class (1925-26) contains 16 students from Iowa.

three bearing a whole-time relationship, received salaries amounting to a total of but \$8666; twenty teachers of dental subjects, five giving whole-time service, were paid only \$24,975. The School's educational program does not extend beyond the scope of the undergraduate curriculum. Research has been encouraged by several small grants from the Research Commission of the American Dental Association. Despite the usefulness of the new building and the convenience of a low admission requirement, the School has not lately been gaining in attendance, but the increase in the size of the present first-year class (table below) may be an augury of an upward trend. Nearly two-thirds of the number of students reside elsewhere than in Nebraska. During the past few years, the number of students from Iowa has increased annually. The geographical distribution of the students, in 1924-25, is shown in the table on page 440. Comparative data relating to students, graduates, and results of license examinations, are tabulated below and on page 442.

GENERAL COMMENT

Of the six adjacent states, South Dakota, Kansas, and Wyoming are without a dental school, but Iowa, Missouri, and Colorado contain five. The usefulness of each of

COMPARATIVE DATA PERTAINING TO THE TWO DENTAL SCHOOLS IN THE STATE OF NEBRASKA: 1919-26

Total attendance

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Nebraska	90	126	114 ¹	98	85	80	90
Creighton	108	142	176	207	204	204	223
Total	<u>198</u>	<u>268</u>	<u>290</u>	<u>305</u>	<u>289</u>	<u>284</u>	<u>313</u>

Proportion of students resident in Nebraska

Nebraska	97	92	93	86	88	90	93
Creighton	47	45	43	39	37	36	37

Number of graduates

Nebraska	9	9	16	45	32	10 ¹	15 ²
Creighton	3	16	16	27	26	47	51 ²
Total	<u>12</u>	<u>25</u>	<u>32</u>	<u>72</u>	<u>58</u>	<u>57</u>	<u>66</u>

Classification of the total attendance

	First year	Second year	Third year	Fourth year	Total
Nebraska: 1921-22	14 ¹	38	53	20	125
1922-23	8	3 ¹	31	53	95
1923-24	29	15	5 ¹	36	85
1924-25	28	26	15	11 ¹	80
1925-26	25	25	25	15	90
Creighton: 1921-22	80	44	36	16	176
1922-23	72	64	43	27	206
1923-24	57	58	60	34	209
1924-25	61	50	53	47	211
1925-26	80	54	38	51	223

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

² The number of seniors (December, 1925).

the two Nebraska schools to the home state, during recent years, may be inferred from the data in the table on page 441. The geographical data on pages 435 and 440 suggest that the schools in Nebraska attract very few students from the Rocky Mountain region.

The schools in this state are similar in being integral parts of universities and in lacking intimate coordination with schools of medicine, but are dissimilar in their pre-professional requirements and in their clinical facilities, the Lincoln school having a higher standard in preliminary education and giving the more effectual instruction in the academic and medico-dental subjects, but affording inferior clinical facilities. As the good schools in neighboring states continue to increase in efficiency, the Nebraska schools will probably fail to grow if they do not improve their instruction in the correlations between clinical dentistry and clinical medicine.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the Nebraska schools who failed, in the number of states indicated by the figures in parenthesis:

1925.—Creighton, 4.3 (5); Nebraska, none (2); U. S. schools collectively, 11.3.

1910-25 (cumulative).—Creighton, 5.4 (11); U. S. schools collectively, 14.2.

1919-25 (cumulative).—Nebraska, 7.1 (?); U. S. schools collectively, 12.8.

NEVADA

Population:¹ 77,407. Number of dentists, 50; physicians, 129. Ratios: dentists to population, 1:1548; physicians to population, 1:600; dentists to physicians, 1:2.6

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a three-year high school. Professional training: graduation from an accredited dental school together with four years of apprenticeship. *Medicine*.—Preliminary education: graduation from a high school or the equivalent. Professional training: graduation from a "legally recognized" medical school.

Dental school: none; medical school: none

NEW HAMPSHIRE

Population: 449,526. Number of dentists, 258; physicians, 601. Ratios: dentists to population, 1:1742; physicians to population, 1:748; dentists to physicians, 1:2.3

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited four-year high school. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college or the equivalent. Professional training: graduation from a registered Class A medical school

Dental school: none; medical school: Dartmouth College (gives only the first two years of a four-year curriculum)

¹The figure for population was that of the census of 1920, when the total was less than in 1910 (footnote 2, page 258).

NEW JERSEY

Population: 3,474,561. Number of dentists, 2661; physicians, 3567. Ratios: dentists to population, 1: 1306; physicians to population, 1: 974; dentists to physicians, 1: 1.3

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited four-year high school or the equivalent. Professional training: graduation from a "recognized" dental school, or a diploma or license granted by an accredited authority in a foreign country. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from an "approved, incorporated, registered" medical school, and one year of interne service in an approved hospital

Dental school: none; medical school: none

NEW MEXICO

Population: 377,371. Number of dentists, 95; physicians, 365. Ratios: dentists to population, 1: 3972; physicians to population, 1: 1034; dentists to physicians, 1: 3.8

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a high school or the equivalent. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a medical school above the grade of Class C

Dental school: none; medical school: none

NEW YORK

Population: 11,040,134. Number of dentists, 9923; physicians, 17,671. Ratios: dentists to population, 1: 1113; physicians to population, 1: 624; dentists to physicians, 1: 1.8

Statutory requirements. *Dentistry* (since January 1, 1926;¹ page 473).—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a registered dental school, or a diploma or license granted by a registered authority in a foreign country. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation, with the M.B. or M.D. degree, from a registered medical school in the United States or Canada, or, with the M.D. degree, from a medical school of equivalent standards in a foreign country

Location of the dental schools (4): Buffalo, New York City (2), and Rochester; medical schools (9): Albany, Buffalo, New York City (5), Rochester, and Syracuse

BUFFALO

Population: 549,550. Number of dentists, 457; physicians, 950. Ratios: dentists to population, 1: 1203; physicians to population, 1: 578; dentists to physicians, 1: 2.1

¹ For New York schools; to apply to all other registered schools on and after January 1, 1927.

Number of dental clinics or infirmaries, 7; hospitals, sanatoriums, and charitable institutions, 23; hospitals approved for internships, 8

Dental School: Buffalo University. *Medical School:* Buffalo University

SCHOOL OF DENTISTRY, UNIVERSITY OF BUFFALO

Location: 25 Goodrich Street; at the centre of the city

General character: integral part of the University of Buffalo

Organized: in 1892; self-supporting until 1921

Building: erected in 1896; special improvements were made in 1901 and 1923; total floor area, 20,891 sq. ft. Adjacent to the medical building; distance from the main site of the University, four miles

Infirmary: in the dental building, with seven accessory rooms; total floor area, 4435 sq. ft. Total number of chairs in active use, 58, including groups reserved for special purposes: prosthodontia, 15; oral surgery, 2; demonstration, and roentgenography, 1 each

Relation of the School of Medicine (Class A): all of the medico-dental subjects are taught in the laboratories of the Medical School, to dental students in separate classes, by members of the Medical Faculty. Some of the lectures and demonstrations are given to medical and dental students together. In 1924-25, one teacher of a medical subject gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction, in 1924-25: Buffalo City Hospital (one and one-fourth miles)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for all aspects of medicine and surgery

Number of dental externships (no internship), held by an officer of the School, in the Hospital in 1924-25: one

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: surgery (including general and block anesthesia), physical diagnosis, skin disease, oral pathology, oral therapeutics, oral diagnosis, oral bacteriology, radiology, and ward discussions of cases; to correlate the dental and medical sources and conditions of disease

Library (in the dental building): room, 463 sq. ft.; one part-time and one whole-time librarian. Contains 2550 bound and 100 unbound volumes, and no pamphlets (all effectively card indexed). Of the volumes, approximately 2200 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Medical School Library (adjacent), and Grosvenor Library (one-fourth mile); both in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: seven students; total amount, \$2177, of which none was provided by the School. The beneficiaries were ex-service men under the auspices of the U. S. Veterans Bureau

Dean: part-time officer; also Professor of Operative Dentistry. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant:* whole-time secretary

Minimum academic requirement for admission to the first-year class, in September, 1924: two years of approved work in an accredited academic college (since 1924)

Next prospective advance in the minimum academic requirement for admission: none under consideration

In 1924-25, this School, basing its four-year curriculum ("medico-dental curriculum") on two years of approved work in an accredited academic college, began to devote the first and second years

to "medicine" and the third and fourth to "dentistry"; and lengthened the third and fourth years to 40 weeks and 36 weeks, respectively, and the days (in dentistry) to 8 hours each. At present (1925-26) the days are 6 hours in length.¹ Although the Regents of the University of the State of New York publish a "minimum course of study for dental schools" that includes instruction in "dental subjects" in each of the four years, and specifies the minimum number of hours for each such subject in the year to which it is allocated, the School's test of the desirability of this particular curriculum is proceeding with the consent of the Regents²

Number of graduates (1893-1925): 1504; average per year, for thirty-three years, 46

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 205; proportion from the State of New York: 1922-23—98 per cent; 1923-24—98 per cent; 1924-25—96 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—2000; 1921-22—2508; 1922-23—2243; 1923-24—1896; 1924-25—1749 (the figure for 1920-21 is an estimate)

Number of sittings or operations: 1920-21—12,000; 1921-22—15,048; 1922-23—13,458; 1923-24—9308; 1924-25—10,494 (the figures for 1920-23 and 1924-25 are estimates)

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-24—no affiliation; 1924-25—none

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1920), Class A

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$183,674, and equipment, \$36,143; total, \$219,817 (September 30, 1925)

General debt on the School, or carried by the University on the School's account (September 30, 1925): \$30,500 (mortgage) at 5 per cent interest per annum

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ³				
Surplus used during the year (The total amount of the surplus for 1919-20)	\$229	None	None	None
Fees (all kinds) paid by the students	63,840	\$53,370	\$57,560	\$57,196
Fees paid by patients, in all clinical departments	12,211	14,154	16,031	15,485
Miscellaneous receipts	12,798	6,417	2,389	3,111
University funds, additional to the income designated above:				
(a) Direct appropriation	8,957	1,814	None	40,525
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget ⁴	None	None	None	None ⁵
Total amount of current income	\$98,035	\$75,755	\$75,980	\$116,317
Total amount of current expenditures	\$98,035	\$75,755	\$74,774	\$116,317
Surplus for the year	None	None	1,206	None

¹ The third year extends from September 1 to July 1; the fourth year from September 1 to June 1—additions of eight weeks and four weeks, respectively.

² In 1916-17, Columbia University established a dental school on a much higher scholastic ideal than any theretofore projected, but was not permitted by the Regents to proceed with the experiment now in progress at Buffalo.

³ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

⁴ All salaries for the instruction of dental students have been paid from the dental budget.

⁵ See "Capital expenditures (additional) by the University," on page 446.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Deficit for the year	None	None	...	None
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	\$8,957	\$1,814	None ¹	\$40,525
<i>Capital expenditures</i> (additional) by the University:				
For extensive reconstruction (no land)	None	None	None	\$30,572
For new equipment	None	None	None	10,802
Total	None	None	None	\$41,374
Average amount expended by the School per student (D.D.S.) per year	454	426	413	636
Average amount of all student fees paid to the School per student (D.D.S.) per year	296	300	318	313
<i>Details of current expenditures:</i>				
For reduction in principal of debt	10,000	None	None	None
For interest on debt	1,448	1,525	1,525	1,525
For rent: medico-dental laboratories in a private building ²	1,800	1,800	1,800	None
For repairs	340	2,182	1,867	398 479
For new equipment				
For research	None	None	None	None
For improvement of the library	None	None	None	578
For supplies used in the clinical departments	7,214	6,718	5,192	6,010
For salaries: for administration	9,075	8,348	8,528	13,143
For salaries: for teaching	48,268	43,654	43,600	79,043
For all other purposes	19,890	11,528	12,262	15,141
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(28)	(30)	(26)	(26)
Amount of their salaries as teachers	23,512	21,183	21,510	45,905
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	2,500	2,500	3,500	3,500
Smallest salary paid to a whole-time teacher of a dental subject	2,500	2,500	3,500	3,000
(Number of teachers of academic or medico-dental subjects) ²	(15)	(14)	(14)	(28)
Amount of their salaries as teachers	24,756	22,471	22,090	33,138
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	1,500	2,000	3,500	5,000 ³
In the Medical School	4,250	4,500	4,750	5,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,000	1,150	1,750	3,000

¹ The surplus received by the University exceeded the amount of the direct appropriation.

² Since September, 1923, the medico-dental subjects have been taught in the laboratories of the Medical School.

³ Paid to a teacher of dental students in the Medical School.

to base its curriculum on two years of study in an academic college, the Columbia School having been the first. With each advance in the entrance requirement there was a fall in attendance, as is usually the case when standards of admission are raised while good schools remain on lower scholastic foundations, but recovery is already in progress (page 469). Since 1924 the curriculum has been adjusted to a "two-two-two-plan," that is to say, two years of approved work in an accredited academic college are required for admission; two years are reserved for courses in "medicine," chiefly in the medical sciences, which are being adapted in their content to the needs of the dental students; and two years are devoted to "dentistry," mainly to its technical and clinical aspects.¹ In 1924-25, the concluding two years were increased to fully two and one-third academic years. Although this change has made the Buffalo curriculum the longest in North America, the calendar extension is a temporary condition of the School's effort to determine whether the academic year can be advantageously lengthened for the intensive study of dentistry.

Until recently, the Medical and Dental Schools failing to cooperate, the medical sciences were taught to students of dentistry in rented rooms in a private building situated a half-mile from the dental building. Since 1923, however, the Medical Faculty has actively assisted the Dental Faculty by teaching the medico-dental sciences to dental students in the medical building, and the Dental School has been steadily increasing its effort to improve the instruction of its students in the correlations between clinical dentistry and clinical medicine. Since 1924 the Medical School has been one of very few to indicate, in the annual Announcements, the nature of the courses given to dental students by medical teachers. The Medical School, however, does not give its students formal instruction in odontology, stomatology, or clinical dentistry, although its curriculum contains the usual reservations of hours for specialties of health service. Oral surgery receives passing attention in the lectures on surgery. Hospital relationships, first established for the Dental School in 1924-25, are growing steadily more useful. At present (1925-26), the Dean of the Dental School is the Consulting Odontologist and two members of the Dental Faculty are Attending Odontologists at the Buffalo General Hospital, and three members of the Dental Faculty are Attending Dental Surgeons or Attending Orthodontists at the Children's Hospital of Buffalo, with both of which hospitals the Medical School cooperates intimately.

The School is now being conducted at a heavy financial loss to the University, which will probably continue until special funds are provided. Despite the decrease in attendance, the equipment has been expanded, the number of teachers increased, and the instruction improved. The Faculty has been restricting its effort to the work for undergraduates, but has begun to give attention to research. During the past two years, \$1100 has been paid for the improvement of the library, which had been neglected. The School is urgently in need of gifts for general maintenance and development, including support for the service of a larger number of whole-time teachers, and for the payment of adequate salaries. Nearly all of the students (96-98 per cent) reside in the State of New York. In 1924-25, of 132 students only 5 were non-resident—3 in Pennsylvania, and 2 in Connecticut. Comparative data relating to students and graduates are presented on page 469; to results of license examinations, on page 480.

NEW YORK CITY

Population: 6,059,444. Number of dentists, 6624; physicians, 10,768. Ratios: dentists to population, 1:915; physicians to population, 1:563; dentists to physicians, 1:1.6
Number of dental clinics or infirmaries, 104; hospitals, sanatoriums, and charitable institutions, 159; hospitals approved for internships, 26

Dental Schools: (1) New York University; (2) Columbia University. *Medical Schools*

¹ This School has received special permission from the Regents to depart from the rule of uniformity (page 478).

(5): Columbia University, Cornell University, New York University, New York Homeopathic Medical College and Flower Hospital, and Long Island College Hospital (Brooklyn)

(1) NEW YORK COLLEGE OF DENTISTRY

Special note. On June 29, 1925, this College became an integral part of New York University, and is now the School of Dentistry of that University. The appended data apply, in the main, to the status of the College before its union with the University. Recent developments in the reorganization of the School are indicated in the Summary (page 452) and in the Appendix

Location: 205-213 East Twenty-third Street (Manhattan); one and one-half miles from the intersection of Fifth Avenue and Forty-Second Street

General character: independent and non-proprietary. The students receive laboratory instruction in general anatomy in the building of the New York University and Bellevue Hospital Medical College (five blocks), by special agreement with that Medical School

Organized: in 1865

Buildings: two, side by side; erected, respectively, in 1890 and 1900, and remodeled in 1917 and 1918; special improvements were made in 1923 and 1924; total floor area, 74,375 sq. ft.

Infirmary: with six accessory rooms; total floor area, 12,608 sq. ft. Total number of chairs in active use, 138, including groups reserved for special purposes: prosthodontia, 36; orthodontia, 22; oral surgery, 9; extraction, 3; examination, 2

School of Medicine: associated with none, except as indicated above under "General character." See "Special note," above

Dispensary or Hospital in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: none

Library: room, 1341 sq. ft.; whole-time librarian. Contains 1700 bound and 6750 unbound volumes, and 172 pamphlets (not effectively card indexed). Of the volumes, approximately 50 per cent relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Library of the New York Academy of Medicine, which includes the Library of the First District Dental Society of the State of New York (one and one-half miles); not in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Acting Dean: whole-time officer; also Adjunct Professor of Dental Materia Medica, Pharmacology, and Therapeutics; Director of the Afternoon Oral Surgery Clinic; and Consulting Dental Surgeon for the Infirmery. *Associate Dean* (or equivalent officer): none. *Acting Dean's executive assistant:* whole-time secretary

Minimum academic requirement for admission to the first-year class, in September, 1924; one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: two years of approved work in an accredited academic college, beginning in September, 1926

Number of graduates (1867-1925): 4375; average per year, for fifty-nine years, 74

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 692; proportion from the State of New York: 1922-23—90 per cent; 1923-24—89 per cent; 1924-25—88 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—37,105; 1921-22—40,803; 1922-23—46,168; 1923-24—45,385; 1924-25—36,992

Number of visits, sittings, or operations: 1920-25—no available data

Rated Class B by the Dental Educational Council of America (1918); new rating postponed since July 1, 1923, pending prospective union with New York University and consequent reorganization

FINANCIAL DATA

Estimated value of land and buildings, \$203,030, and equipment, \$62,734; total, \$265,764 (June 30, 1925)

General debt on the School (June 30, 1925): none

Accumulated net assets (June 30, 1925): \$318,630. This is the value of the property conveyed by the College to New York University on June 29, 1925

	(1)	(2)	(3)	(4)
Data for years ending on May 31	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$190,870	\$182,253	\$181,390	\$172,377
Fees paid by patients, in all clinical departments	56,068	68,226	93,660	86,624
Interest on investments	3,991	4,685	7,002	4,321
Miscellaneous receipts	3,476	1,846	3,911	6,269
Total amount of current income	\$254,405	\$257,010	\$285,963	\$269,591
<i>Total amount of current expenditures</i>	\$224,685	\$217,487	\$233,958	\$233,368
Net income for the year	29,720	39,523	52,005	36,223
Amount of accumulated surplus	148,020	167,913	219,390	256,896
<i>Capital income:</i>				
Money borrowed during the year	\$20,000	None	None	None
Deposit on and additional receipt from sale of property (42d Street) owned by the College	None	None	\$5,000	\$48,516
Total amount of capital income	\$20,000	None	\$5,000	\$48,516
<i>Capital expenditures:</i>				
For reduction in principal of debt	\$53,500	\$27,500	\$22,500	\$63,750
For commission on sale of property (42d Street) owned by the College	None	None	2,025	None
For new construction (no land)	None	None	None	10,462
Total amount of capital expenditures	\$53,500	\$27,500	\$24,525	\$74,212
Average amount expended by the School per student (D.D.S.) per year	293	307	344	368
Average amount of all student fees paid to the School per student (D.D.S.) per year	262	257	266	271
<i>Details of current expenditures:</i>				
For interest on debt	8,785	8,203	7,144	4,113
For rent	None	None	None	None
For repairs	24,524	21,715	40,244	14,648
For new equipment				
For research	None	None	None	None
For improvement of the library	None	None	500	None
For supplies used in the clinical departments	15,908	16,500	22,323	21,755

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income by gift; and all miscellaneous receipts are included in the recorded items above. See "Capital income," below.

	(1)	(2)	(3)	(4)
Data for years ending on May 31	1920-21	1921-22	1922-23	1923-24
For salaries: for administration	\$16,095	\$17,268	\$18,556	\$19,968
For salaries: for teaching	68,590	77,279	98,135	108,666
For all other purposes	90,783	76,522	47,056	64,218
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(42)	(45)	(59)	(51)
Amount of their salaries as teachers	33,930	40,619	64,680	58,705
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	5,000	5,000	5,000	5,000
Smallest salary paid to a whole-time teacher of a dental subject (8 months)	640	640	720	720
(Number of teachers of academic or medico-dental subjects)	(11)	(11)	(13)	(11)
Amount of their salaries as teachers	34,660	36,660	33,455	49,961
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	9,300	9,300	9,300	9,300
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	3,000	3,000	2,425	3,000

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 62. Of this total number, 2 were whole-time, 6 half-time, and 3 part-time or occasional teachers of academic or medico-dental subjects; 10 were whole-time, 33 half-time, and 8 part-time or occasional teachers of dental subjects; 5 were "full" professors; 7 were associate, assistant, or clinical professors; 5 were lecturers by title; 1 received no salary; 9 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Advanced courses for dental practitioners: since 1916; attendance: 1921-22—43; 1922-23—24; 1923-24—31; 1924-25—45

STUDENTS AND GRADUATES: NEW YORK COLLEGE OF DENTISTRY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	529	616	793	720	694	649
Women.....	0	0	0	0	0	0
From other countries.....	0	0	2	2	1	0
Negroes.....	2	1	0	0	0	2
Attendance at the end of the year.....	464	608	766	708	681	635
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	0	5	8	10	4	4
From other countries, to advanced standing.....	0	0	2	2	1	1
"Repeaters" of one or more subjects.....	72	20	24	19	14	10
Denied further instruction because of deficient scholarship.....	1	3	6	10	6	2
GRADUATES (D.D.S.)						
Total number of graduates.....	231	67	138	109	220	260
Women.....	0	0	0	0	0	0
Admitted to practice in other countries.....	No available data					
Negroes.....	1	1	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	2	3	4	3	3	3
Percentages of failures in such state-board examinations.....	31.0	27.9	27.2	43.6	29.2	29.0

Summer courses in clinical dentistry (June, July, August, and September): since 1867; attendance: 1922—66; 1923—60; 1924—93; 1925—50

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no dental extension teaching

Research: actively in progress in 1924–25. *In the Department of Physiology*: on reciprocal innervation in the frog; reciprocal innervation as a possible local mechanism in the frog; histology of the peridental membrane; embryological differentiation of enamel; effects of nitrous oxide on various animals; effect of novocain on the irritability and conductivity of motor nerves; physiological relationships with oral surgery. *In the Department of Orthodontia*: on gnathastatic and photostatic diagnosis, to determine the kind and degree of abnormality of the teeth compared with the skull as a whole. Several publications from the Department of Physiology in 1924 and 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: January, 1922; March, 1923; May and December, 1924; June and December, 1925
The foregoing data have been verified in detail by the Dean

SUMMARY

THIS School, which had long been an overcrowded and poorly equipped independent institution,¹ was conducted in the spirit of a proprietary college, and had most of its infirmities. Lately made an integral part of New York University, the School is now being actively reorganized (December, 1925) under the leadership of a new dean, who, although not a dentist, is the university professor of physiology and the assistant dean of the Medical School. He is widely experienced in the work of health-service education, and has a long record of useful public service as a teacher of a fundamental science and as an investigator in his field. For a decade he was Secretary and then President of the Society for Experimental Biology and Medicine, which since 1903 has been a potent influence for the promotion of biological and medical research in North America. The University's commendable action in selecting, for the office of Dean of the School, one whose qualifications are primarily educational is unique in the history of dental education (page 142).

The initial main improvements in the reorganization of the School include limitation of each new class to a maximum of 150 students, and marked betterment in the teaching of the medical sciences. Whole-time staffs have been organized in the departments of anatomy, bacteriology, chemistry, pathology, and physiology, with one-half of the time of the teachers free for research. The courses in these departments are practically identical in length with those given to the medical students, but have been adapted for special emphasis on the phases that are essential in the study of dentistry. The chemical laboratory has been modernized and fully equipped. At present anatomy and bacteriology are taught by members of the Medical Faculty in the laboratories for these subjects in the Medical School (five blocks); chemistry, histology, pathology, pharmacology, and physiology are taught in the laboratories in the dental building by members of both the Medical and Dental Faculties. Courses in the principles of surgery, in general medicine, and in diseases of the mouth, are given by the heads of the corresponding departments in the Medical School. Lectures and cadaver work on conductive anesthesia of the head and neck are taken by junior students. In the oral clinic a neurologist conducts a sub-clinic for patients having neurological lesions that simulate dental disorders. The School is receiv-

¹ The laboratory of physiology, one of the best in dental schools, was a striking exception in the matter of equipment.

Jarvie Fund, which had been established in 1916 and which, originally \$125,000, now amounts, with accrued interest, to \$131,650. The maximum amount of expenditures for a given year was \$25,150, in 1922-23, of which \$16,585 was appropriated directly by the University, \$6632 was paid in fees by students, and \$933 was paid in fees by patients. Of the total of 66 teachers in 1922-23, none gave whole-time service in the Dental School and 34 teachers of dental subjects received no salaries. In 1917 the *New York Post-graduate School of Dentistry*, which had been equipped for its projected work and was about to receive its first students, and the *New York School of Dental Hygiene* (page 76) were absorbed by the University and their courses continued in affiliation with the School of Dentistry under the administrative auspices of University Extension. Additional data are given in the footnote with the table of data regarding "Students and graduates," on page 459

In 1852 the Legislature of the State of New York incorporated the *New York College of Dental Surgery*, to be located in Syracuse, "for the purpose of promoting dental science and instruction in the departments of learning connected therewith." This School, established informally in 1851 and chartered in 1852, continued until 1855, when its property was destroyed by fire and its activity terminated. In 1879, the law that incorporated the New York College of Dental Surgery was amended in various particulars: the specified location of the College was made New York instead of Syracuse, and the name changed from New York College of Dental Surgery to *New York State College of Dental Surgery*. This School failed to function, however, until 1904, when its Trustees induced those of the *New York Dental School* (1893-1904) to unite the two institutions. The Regents of the University of the State of New York then amended the charter of the New York State College of Dental Surgery to permit the proposed consolidation, and changed the name of the College to *New York College of Dental and Oral Surgery*. The authority of the Regents of the University of the State of New York to amend a statutory charter was seriously questioned, however, and the New York College of Dentistry (founded in 1865) formally objected to the adoption of a new corporate name, so closely similar to its own. Consequently, in 1905, the Legislature again amended the charter granted in 1852, and first amended in 1879, by giving the College the added power "to affiliate or consolidate with any university or any other dental college or dental school of this State," and expressly authorizing and ratifying the union with the New York Dental School, which had been effective informally from the summer of 1904. The name conferred upon the College, in the amended charter, was *College of Dental and Oral Surgery of New York*. This name and status were retained until the amalgamation of the College with the School of Dentistry of Columbia University, as indicated above (July 1, 1923). This amalgamation was directly ratified by a supplementary act of the Legislature that became a law on April 12, 1924

Buildings: two; those of the former College of Dental and Oral Surgery of New York.¹ The main building was erected in 1913; special improvements were made in 1921; floor area, 32,612 sq. ft. A large annex, erected in 1922 and situated in the rear of the main building, with an entrance at 309 East Thirty-fourth Street, is connected with that building by a bridge on each floor; floor area, 35,456 sq. ft. Total floor area in both buildings, 68,068 sq. ft. Distance from the main site of the University, five miles; and from the buildings of the School of Medicine, two and one-fourth miles

Infirmary: in the dental building, with three accessory rooms, total floor area, 10,560 sq. ft. Total number of chairs in active use, 164, including groups reserved for special purposes: prosthodontia, 40; oral hygiene, 24; orthodontia, 6; examination and roentgenography, 5 each; oral surgery and demonstration, 4 each; research, 1

¹ The net value of the buildings and equipment, as conveyed to the University by the College, was \$445,185.59—the largest gift to the University in 1923-24.

Relation of the School of Medicine (Class A): all of the medico-dental subjects except physiology are taught, in the laboratories of the Medical School, to dental students in separate classes (with medical students at some of the lectures), by members of the Medical Faculty. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Dispensary or Hospital in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: none. Before the amalgamation with the College of Dental and Oral Surgery of New York, students of the School of Dentistry of Columbia University were given clinical instruction at the Vanderbilt Clinic (Medical School) and the Presbyterian Hospital (one and one-half miles), where they attended clinics in oral surgery and exodontia, but performed no clinical service. The students of the College of Dental and Oral Surgery of New York did not receive clinical instruction or perform clinical service in an allied dispensary or hospital

Library (main building): room, 2040 sq. ft.; whole-time librarian. Contains 1930 bound and 6640 unbound volumes, and 1500 pamphlets (all of the volumes are effectively card indexed). Of the volumes, practically all relate to dental subjects. (Opened in January, 1925)

Library facilities additional to those in the dental building that are conveniently accessible to dental students: New York Public Library—branch (opposite); Library of the School of Medicine (two and one-fourth miles); Library of the New York Academy of Medicine, containing the Library of the First District Dental Society of the State of New York (one and one-fourth miles); none in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: three students; total amount, \$1066, of which none was provided by the School. The beneficiaries were ex-service men, under the auspices of the U.S. Veterans Bureau

Dean (Director): whole-time officer; also Professor of Clinical Dentistry. *Associate Dean* (since November, 1925): part-time officer; also Professor of Orthodontia. *Dean's executive assistants*: whole-time secretary and whole-time assistant secretary

Minimum academic requirement for admission to the first-year class in September, 1924: two years of approved work in an accredited academic college (since 1924)¹

Next prospective advance in the minimum academic requirement for admission: none under consideration

Number of graduates (1924 and 1925): 253; average per year, for two years, 126. (Number for the *College of Dental and Oral Surgery of New York*, 1906-23—1620; average per year, for eighteen years, 90. Number for the *New York Dental School*, 1894-1905—163; average per year, for twelve years, 14. Total number for the *School of Dentistry of Columbia University*, 1922 and 1923—5)

Average total attendance, per year (at the end of the year), for two years (1924 and 1925): 451; proportion from the State of New York in 1923-24—88 per cent; 1924-25—85 per cent. At the *College of Dental and Oral Surgery of New York* (1914-23): 581; proportion from the State of New York in 1922-23—88 per cent. At the *School of Dentistry of Columbia University* (1919-23): 11; proportion from the State of New York in 1922-23—90 per cent

¹ In 1923, the original Columbia requirement of two years of approved work in an accredited academic college could not be exacted of the prospective first-year students who, prior to the date of the amalgamation, had been admitted to the College of Dental and Oral Surgery of New York on a one-year requirement, which had been the minimum at that College since 1921 (see "Organized," above). Therefore, the Columbia minimum requirement was unavoidably lowered, for 1923-24, to one year of work in an academic college.

Clinical service of the Dental School in the instruction of students:

Number of persons treated at the *College of Dental and Oral Surgery of New York*: 1920-21—11,390; 1921-22—10,461; 1922-23—11,681. At the *School of Dental and Oral Surgery of Columbia University*: 1923-24—22,302; 1924-25—21,567. At the *School of Dentistry of Columbia University*: 1920-21—no available data; 1921-22—55; 1922-23—184

Number of visits: 1920-23—no available data. At the *School of Dental and Oral Surgery of Columbia University*: 1923-24—66,906; 1924-25—65,664, including 957 for treatment in orthodontia¹

Rating by the Dental Educational Council of America.—*College of Dental and Oral Surgery of New York*, Class B (1918); re-rating on July 1, 1923, was suspended pending reorganization after union with the *School of Dentistry of Columbia University*. *School of Dentistry of Columbia University*: postponed in 1918, and thereafter, pending completion of the organization of the School. *School of Dental and Oral Surgery of Columbia University*: postponed since the amalgamation on July 1, 1923, pending completion of the reorganization of the united schools

FINANCIAL DATA

Estimated value (Dental School) of land and buildings, \$365,591, and equipment, \$60,654; total, \$426,245 (June 30, 1925)

General debt on the School (June 30, 1925): \$112,500 at 5 per cent interest per annum

Data for years ending on June 30	(1)	(2)	(3)	(4)
	1920-21	1921-22	1922-23	1923-24
	College of Dental and Oral Surgery of New York ²			Columbia
<i>Current income:</i> ²				
Fees (all kinds) paid by the students	\$151,266	\$134,174	\$151,076	\$155,782
Fees paid by patients, in all clinical departments	33,066	31,333	40,477	27,292
Endowment	None	None	None	6,550
Gifts	None	None	342	None
Miscellaneous receipts	8,236	6,904	1,587	6,131
University funds, additional to the income designated above:				
(a) Direct appropriation	...	...	...	13,219
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	...	...	...	20,000
Total amount of current income	\$192,568	\$172,411	\$193,482	\$228,974
Total amount of current expenditures	\$147,570	\$141,512	\$156,489	\$228,974
Net income for the year	44,998	30,899	36,993	None
<i>Capital income:</i> ⁴				
Net current income	\$44,998	\$30,899	\$36,993	...
Borrowed	None	125,000	None	None
Total	\$44,998	\$155,899	\$36,993	None

¹ The Clinic in Orthodontia is operated continuously throughout the calendar year. The students receive instruction, but do not participate in the operations or treatments.

² During the academic years 1920-23 (College of Dental and Oral Surgery of New York) and 1923-24 (School of Dental and Oral Surgery of Columbia University), there was no appropriation by the State or City, and all miscellaneous receipts are included in the recorded items above. See "Capital income," below.

³ United with the School of Dentistry of Columbia University on July 1, 1923; since that date, with the latter, the School of Dental and Oral Surgery of Columbia University.

⁴ The total amount of accumulated surplus on June 30, 1920, was \$371,053. The net value of the property conveyed to Columbia University, on June 30, 1923, was \$445,186.

NEW YORK: NEW YORK

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	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Capital expenditures:</i> ¹				
For reduction in principal of debt	None	None	\$5,000	...
For new construction (no land)	None	\$227,183	None	None
Total	None	\$227,183	\$5,000	None
Surplus	\$44,998	...	31,993	...
Deficit	...	71,284	...	None
Accumulated surplus ¹	416,052	344,768	376,761	...
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	...	...	...	28,342
Average amount expended by the School per student (D.D.S.) per year	222	256	260	430
Average amount of all student fees, paid to the School per student (D.D.S.) per year	227	243	251	293
<i>Details of current expenditures:</i>				
For reduction in principal of debt	...	...	...²	None
For interest on debt	None	2,238	10,425	None
For rent	None	None	None	None
For repairs	1,599	5,776	25,671	None ³
For new equipment				
For new construction (or land)	None	None ²	None	None
For research	None	None	None	2,000
For improvement of the library	None	None	None	None
For supplies used in the clinical departments (including new equipment in 1923-24)	No available data			26,000
For salaries: for administration	13,626	20,419	30,136	25,700
For salaries: for teaching	84,748	78,691	84,689	134,000
For all other purposes	47,597	34,388	5,568	41,274
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(59)	(57)	(40)	(116)
Amount of their salaries as teachers	No available data ⁴			111,000
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(32)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	5,500	5,500	5,500	4,500
Smallest salary paid to a whole-time teacher of a dental subject	5,000	5,000	5,000	4,500
(Number of teachers of academic or medico-dental subjects)	(11)	(14)	(23)	(8)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	No available data ⁴			23,000
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School (dental budget)	6,000	6,000	6,000	4,500
In the Medical School (medical budget)	...	...	...	12,000

¹ The total amount of accumulated surplus on June 30, 1920, was \$371,053. The net value of the property conveyed to Columbia University, on June 30, 1923, was \$445,186.

² See "Capital expenditure," above. ³ The equipment of the two Schools was combined.

⁴ The College of Dental and Oral Surgery of New York seriously neglected the medico-dental subjects. Many hours of laboratory instruction, specified in its Announcement as part of the curriculum, by which it met the minimum requirements of the Regents of the University of the State of New York, were not given to the students.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	\$5,000	\$5,000	\$5,000	\$4,500
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	...	...	...	10,000

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 85. Of this total number, 1 was a whole-time, 6 were half-time, and 24 part-time or occasional teachers of academic or medico-dental subjects; 3 were whole-time, 22 half-time, and 29 part-time or occasional teachers of dental subjects; 4 were whole-time teachers in the Dental School only; 6 were "full" professors; 25 were associate, assistant, or clinical professors; 2 were lecturers by title; 14 received no salaries; 41 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. or B.A. and D.D.S.: since 1916;¹ now six years (B.S.) and seven years (B.A.) in length

Course for dental hygienists: at Columbia,¹ by the department of University Extension, since 1916;² attendance: 1921-22—49; 1922-23—54; 1923-24—44; 1924-25—36

To facilitate comparison with the Schools for Dental Hygienists in the Forsyth Dental Infirmary (page 389) and the Rochester Dental Dispensary (page 465), the number of graduates in oral hygiene at Columbia is given here (including the number now in attendance):

1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	Total
93	33	7	27	35	48	54	44	36	46	423

Advanced courses for dental practitioners: at Columbia,¹ by the department of University Extension, from 1917 to 1924; temporarily discontinued in 1924; attendance: 1921-22—148; 1922-23—121; 1923-24—10. Some of these were given during the summer of each year

Dental extension teaching: at Columbia,¹ since 1916 (see last two preceding items)

Summer courses in clinical dentistry. At the *College of Dental and Oral Surgery of New York* (June and July, and September): 1906-1922; attendance: 1921—100; 1922—100 (the figures are estimates); 1923—94. At the *School of Dental and Oral Surgery of Columbia University* (June and July, and September): 1924—86; 1925—6; none at Columbia before 1924, except advanced courses as noted above

No course for dental mechanics, assistants, or technicians; no graduate course in dentistry

Research: actively in progress in 1924-25, on the relation between diet and tartar formation; influence of diet in pregnancy on dentition; chemical qualities of salivary mucin; structure of enamel, including proof of the presence of protein matter; effects of "ionization" and of different substances in the root canals of devitalized and septic teeth; several publications in 1924 and in 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service³

No effort has been made by the School to determine recurrently the quality of the instruction as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research³

¹ None at the College of Dental and Oral Surgery of New York.

² The first course for dental hygienists in a university (page 76).

³ This applies to the College of Dental and Oral Surgery of New York, to the School of Dentistry of Columbia University, and to the School of Dental and Oral Surgery of Columbia University.

STUDENTS AND GRADUATES: COLLEGE OF DENTAL AND ORAL SURGERY OF NEW YORK (1918-23);
SCHOOL OF DENTAL AND ORAL SURGERY, COLUMBIA UNIVERSITY (1923-24)¹

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
College of Dental and Oral Surgery of New York						
Maximum attendance.....	589	539	673	566	620	547
Women.....	50	36	44	31	36	32
From other countries; chiefly from Russia.....	0	0	0	2	13	11
Negroes.....	12	14	20	19	17	6
Attendance at the end of the year.....	502	531	665	552	601	532
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	2	5	7	11	27	2
From other countries, to advanced standing.....	0	0	1	1	13	2
"Repeaters" of one or more subjects.....	6	13	12	26	2	1
Denied further instruction because of deficient scholarship.....	0	0	0	0	0	7
GRADUATES (D.D.S.)						
Total number of graduates.....	204	44	187	115	171	165
Women.....	30	3	14	9	12	10
Admitted to practice in other countries.....	No available data					
Negroes.....	2	0	4	6	9	3
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	2	3	3	4	2	2
Percentages of failures in such state-board examinations.....	27.6	16.0	18.2	37.1	38.9	33.9 ²

Visited: College of Dental and Oral Surgery of New York—*January and June, 1922; January, May, and June, 1923.* School of Dentistry of Columbia University—*January, 1922; January and June, 1923.* School of Dental and Oral Surgery of Columbia University—*July, 1923; May and December, 1924; September and December, 1925*

The foregoing data have been verified in detail: for the College of Dental and Oral Surgery of New York, by the Dean; for the Columbia schools, by the Director

SUMMARY

THIS School, in continuance of the original plan at Columbia and unlike any other dental school except that at Harvard, is conducted by a special Administrative Board composed of the Director of University Extension, the Dean of the Medical School, and five professors of dental subjects of instruction, one of whom is Chairman of the Board and the chief executive of the School ("Director"). The original Columbia School (1916-23) was the first that required two years of approved work in an accredited academic college for admission, and throughout the period of its existence was the only one to do so. It was also the first dental school that cooperated in the training of dental hygienists (page 76). Since 1923 the School has been in effect a combination of the spirit of the original Columbia School (1916-23) in the body of the College of Dental and Oral Surgery of New York (1905-23), the university School having been moved into the buildings of the independent College, and the two original names replaced by one intended to memorialize that of the older unit in the amalgamation. For these special reasons the compilation of the foregoing

¹ Analogous data for the School of Dentistry of Columbia University, 1916-18.—There were two students in 1916-17, two in 1917-18. Each of these became a student of medicine at Columbia and received the degree of M.D. in 1920. One then reentered the School of Dentistry and in 1922 received the degree of D.D.S. 1918-23.—Maximum attendance, successively 0, 4, 8, 14, and 20; one woman in each of the last three years; no student from another country; one negro student in 1920-21 who failed to return in 1921-22; attendance at the end of the year was one less than the maximum in each of three years. No student was admitted by examination, two were admitted to advanced standing, none repeated a course, and two were denied further instruction because of deficient scholarship. In 1922 there was one graduate; in 1923, four, of whom one was a woman. The first graduate passed his initial license examination; one of the four graduates in 1923 failed to pass.

² The official report of the results of state-board examinations, for 1924, gives the total number of graduates of the Columbia University School of Dentistry for that year as 186, and the number examined as 174; but there were only 165 graduates in 1924. The cumulative record in the same report gives 179 as the total number of Columbia graduates (1922-24), and 178 as the number examined; but the total number of graduates was only 170.

statistical statement has been based, in the main, on the data pertaining to the independent College. In 1922 the College of Dental and Oral Surgery of New York had become so seriously deficient that, under the insistence of the Dental Educational Council, union of the College with a university was recognized as the best practical means of reorganization (page 477). The school then existing at Columbia, which pending further development had not been classified by the Council and in 1923 had only nineteen students in its four classes, also failed to receive the Council's public approbation.¹ The consolidation of the two schools not only was mutually helpful, therefore, but also promised to improve Columbia's opportunity in dental education, and was consummated under conditions of general gratification and widespread expectation among dentists. Marked improvement in educational quality, under the guidance of several well-paid teachers of unusual ability and broad experience in dental education, was the chief requisite at the beginning and continues to be the School's outstanding need. The readiness of the Trustees of the University to provide funds for the development of the School, so far as available resources permit, has been shown by their financial provisions for recent improvements.

Since the union of the Schools, reorganization has been actively in progress under the guidance of the Director who, at the time of the consolidation, was the part-time Director of the Columbia School, but is now giving the School whole-time service. The comfort of the students has been greatly increased; the physical facilities have been transformed and readjusted advantageously; a library and a museum have been instituted; an elaborate photographic equipment superior to that in any other dental school, for the ready production of teaching accessories and for use in research, has been installed; and the visible adjuncts in general have been brought to a much higher degree of usefulness for their intended purposes. The Courses in Oral Hygiene, which have been conducted by the Department of University Extension since 1916, are given with the coöperation of the Dental School and under the supervision of the Professor of Preventive Dentistry. The Dental Faculty restricts its attention to undergraduate instruction, has shown no interest in graduate work, and with one or two notable exceptions is inactive in research—conditions that will probably continue until a larger number of whole-time teachers of dental subjects are added to the Faculty. In 1924-25, the total amount of the salaries of 54 teachers of dental subjects, three giving whole-time service, was \$71,450—but \$21,480 was expended in salaries for administration.

Although the School now occupies buildings that are situated more than two miles from the Medical School, the dental students receive instruction in the laboratories at the Medical School in all but one of the medical sciences, the geographical disadvantage of this coördination being outweighed by its educational benefits. The courses in these subjects have been adapted to the needs of the practitioner of dentistry, and with occasional exceptions have lately been taught to dental students in separate classes, the original Columbia plan of giving the united groups of medical and dental students identical instruction in the medical sciences having been abandoned. For reasons of convenience, physiology is taught in a laboratory in one of the dental buildings, by a former member of the Medical Faculty. The important services in dentistry and in oral surgery at the Presbyterian Hospital and the Vanderbilt Clinic, respectively, which have been developed independently of the Dental School, are not used to give the dental students instruction in the correlations between clinical dentistry and clinical medicine, in which the School needs strengthening. The Columbia Medical School gives the usual attention to the medical specialties but, like nearly all other American medical schools, does not offer analogous courses in odontology,

¹ For this reason, having received neither a Class A nor a Class B rating by the Dental Educational Council, the Columbia School, despite its previous membership in the Dental Faculties Association of American Universities, was ineligible for charter membership in the American Association of Dental Schools (1923). The rating of the united schools having been postponed since 1923, the School has not yet been admitted to membership in the Association (April, 1926).

stomatology, or clinical dentistry, although at the Vanderbilt Clinic oral surgery is included informally in the instruction of medical students in surgery.

In 1923, at the time of the union, the entrance requirement of the Columbia School was two years of approved work in an accredited academic college. At the College of Dental and Oral Surgery of New York the requirement was one year, the minimum then sanctioned by the Regents, but it had been given evasive enforcement. In 1923, before the date of the consolidation, a large number of first-year students had already been formally admitted to the College of Dental and Oral Surgery on the lower requirement. Some of these students were accepted on the authority of "dental student certificates" which had been issued by the State Department of Education before a year of approved work in an accredited academic college was required for admission to registered dental schools, but which the Department had not made automatically invalid with the lapse of the earlier standard.¹ Consequently, for the year 1923-24, the Columbia entrance requirement had to be lowered accordingly, but, beginning in 1924-25, it was again raised to two academic years and has been strictly enforced as to time. Unfortunately, however, a large proportion of the students who since 1924 were admitted on this higher standard had inferior scholastic records at the academic colleges, and would not have been acceptable at the best dental schools or at good medical schools. Dental schools that enforce the two-year pre-dental academic requirement do so presumably for the purpose of giving dentistry the same scholastic foundation as medicine. Obviously, however, this objective may not be attained, if the length of time spent in an academic college, rather than the character and quality of the intellectual achievement, is the primary criterion of admissibility. Medical schools, tending to become overcrowded, are selecting the applicants who show the highest intellectual attainments. A condition that would generally encourage students who have been rejected at medical schools to go resignedly to dental schools, as a second choice, might prove to be very detrimental to the morale of dentists and to the development of oral health-service. Dental schools should be alert to the consequences of such a demoralizing tendency. The two-three-graduate plan, if administered to include extra work in mechanics, fine art, and oral hygiene during the two-year preparatory period, would effectually test both interest and aptitude, and a student's capability for dentistry would be revealed or his ineptitude shown to himself so convincingly during the academic period that, as a rule, oral health-service would be an assured preference of those who sought admission to dental schools.

In 1924, the percentage of the School's graduates who failed at their first attempts to pass license examinations was higher than that for any other dental school in the United States (33.9 per cent). A clue to the reasons for this outcome is suggested by the fact that in 1923-24 only seven students in a maximum total of 547 were denied further instruction because of deficient scholarship on the "standard instruction" that was specially mentioned on page 15 of the annual Announcement for that year, and only one student was obliged to repeat a course. In 1924-25, when the total attendance was 379, the graduates were among the first of the students who had been admitted on the requirement of one year of approved work in an accredited academic college, and presumably also were better able to teach themselves. In that year, when accordingly the percentage of failures in license examinations, although high (17.9 per cent), was much lower than in 1924, the number of students who were required to repeat at least one course rose to twenty-one, but only three students were denied further instruction because of deficient scholarship.

As a consequence of the decrease in income from fees owing to the steady fall in attendance, and of the increase in salaries and in the costs of operation in general, the School is now being conducted at a cumulative financial loss. The reorganization of the united schools has been embarrassed not only by the deficiency of experienced teachers devoted

¹ In 1923, the official representative of the Regents ruled that students who had presented out-of-date certificates, and therefore had been admitted improperly, should nevertheless be allowed to remain in good standing.

primarily to the work of the School, to which allusion has already been made, and by the decline in current income, but also by the lack of adequate endowment, by the distances from the Medical School and the associated Hospital, and by the general discouragement arising from the University's inability to obtain funds sufficient for the reconstruction of the School in the new Health Centre now being rapidly created at Broadway and West 168th Street (April, 1926). This great Centre will include the Medical School, the Presbyterian Hospital, and other important health-service institutions in towering buildings that will cost many millions of dollars, and may be ready for occupancy by the Medical School and other components in the spring of 1928. Fortunately, the plans for the new buildings include prospective extensions for the Dental School, which will be built as soon as funds for the purpose can be obtained.

The removal of the Medical School, Hospitals, and Out-patient Departments to the new site, and the continuance of the Dental School in its present buildings, by increasing to nearly eight miles the distance that now separates the two Schools, would terminate their coöperation and make it practically impossible for Columbia to give the dental students adequate training in the medical sciences and in oral medicine. Isolation of the Dental School would invalidate the effort to conduct it in accordance with modern university requirements, and would handicap the work of the School so seriously as to make it inexpedient for the University to continue it. The predicament of the University and of the Dental School in this situation should appeal not only to the self-interest but also to the altruism of the New York public. Without a first-class dental school the new Health Centre, which should be one of the best, would be unable to give to the metropolitan community a complete measure of health service. Without a good dental school and infirmary, the Centre could not attain the exceptional degree of general usefulness in humanitarian education and research that the donors of the enormous sums of money already allotted to its development have regarded as the primary motive of their philanthropy.

The accompanying data for the geographical distribution of the students, in 1924-25, in-

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT COLUMBIA UNIVERSITY: 1924-25

<i>States (3) and foreign countries (11)</i>	<i>First year¹</i>	<i>Second year²</i>	<i>Third year</i>	<i>Fourth year³</i>	<i>Total</i>
Finland	0	0	0	2	2
New Jersey	4	11	7	9	31
New York	30	98	130	65	323
Poland	0	1	0	1	2
Russia	0	0	3	8	11
Switzerland	0	0	2	0	2
Connecticut, Czechoslovakia, France, Germany, Greece, India, Ireland, Sweden— one each	1	1	1	5	8
Total	35	111	143	90	379

dicates that New Jersey is the chief source of the non-resident students, and that lately the number of admissions from foreign countries has been greatly reduced. Comparative data relating to students and graduates are given on page 469; to results of license examinations, on page 480.

ROCHESTER

Population: 315,245. Number of dentists, 280; physicians, 510. Ratios: dentists to population, 1:1126; physicians to population, 1:618; dentists to physicians, 1:1.8

¹ The entrance requirement of two years of approved work in an accredited academic college was again enforced.

² Chiefly students who were admitted to the College of Dental and Oral Surgery of New York, in 1923, before the union with the Columbia School.

³ The first group (College of Dental and Oral Surgery of New York) affected by the entrance requirement of one year of approved work in an academic college.

Number of dental clinics or infirmaries, 2; hospitals, sanatoriums, and charitable institutions, 16; hospitals approved for internships, 3

Dental School: University of Rochester. *Medical School*: University of Rochester

SCHOOL OF MEDICINE AND DENTISTRY, UNIVERSITY OF ROCHESTER

Location: School and Strong Memorial Hospital (same building): Elmwood Avenue and Crittenden Boulevard; one-fourth mile from Oak Hill, the site of the College of Arts and Science for Men soon to be erected, three miles from the main site of the University, and two miles from the centre of the city. Dental Infirmary (affiliated Rochester Dental Dispensary): 800 Main Street, East; three blocks from the main site of the University and three miles from the School of Medicine and Dentistry

General character: integral part of the University of Rochester. See "Relation of the School of Medicine," below

*Organized*¹: in 1925, on the foundation of gifts in 1920 of \$4,000,000 from Mr. George Eastman and of \$5,000,000 from the General Education Board, "for the purpose of establishing a school of medicine and dentistry of the highest order"; in 1920, of \$1,000,000 from Mrs. Gertrude Strong Achilles and Mrs. Helen Strong Carter for the erection of the Strong Memorial Hospital (230 beds); and in 1924, of \$1,500,000 additional from Mr. Eastman. The School of Medicine and Dentistry has begun its activities with property valued at \$4,000,000 and a productive fund in excess of \$10,000,000, which includes income accruing from the original gifts and profits from the sale of securities given by Mr. Eastman in payment of his contributions. The Municipal Hospital (200 beds) is now being erected on land donated to the city by the University adjacent to the Strong Memorial Hospital, with which it will be connected by corridors on all floors. The two hospitals will function as one. The Department of Vital Economics of the University is now housed in the School building and coöperates in the instruction in "alimentation, nutrition, and internal secretion." The Bacteriological Laboratory of the Rochester Department of Health will be situated in the School building and the work will be conducted under the direction of the professor of bacteriology

Closely affiliated with the School is the Rochester Dental Dispensary, which, founded in 1915 by Mr. Eastman, has an independent Board of Trustees and a building and endowment valued at \$2,500,000, and which, since 1916, has been conducting a School for Dental Hygienists. See "Rochester Dental Dispensary," below

Buildings: two. (1) The School and Strong Memorial Hospital are housed in the same building (400 × 400 feet, six floors), construction of which was begun in 1923. The northern half, containing the laboratories for the preclinical subjects, has been completed; the Hospital will soon be ready for occupancy. Total floor area: 295,000 sq. ft.—including laboratories for the medical sciences, 90,000 sq. ft.; Hospital and accessory rooms for clinical medicine, 68,000 sq. ft.; rooms used in common by the preclinical and clinical divisions, 20,000 sq. ft. (2) The Rochester Dental Dispensary (three miles from the School-Hospital building) was erected in 1916; total floor area, 33,000 sq. ft.

Infirmary (dental): in the Rochester Dental Dispensary; none in the School-Hospital building. See Rochester Dental Dispensary, below

Relation of the School of Medicine:¹ the school is a combined medical school and dental school. The medical and dental students will be given identical instruction in the same classes during the first two years; "the teachers will not know which students are dental and which are medical." During the last two years of the four-year curriculum for each group, the medical students will receive instruction in the Hospital, and will graduate

¹ Not yet rated by the Council on Medical Education. See the Appendix.

with the M.D. degree; the dental students will receive instruction in the Dispensary, and will graduate with the D.D.S. degree

Dispensary or Hospital in which dental students will receive accredited instruction or perform stated clinical service: Rochester Dental Dispensary. See the item next above

Number of dental internships or externships, held by officers or students of the School, in the Hospital in 1925-26: none; the Hospital is not yet in operation, but dental internes will be included in the staff

Library. School-Hospital building: reading-room, 1900 sq. ft.; stack room, 78,000 cu. ft.; one whole-time librarian and six part-time assistants. Contains 31,000 bound and 500 unbound volumes, and 4000 pamphlets (all effectively card indexed). Of the volumes, approximately 100 relate to dental subjects. Dispensary library: none; to be provided as the School develops

Library facilities additional to those in the School or Dispensary building that are conveniently accessible to dental students: University Library

Scholarships, fellowships, or similar financial assistance available to dental students: none; provision for such assistance will be made

Dean: whole-time officer; also Professor of Pathology. *Associate Dean:* whole-time officer; also Professor of Biochemistry. *Dean of Clinical Dentistry* (not a member of the Faculty of the School of Medicine and Dentistry): Director of the Dental Dispensary and Principal of the Dispensary's School for Dental Hygienists; whole-time officer

Minimum academic requirement for admission to the first-year class, in September, 1924: not yet organized; in September, 1925 (year of organization): three years of approved work in an accredited academic college. Number of candidates for the M.D. degree who were admitted in 1925: twenty-two. Maximum stated number of admissible candidates for the D.D.S. degree in 1925-26: twenty-five; number of dental applicants who qualified for admission: none

Next prospective advance in the minimum academic requirement for admission: none under consideration

Rating by the Dental Educational Council of America: none, pending development of the School

FINANCIAL DATA

Estimated value of the property: School and Hospital—land and building, \$3,700,000, and equipment, \$500,000; total, \$4,200,000. Dispensary—land and building, \$400,000, and equipment, \$100,000; total, \$500,000 (November 23, 1925)

General debt on the School, or carried by the University on the School's account (November 23, 1925): none

General endowment: \$10,000,000. Endowment available for dental education: a full share of the general endowment and of that for the Rochester Dental Dispensary

Salaries for instruction: a faculty for the instruction of dental students in the clinical years has not yet been organized. Among those who have been admitted to the School (1925-26) there are no prospective students of dentistry

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Combined curricula leading to the degrees of B.S. or B.A. and D.D.S., or M.D. and D.D.S.: none

School for dental hygienists: see the statement regarding the Rochester Dental Dispensary, below

No course for dental mechanics, assistants, or technicians; no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research (dental): none in progress in 1925; preparations are being made (December, 1925) to initiate a study of the etiology of dental caries

Number and classification of students in attendance in 1925-26 (November 23): total number, 22, all of whom are members of the first-year class and candidates for the M.D. degree, none for the D.D.S. degree; women, 2; from other countries than the United States, 1 (from Sweden); Negroes, none; admitted by certificate, without examination, all. See the Appendix

Visited: December, 1925

The foregoing data have been verified in detail by the Dean of the School of Medicine and Dentistry

ROCHESTER DENTAL DISPENSARY

(ASSOCIATED EDUCATIONALLY WITH THE UNIVERSITY OF ROCHESTER)

General data. Since 1916 the Rochester Dental Dispensary has been conducting oral health-service for children. Having an endowment of \$1,800,000, and a building and equipment valued at about \$500,000, it is exceptionally well fitted to perform such service in all its varied aspects. By contract with the city, the Dispensary has been conducting dental prophylaxis in the schools, for the support of which it has received annual appropriations that have been increasing from \$20,000 in 1916 to \$25,000 in 1925. Parents and children are taught the importance of measures for the prevention of dental defects by a regularly appointed lecturer, who visits each school at least once a year. In classrooms or assembly halls she gives the children illustrated talks on oral hygiene and related health subjects, and demonstrates the proper methods of cleansing the teeth. She also gives similar lectures and demonstrations to parent-teacher associations. This lecturer is not an officer of the School for Dental Hygienists (below). During 1924 there were 57,467 auditors at the lectures in the public schools. As the School of Medicine and Dentistry develops, a Dispensary library will be provided. The Dispensary contains a laboratory for research, but none is in progress at present (December, 1925); see "Research," above

Infirmary: a Children's Clinic only; an infirmary for adults has not yet been developed, but will be provided for clinical instruction in dentistry. Children's Clinic: two main rooms, and thirty-one accessory rooms; total floor area, 9200 sq. ft. Total number of chairs in active use, 37, including groups reserved for special purposes: orthodontia, 6; extraction, 2; examination, 1

Clinical service. Besides oral prophylaxis, operative dentistry, and orthodontia, the clinical service includes all phases of oral surgery. Since September 15, 1919, and up to November 15, 1925, there have been 10,065 operations for the removal of tonsils or adenoids, and about forty such operations are now being performed weekly. The nature and extent of the clinical service of the Dispensary during 1922-25, in the prophylactic aspects of which the student dental hygienists have an active share, is indicated by the data in the table on page 466

School for Dental Hygienists. The School for Dental Hygienists was established in 1916 for the purpose of training young women to perform prophylactic service in public schools, in hospitals and similar institutions for health service, and in the offices of dentists. The present academic requirement for admission is graduation from an accredited high school. The Director of the Dispensary is the Principal of the School, which has a Matron and ten additional teachers. The curriculum extends throughout

DENTAL SCHOOLS IN THE UNITED STATES

DATA PERTAINING TO THE CLINICAL WORK OF THE ROCHESTER DENTAL DISPENSARY: 1922-25

	Total number of cases treated	Total number of dental operations	Total number of teeth extracted	Total number of prophylactic treatments	Total number of tonsil or adenoid operations
1922	65,079	101,660	16,860	76,785	1,709
1923	67,530	108,978	18,451	93,157	1,686
1924	67,402	110,287	21,035	96,444	1,580
1925	68,105	115,954	20,126	104,805	1,682

one academic year, and consists chiefly of practical instruction in the Infirmary and in public schools, supplemented by lectures in anatomy and physiology, bacteriology, dental anatomy, dental pathology, elementary electricity, embryology, histology, hygiene and public health, materia medica, nutrition and dietetics, oral hygiene, practical nursing, preventive dentistry, prophylactic technique, rhinology, roentgenology, and sterilization

Groups of from six to fifteen licensed dental hygienists and students from the School, having portable equipments consisting of chair, cabinet, engine, instruments, sterilizer, and accessories, and operating under the supervision of licensed dentists, conduct the prophylactic work in the public schools and also in other local institutions. From September 15, 1916, to November 15, 1925, the number of treatments for school children was 684,283. This health service has induced striking improvement in the condition and appearance of the children, and the service is continued and supported by the city because of the obvious public advantages

Number of graduates (1917-25); 453; average per year, for nine years, 50

NUMBER OF GRADUATES: SCHOOL OF DENTAL HYGIENISTS, ROCHESTER DENTAL DISPENSARY: 1917-26

1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	Total
38	40	24	57	58	63	79	45	49	44 ¹	497

Disbursements (salaries, supplies, equipment, and cartage):

	1921	1922	1923	1924	1925
Total	\$6,882	\$8,679	\$9,156	\$6,770	\$7,167
Per graduate	119	138	116	150	146

Fees: matriculation, \$5; tuition, \$125; books, instruments, and uniforms additional. Total expense, exclusive of board and room, about \$175

Visited: October, 1921; June, 1922; May, 1924; December, 1925

The foregoing data (pertaining to the Dispensary) have been verified in detail by the Director

SUMMARY

THIS is the only institution ever designated formally a "school of medicine and dentistry," and no other has had so large a productive fund for the support of dental education and research. The School, which is based on a high academic foundation, should be able to provide the best in modern dental teaching. It aims to promote the principle that dentistry should be identical with medicine in the scope of its inception; can offer extraordinary opportunity to men and women of exceptional scholarly ability and tastes; and may become one of the most useful schools in its fruitage of teachers, investigators, public-health counselors, and private practitioners, of outstanding merit and capacity for leadership. No one competent to meet the admission requirements was inclined to enter the School when it was ready in the fall of 1925 to receive candidates for the D.D.S. degree. During the

¹The total present attendance (December, 1925).

first year of the curriculum, the required work for all students is restricted to anatomy, histology, biochemistry, and physiology. Neither the Faculty of the School at the present stage of its development, nor the Advisory Board, contains a teacher of a dental subject. The Director of the affiliated Rochester Dental Dispensary is one of the "officers of administration," and bears the title: "Dean of Clinical Dentistry."

The School, having a uniform minimum entrance requirement for all of its students, intends to give the dental candidates instruction exclusively in medical sciences during the first two years of a four-year curriculum, and to teach these sciences to medical and dental students together, without adapting any of the courses to the special clinical responsibilities and service of the prospective dental practitioners. Instead of creating medical and dental faculties simultaneously, it has been concluded that there will be no need for a "clinical dental faculty" until candidates for the dental degree are admitted to the third-year class, and that such a faculty can be selected during the two years after the admission of the first dental students, while they are engaged with the first-year and second-year medical students in the study of medical sciences. Before the School was opened, it was stated in an advertisement in the *Journal of the American Dental Association*, inviting prospective students to inquire for further information, that the School presented "unusual opportunities for school and hospital cooperation in medical and dental teaching." But prospective dental students who have had at least three years of work in an academic college will probably not seek their professional training where there are no experienced instructors to teach its practical aspects. There is very general recognition of the excellence of this School as a school of medicine, but there is also widespread disappointment over the fact that, although the School has been heavily endowed to advance both medicine and dentistry in the public interest, it has not accomplished anything important to promote dentistry, or dental science, or dental education. If this negative condition is due to a purpose to proceed very deliberately for the ultimate attainment of an exceptional outcome, one wonders, nevertheless, why it should be desirable to postpone indefinitely the public benefits that a more active policy might have enabled the School promptly to confer, in some degree at least, with those in the field of medicine.¹

It is regrettable that this School, having a very large endowment and being independent of income from fees, has made no provision for combined medical and dental curricula for the training especially of maxillofacial surgeons, oral surgeons, orthodontists, and physicians learned in the principles of stomatology—the phases of practice that most intimately embrace the joint responsibilities of medical and dental service (page 200). Neither medical nor dental schools have developed such curricula, which are becoming urgent from the standpoint of public need, and might be conducted by this School with the prospect of immediate usefulness in the most advanced phases of oral health-service. In fact, so great would be the influence of a school with Rochester's very abundant resources, if its efforts in dentistry were devoted generously to these important purposes, that it may be doubted whether the School's announced dental program is commensurate in prospective public value with the School's rare opportunity. By confining the instruction of the dental students during the last two years to the resources of the Dental Dispensary situated three miles from the University Hospital, in accordance with the published plan, the School may fail to promote, for both medical and dental students, effectual instruction in the correlations between clinical medicine and clinical dentistry. The School, despite the present clinical facilities of the affiliated Rochester Dental Dispensary, does not offer advanced courses for dental practitioners. The research that is about to be inaugurated will presumably be the initial phase of one of the most important aspects of the School's contribution to dental progress.

¹ The School's annual Announcements carry this introductory statement: "The foundation of this School was announced in 1920, as a result of large gifts by George Eastman of Rochester and by the General Education Board, for the purpose of establishing in the University of Rochester a school of medicine and dentistry of the highest order."

DATA RELATING TO THE DENTAL SCHOOLS IN THE STATE OF NEW YORK: 1919-26

Total attendance

	1919-20 ¹	1920-21 ²	1921-22 ³	1922-23	1923-24	1924-25	1925-26
Buffalo	176	216	178	181	183	128 ⁴	134
New York	500	793	720	689	640	560	578
College of Dental and Oral Surgery	531	665	552	601	...	...	...
Columbia (old) ⁵	4	7	13	20	...	...	...
Columbia (new) ⁶	...	...	...	...	532	379	303
Rochester ⁷	...	...	...	...	...	...	None
Total	1,211	1,681	1,463	1,491	1,355	1,067	1,015

*Proportion of students resident in the State of New York*⁷

Buffalo	99	98	98	98	98	96	96
New York	82	81	85	90	89	88	89
College of Dental and Oral Surgery	84	82	86	88	..	..	..
Columbia (old) ⁵	50	75	54	90	..	..	..
Columbia (new)	..	..	..	..	88	85	91

Number of graduates

Buffalo	15	56	38	65	54	42	51 ⁸
New York	67	138	109	220	260	90	107 ⁸
College of Dental and Oral Surgery	44	187	115	171	...	...	...
Columbia (old) ⁵	None	None	1	4	...	...	...
Columbia (new)	...	...	...	...	165	88	138 ⁸
Total	126	381	263	460	479	202	296

*Classification of the total attendance*⁷

	1922-23	1923-24	1924-25	1925-26	Total
Buffalo:	46	21 ³	50	64	181
	58	51	20 ³	54	183
	9 ⁴	47	46	26 ³	128
	27	7 ⁴	49	51	134
New York:	110	88 ³	266	225	689
	185	105	87 ³	263	640
	203	163	104	90 ³	560
	147 ⁹	167	157	107	578
College of Dental and Oral Surgery:	149	92 ³	188	172	601
Columbia (old): ⁵	8	5	3	4	20 ¹⁰
Columbia (new):	133 ⁶	142	78 ³	179	532
	35 ⁴	111	143	90 ³	379
	25	31 ⁴	109	138	303

¹ Included the last students on the three-year curriculum, which was superseded in 1917-18 by the present four-year curriculum.² The first year with four full classes as compared with three theretofore.³ The first group affected by the entrance requirement of *one* year of approved work in an accredited academic college.⁴ The first group affected by the entrance requirement of *two* years of approved work in an accredited academic college.⁵ The entrance requirement from the beginning (1916-23) was two years of approved work in an accredited academic college.⁶ The entrance requirement was one year of approved work in an accredited academic college for the consolidated schools in 1923-24; it has been two years since 1924-25.⁷ The Rochester School announced its readiness to receive first-year students in 1925-26; none qualified for admission.⁸ The number of seniors (December, 1925). ⁹ The attendance was limited to a maximum of 150.¹⁰ The maximum attendance was attained in 1922-23. See footnote 5.

gents, and which (b) empower the Regents to determine the conditions for the registration of individual schools. In the exercise of their discretion in the registration of dental schools, the Regents determine both the "preliminary requirement" and the "professional requirement" in education that applicants for admission to the license examination must meet. They register only the schools which, in their judgment, exact the stated requirements in pre-professional preparation, meet the specifications for the professional curriculum, and give satisfactory evidence of the consistent maintenance of these standards. The successive actions by which the Regents defined the chief requirements for the registration of dental schools and for the admission of graduates to license examinations in New York, having been widely influential, are indicated in the following summary, which has been prepared with the cordial cooperation of the Assistant Commissioner and Director of Professional Education (December, 1925).

SUCCESSIVE STEPS TAKEN BY THE REGENTS OF THE UNIVERSITY OF THE STATE OF NEW YORK FOR THE ADVANCEMENT OF DENTAL EDUCATION

I. *Preliminary education*

*Early requirements.*¹ The preliminary requirement prior to January 1, 1905, depended upon the date of a candidate's matriculation, as follows:

"Before January 1, 1896, no preliminary requirement.

"Between January 1, 1896, and January 1, 1897, a certificate of the successful completion of two years of work in a registered secondary school, or 24 counts in Regents examinations at a minimum standing of 75 per cent two years before the date of the award of the degree.

"Between January 1, 1897, and January 1, 1903, a certificate of the successful completion of three years of work in an approved secondary school, or 36 counts in Regents examinations at a minimum standing of 75 per cent, two years before the date of the award of the degree.

"Between January 1, 1903, and January 1, 1905, two years of work in an approved secondary school, or 24 counts before beginning the second annual course, and three years of such work, or 36 counts before beginning the third annual course counted toward the degree. The requirement of 1903 to 1905, while apparently a lowering of the standard, in reality was not, because the enforcement of the earlier requirement had been lax, but this requirement was strictly enforced.

Explanatory note on the significance of "counts." "Up to 1906 the equivalent in Regents examinations of one year of high-school study was 12 counts. In that year counts for all subjects were advanced 25 per cent and in June, 1906, 12 counts prior thereto became the equivalent of 15 counts. Therefore, a requirement of 24 counts in 1905 was identical with a requirement of 30 counts in 1906 and thereafter. In 1917, however, the number of counts per subject was not increased, but the number of counts in Regents examinations equivalent to a year of high-school study became 18 instead of 15. Consequently two years of high-school study were represented in Regents examinations, prior to 1906, by 24 counts; between 1906 and 1917, by 30 counts; from 1917 to date, by 36 counts.

"The term 'count' originated between 1888 and 1895. The academic year in both academy and high school at that time comprised three terms varying from 11 to 15 weeks, called fall, winter, and spring. Examinations were held in the closing weeks of each term. Three subjects a day for three days in the week constituted the normal curriculum in both the academy and the high school. It was assumed that this number of subjects was a fixed quantity and that eventually there would be four terms in the school year, which would naturally make two quarters for a semester. A pupil's attendance for one quarter was *counted* when apportioning the proceeds of the literature funds of the State to the academy and high school. Since Regents examinations were first established to provide an equitable standard for the distribution of funds entrusted to the Board, it was necessary to *count* in this manner to determine the proper distribution of the money. However, the quarters were not developed; and the examinations, instead of being held four times a year, were reduced by the

¹ In the statement of these requirements deviations from the official record in Regents Handbook 10 on Dentistry are corrections that have been made by the Director of Professional Education.

NEW YORK DENTAL CURRICULUM:1917-21¹*First year*

<i>Subjects</i>	<i>Recitation hours</i>	<i>Laboratory hours</i>	<i>Actual hours</i>
1. Anatomy	60	60	120
2. Chemistry, general	60	120	180
3. Dental anatomy, and operative technic	30	120	150
4. Histology	30	90	120
5. Physics, applied	30	...	30
6. Physiology	60	...	60
7. Prosthetic technic	30	310	340
Total	300	700	1,000

Second year

1. Anatomy (<i>continued</i>)	60	30	90
2. Bacteriology	30	30	60
3. Chemistry, organic and physiological	60	120	180
4. Dental histology	30	60	90
5. Metallurgy	30	30	60
6. Operative dentistry (technic; <i>continued</i>)	30	160	190
7. Physiology (<i>continued</i>), and hygiene	60	120	180
8. Prosthetic dentistry	30	120	150
Total	330	670	1,000

Third year

1. Bacteriology (<i>continued</i>)	30	30	60
2. Crown and bridge work	15	130	145
3. Operative dentistry, lectures and practice	45	195	240
4. Oral prophylaxis	15	90	105
5. Orthodontia	15	15	30
6. Pathology	60	30	90
7. Physical diagnosis and anesthesia	15	30	45
8. Prosthetic dentistry, lectures and practice (<i>continued</i>)	45	180	225
9. Radiography	10	20	30
10. Therapeutics and materia medica	30	...	30
Total	280	702	1,000

Fourth year

1. Dental ethics and jurisprudence	5	...	5
2. Dental history and economics	5	...	5
3. Dental pathology	60	30	90
4. Operative dentistry, lectures and practice (<i>continued</i>)	30	380	410
5. Oral hygiene and prophylaxis	5	30	35
6. Oral surgery	60	60	120
7. Orthodontia (<i>continued</i>)	15	60	75
8. Physical diagnosis and anesthesia (<i>continued</i>)	...	15	15
9. Prosthetic dentistry, lectures and practice (<i>continued</i>)	30	160	190
10. Surgical clinic	...	25	25
11. Therapeutics and materia medica (<i>continued</i>)	30	...	30
Total	240	760	1,000

¹The names of the subjects have been numbered and rearranged in alphabetical sequence in this and the related tables that follow.

omission of the March examination to two, in January and June. A subject pursued five days a week for a school year became a 5-count subject. Several years later a modification of this definition was made and *the count became what it is to-day, namely, the measure of a prepared academic subject recited each day a week for a school year.* For example, elementary algebra, a subject in which there are recitations five times a week, that is to say, every school day of the week throughout the school year, is a 5-count subject. . . . The 18-count allowance for a year of high-school study means as many as three prepared subjects every day throughout the school year and one prepared subject for three days a week throughout the year in addition to the other subjects in the high-school curriculum, which are generally classed as unprepared subjects. The 18-count allowance is assumed to cover a minimum school year.¹

"*January 1, 1905.*—The preliminary requirement was definitely established at four years of high-school study or the equivalent in Regents examinations. Any subjects in which Regents examinations were given could be used in making up the equivalent; at the same time a dental school was permitted to matriculate conditionally any student who was deficient in not more than one year of academic work, provided his name and the deficiency were filed with the University and the deficiency removed before the beginning of the second course counted toward the degree.

"*February 1, 1911.*—The equivalent in Regents examinations became 45 counts in designated subjects and 15 counts in electives. Among the specific subjects were two of the three sciences, physics, chemistry, and biology.

"*January 1, 1916.*—Conditional matriculation in a registered dental school was no longer permitted.

"*January 1, 1917.*—Instead of only two, all three of the sciences, physics, chemistry, and biology, were required, whether the certificate was based upon high-school study or Regents examinations. These three sciences were made a *sine qua non*.

"*January 1, 1921.*—A requirement of one year of college study, with no equivalent, became effective.² The rule was first enacted in 1919 and put in final form in January, 1920, to allow the dental schools sufficient time for adjustment. It called for the completion of a full-year course in physics in high school and the completion of a full year of study in an approved college of liberal arts and sciences, which year must include six semester hours each in English, chemistry, and biology, together with twelve semester hours of electives from the following group: a modern foreign language, mathematics, history, technical drawing, and shop practice.³

"*January 1, 1926.*—The requirement became two years of college study including six semester hours each in English, physics, chemistry, and biology, and electives sufficient to

¹The "Carnegie unit," which was developed by the College Entrance Examination Board and adopted by the Carnegie Foundation, represents one-fourth of a school year, and therefore is equivalent in general to four and one-half Regents counts. While finding the unit a convenient measure for the details of the work of a four-year high school, the Foundation has emphasized especially the general characteristics which may be expected in a good secondary education.

²Formally suggested by the Educational Committee of the Dental Faculties Association of American Universities, in January, 1917.

³In a circular letter dated June 26, 1925, which supplemented the details given above, the dental schools affected by the amended regulation were notified by the Assistant Commissioner and Director of Professional Education that the following Regents rule, on the "requirement for the registration of schools of dentistry," had been amended by the elimination of the numbers in brackets and by the insertion of the numerals in italics:

"The School must require, first, for admission after January 1, 1921, satisfactory evidence of the completion of one year of work in physics in an approved high school, and in addition one year of instruction in an approved college of liberal arts and science after the completion of an approved four-year high-school course based upon eight years of elementary preparation. The year of college instruction shall be not less than three year-hours (six semester-hours) each, of English, of biology, of chemistry, and six year-hours of electives from the following: a modern foreign language, mathematics, history, technical drawing, shop practice; and second, for admission after January 1, [1926] 1927, satisfactory evidence of the completion of two years of instruction in an approved college of liberal arts and science after the completion of an approved four-year high school based upon eight years of elementary preparation. The content of the course shall be a year of instruction, of not less than three year-hours (six semester-hours), each, of English, of biology, of chemistry, of physics, and electives sufficient to make up a full complement of work for the student during his two years of college study. Subsequent to January 1, 1927, at least three semester-hours of shop practice will be required."

make up a full complement of work.¹ In May, 1925, the Board of Regents advanced to *January 1, 1927*, the effective date for the two-year academic requirement, *as applied to dental schools other than New York that might seek registration* with the Regents; and the dental schools of the state were warned that at least three semester hours of shop practice would be added to the requirement after that date.²

II. Professional curriculum

"1917.— At the meeting of the Board of Regents, on March 1, 1917, there was presented a minimum four-year course of study for all dental schools seeking to be registered by the Board of Regents, which was recommended by the State Board of Dental Examiners, the State Dental Council, and the Assistant Commissioner for Higher Education. This course, approved by the Board of Regents to become operative at the opening of the session of the dental schools in the autumn of 1917, is shown in the table on page 471.

"1921.— At the meeting of the State Board of Dental Examiners, in New York City, May 12 and 13, 1921, it was voted that the four-year course of study for dental schools, approved by the Board of Regents in March, 1917, be amended in its first two years to read as shown in the accompanying table.

"The reasons for the changes in the curriculum were: *First*, with the advanced require-

FIRST AND SECOND YEARS OF THE NEW YORK DENTAL CURRICULUM: 1921-22³

First year

<i>Subjects</i> ⁴	<i>Recitation hours</i>	<i>Laboratory hours</i>	<i>Actual hours</i>
1. Anatomy (120+60) ⁵	90	90	180
2. Chemistry, organic (preliminary; also continued with physiological chemistry in the second year)	30	. . .	30
3. Dental anatomy and operative technic (120+30)	30	90	120
4. Histology (120+30)	60	90	150
5. Physiology (60+60)	60	60	120
6. Prosthetic technic (unchanged)	30	310	340
7. Metallurgy (transferred from the second year)	30	30	60
Total	330	670	1,000

Second year

1. Anatomy (90-60) — (<i>continued</i>)	30	. . .	30
2. Bacteriology (60+60)	60	60	120
3. Chemistry, organic and physiological (unchanged)	60	120	180
4. Dental histology (unchanged)	30	60	90
5. Operative dentistry (unchanged)	60	130	190
6. Oral hygiene (replaced metallurgy, which was transferred to the first year)	30	30	60
7. Physiology and hygiene (unchanged)	60	120	180
8. Prosthetic dentistry (unchanged)	30	120	150
Total	360	640	1,000

¹ First enforced by the Dental School of Columbia University, beginning in 1916-17. Recommended by the Dental Faculties Association of American Universities, in January, 1920. See the footnote on page 477.

² See footnote 3 on page 472.

³ This is the present curriculum for these two years except as indicated in the succeeding revision of the curriculum (1922) for the second year (page 474).

⁴ Compared with the preceding curriculum it will be noted that, for the first year, general chemistry (180 hours) and applied physics (30 hours) — a total of 210 hours — were eliminated from the curriculum. Metallurgy was transferred from the second to the first year, and oral hygiene substituted for it in the second year.

⁵ The first figure in parenthesis after the name of a subject indicates the corresponding earlier requirement; the second figure shows the number of hours added to that requirement or subtracted from it.

ment of one year of college work for admission to dental schools, a large number of hours required in the formerly approved dental course in chemistry and physics were no longer necessary and were gradually reduced or omitted entirely. Substitution therefor was made of more hours of study of strictly professional subjects. *Second*, the course has been made uniform for all the dental schools of the State in order to meet the criticism heretofore made that students who were obliged from force of circumstances not within their control to seek admission to dental schools other than those in which they first matriculated, found themselves conditioned in some subjects because the courses of study in the schools to which they were going and the schools which they were leaving were not identical year by year.

"1922.— At a meeting of the State Board of Dental Examiners, on October 19, 1922, it was formally voted that the number of hours devoted to the subject of physiology be changed from 300 for the course to 270; first year, 60 recitation and 60 laboratory, making 120 hours; second year, 60 recitation and 90 laboratory, making 150 hours; total, 270 hours. It was further voted that the word hygiene be omitted in the second-year course where it appeared with physiology, and that oral hygiene be changed to read "hygiene and sanitation," the course of study to remain the same — 30 recitation and 30 laboratory periods, making 60 hours for hygiene and sanitation — leaving oral hygiene (and prophylaxis) in the third and fourth years.

"The Regents, upon recommendation of the committee on higher education, voted that the changes recommended by the State Board of Dental Examiners be approved, and that the second year of the four-year course of study for dental schools be amended as shown in the accompanying table."

Handbook 10 on Dentistry, issued annually by the University of the State of New York, presents a copy of the dental statute, Regents rules, and additional information. On page 66 of the issue for June, 1925, under the head of "registration of dental schools," it is stated that "a school of dentistry may be registered as maintaining a proper educational standard and legally incorporated," provided it meets a number of specified conditions in addition to those mentioned above. The following pertinent statements are included in the explanatory comment:

"Dental Schools are registered by the Regents on formal application only, and a form will be mailed on application to the Assistant Commissioner and Director of Professional Education. The professional education requirement and the general preliminary education requirement of the institution must be considered by him fully equivalent to the requirements established by the statute.

PRESENT SECOND YEAR OF THE NEW YORK DENTAL CURRICULUM (SINCE 1922)¹

<i>Subjects</i>	<i>Recitation hours</i>	<i>Laboratory hours</i>	<i>Actual hours</i>
1. Anatomy (unchanged)	30	. . .	30
2. Bacteriology (unchanged)	60	60	120
3. Chemistry, organic and physiological (unchanged)	60	120	180
4. Dental histology (unchanged)	30	60	90
5. Hygiene and sanitation (change of title for oral hygiene — course and hours unchanged)	30	30	60
6. Operative dentistry (190 + 15)	60	145	205
7. Physiology (hygiene removed; 180 - 30) ²	60	90	150
8. Prosthetic dentistry (150 + 15)	30	135	165
Total	<u>360</u>	<u>640</u>	<u>1,000</u>

¹ The minutiae of the curriculum that registered schools must follow, on the new requirements now in force, have not yet been promulgated (March, 1926).

² The first figure in parenthesis after the name of a subject indicates the corresponding earlier requirement; the second figure shows the number of hours added to that requirement or subtracted from it.

"New York dental schools and New York dental students may not be discriminated against by the registration of any dental school out of the State on standards lower than those required in New York.

"Professional schools unable to meet the standards required by the Regents for registration in full shall be accredited by the University for one or more years of professional training as they meet the requirements for admission and for professional training required by the Regents standards.

"Professional schools registered by the Regents shall give the work of accredited institutions no higher recognition than that accorded such institutions in the Department's accredited list.

"The degree from a registered school only may be recognized for entering the licensing examination."

The lists of the North American dental schools, including indications of their status in New York and the equivalent values in years of the accredited institutions, are given on pages 70-78 of Regents Handbook 10 on Dentistry for 1925. There it will be found that the schools in the United States may be reassembled in the groups shown in the accompanying list, where the names are arranged in the alphabetic order of convenient abbreviations.

LIST OF AMERICAN DENTAL SCHOOLS AS REGISTERED OR ACCREDITED
BY THE STATE OF NEW YORK: 1925

Registered — 17

Buffalo (A) ¹	Iowa (A)	Ohio State (B)	Washington (A) ⁴
Columbia ²	Michigan (A)	Pennsylvania (A)	Western Reserve (A)
Harvard (A)	Minnesota (A)	Rochester ³	
Howard (B)	Nebraska (B)	Tennessee (A)	
Illinois (A)	New York ²	Tufts (A)	

Accredited (three years) — 19

California (A)	Louisville (A)	Meharry (B)	Temple (B)
Creighton (A)	Loyola, Chicago (A)	North Pacific (A)	Tulane (B)
Denver (B)	Loyola, New Orleans (B)	Northwestern (A)	Vanderbilt (A)
Georgetown (B)	Marquette (A)	Pittsburgh (A)	Virginia (A)
Indiana (B)	Maryland (B)	St. Louis (A)	

Accredited (two years) — 5

Atlanta (B)	Cincinnati University ²	Kansas City (B)	Southern California (A)
Cincinnati College (C)			

Not listed — 3

Baylor (A)	San Francisco "P. and S." (B)	Texas (C)
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¹ The letters in parenthesis indicate the Dental Educational Council's current ratings of the schools (1925). It has been impossible to find any justification for an assumption that the New York classification as a whole is so accurate or significant as that published by the Council.

² The rating has been postponed pending completion of the School's reorganization.

³ Registered, although the School has neither organized a dental faculty nor admitted dental students. The Dental Educational Council will not rate the School before the organization of a dental faculty and the completion of at least a semester of instruction.

⁴ For the year 1925-26, the Dental School of Washington University has lowered its minimum entrance requirement, including the basis for advanced standing in all classes, from one year of approved work in an accredited academic college to graduation from a high school, and therefore fails in this respect to meet the Regents standard for registration. See page 482.

A graduate of an accredited school can overcome his ineligibility for admission to the license examination in New York in only one way, namely, by gaining advanced standing in and graduating from a registered school, which, under penalty of forfeiture of its registration, may not give a student from an accredited school a higher degree of credit than that accorded by the Regents. Thus a graduate of a school that is accredited for only two years may not be given credit in advanced standing in a registered school for more than the first two years of the four-year curriculum.

The Assistant Commissioner and Director of Professional Education has publicly expressed the opinion¹ that three professional years on the two-three-graduate plan would be acceptable as equivalent to four professional years, if the three years were (a) based on two years of approved work in an accredited academic college, (b) lengthened to ten months (40 weeks) each, and also (c) given the content of instruction that may be specified by the Regents for the four professional years on the two-four plan, which has been operative since January 1, 1926, for New York schools and which will be effective after January 1, 1927, for all registered schools.² If this opinion should be made effective by the Regents, and if the factual equivalence of the undergraduate phases of both plans on this basis were thus officially recognized, it would seem to follow that a school on a three-year undergraduate curriculum could not be *registered* if any of the three years were less than 10 months (40 weeks) in length. All other conditions being adequate, however, such a school would be *accredited* for three-fourths of the full professional requirement; and its graduates, by taking an additional year in any registered school, would then be eligible for admission to the license examination in the State of New York.³

The Regents of the University of the State of New York, by raising the standard of preliminary education, by specifying minutiae of the professional curriculum, and by prescribing conditions for the registration of preferred dental schools, have obviously endeavored to elevate the practice of dentistry in New York to the highest attainable degree; and not only to protect the citizens against the consequences of inept practice, but also to restrict the licenses to practitioners of special ability. There is very general appreciation of this important service. But there is also dissatisfaction with certain anomalies of it. The executive procedures for the furtherance of these purposes have not always been measured by the success of the New York schools in meeting old regulations before being obliged to face higher requirements, nor by demonstrated ability of these schools to make the proposed advancements. Increases in quantitative standards have often apparently been regarded as assurances of automatic improvement in quality, and nominal observances of new requirements have sometimes been permitted to pass for enforcement. Thus, in 1921-22, when one year of approved work in an accredited academic college became a uniform entrance requirement, two of the New York schools, independent and having 1272 of the total of 1463 dental students then in the state, were among the poorest in the United States, and clearly incompetent as then organized and equipped to give the improved instruction that the new New York standard was intended to ensure. The official issuance of dental student certificates on entrance requirements in force before 1921, without limitation of their

¹ *Proceedings of the American Institute of Dental Teachers*, 1923, xxx, p. 115; *Proceedings of the American Association of Dental Schools*, 1925, ii, p. 119.

² The academic year could be lengthened to the greatest advantage in most instances, probably, by initiation of the work in a summer session ("quarter").

³ Copies of the manuscript of pages 468-476 and of a printer's proof of pages 468-485 were forwarded to the Director of Professional Education, who verified in detail, on the manuscript, all of the parts on pages 468-476 except this paragraph, on which he has omitted to comment (June, 1926).

validity to that period, favored acceptance of such certificates, at these overcrowded schools, after the new requirements went into effect, and thus facilitated approved acceptance of students who were otherwise ineligible for admission, but who nevertheless were permitted to continue. In the same year, some of the required subjects in the state's curriculum were given only casual attention. In one New York school the official specifications in laboratory hours for several medico-dental subjects, although included in the summary in the annual Announcement that professed conformity therewith, were openly ignored in the instruction. While the improved pre-professional training of most of the students made them more competent to teach themselves, and to that extent was an important gain, what these New York schools then needed above everything else for their improvement, as any observant visitor might have noted, was helpful guidance to higher scholastic quality, rather than the imposition of new burdens that they were unable to carry.¹ "Registration" of these schools, regardless of these conditions, did not make them equal to or better than various schools in other states which, although only "accredited," were far superior—it did not protect the citizens, but it shielded the schools.

As a consequence of the prevalence in New York of such anomalous conditions, which have been well known to dental teachers and dental examiners throughout the country, the state has long been notable for the relatively high standards of its formal educational requirements in dentistry (page 468), for the exceptionally low grade of accomplishment of some of its own dental schools (page 480), and for its dependence upon schools in other states for the quality of the training that the regulations of the Regents were intended to ensure in New York (page 468). The extreme deficiencies of the two independent schools in New York City, which the new regulations in 1921 had not materially improved, but which effectual advisory cooperation from the Department of Education might have removed, led the Dental Educational Council of America, in February, 1923, to specify to both schools the nature of their most serious weaknesses and to indicate privately to the faculties that the Council's previous Class B rating could not be continued after July 1 of that year, unless each school was completely reorganized and improved in accordance with the obvious responsibilities of an acceptable dental school. Public re-rating of both schools has been postponed by the Council since July 1, 1923, in order to give them ample opportunity to respond to these suggestions (February, 1926). This decisive action by the Council brought about the union of these independent schools with two important universities, and ensured their ultimate improvement in accordance with the ideals of the institutions of which they have become organic parts.

Through the direct intervention of the Dental Educational Council, independent dental schools have finally become extinct in the State of New York. Buffalo, Columbia, New York, and Rochester Universities, each having a dental school, are competent to promote dental education in this state in full accord with the requirements of modern oral health-service and in harmony with each university's public responsibility, and do not need to be regulated by narrow restrictions like those outlined on page 471, which prevent the types of desirable educational experimentation and development

¹ Before the entrance requirement of one year of approved work in an accredited academic college became operative in 1921, each of the independent dental schools in New York City published in its annual announcement for 1920-21 the following quotation "from the Regents rules": "A dental student certificate may be secured after January 1, 1926, upon the presentation of satisfactory evidence of the completion of two years of instruction in an approved college of liberal arts and science," etc. This rule was not included in the issue of Regents Handbook 10 on Dentistry for 1920, but has been published annually since 1921. It was first announced for the Buffalo School in 1921. The original Columbia School exacted the two-year requirement voluntarily from the beginning, in 1916.

that earnest and able teachers are inclined to attempt. These universities should not be directed, for example, to teach "physical diagnosis and anesthesia" together in the third year and also in the fourth year, nor be obliged to allot to this pair of subjects 15 recitation hours and 30 laboratory hours in the third year, and 15 laboratory hours in the fourth year.¹ There are good educational and professional reasons for teaching these subjects separately, under conditions unlike those specified in the annual Handbook, which in such matters may be not only unsoundly predicated but also out of date immediately after its publication. The era of proprietary, independent, and irresponsible conduct of dental schools having passed, the public welfare would assuredly be promoted by freedom in the universities from external restraints in matters of detail. The universities should have full opportunity, under the general supervision of the Regents, to conduct dental education in accordance with the most effectual procedures for its advancement as determined experimentally by competent and experienced teachers in the schools. A curriculum by edict that enforces in the third year an allotment of 15 recitation hours and 15 laboratory hours in orthodontia, for example, and of 15 recitation hours and 60 laboratory hours in the same subject in the fourth year, when most of this work should obviously be reserved for graduate study, suggests degrees of paternalism and of particularism that could be justified only by omniscience.

On page 474, in the statement prepared with the coöperation of the Director of Professional Education, appears the following explanation:

"The course [curriculum] has been made uniform for all the dental schools of the State in order to meet the criticism heretofore made that students who were obliged from force of circumstances not within their control to seek admission to dental schools other than those in which they first matriculated, found themselves conditioned in some subjects because the courses of study in the schools to which they were going and the schools which they were leaving were not identical year by year."

This plan, to enforce not merely a minimum requirement but also complete uniformity, tends to maintain undesirable rigidity of the curriculum, to efface the individuality of the schools, and to make it a matter of no importance which school a student attends. Rochester, with an entrance requirement of three years of approved work in an accredited academic college, presumably will have to adhere to the four-year curriculum prescribed for New York schools on a two-year requirement beginning in 1926-27. Plans like this for the enforcement of homogeneity not only disregard the principle of the greatest good for the greatest number, but also exaggerate the importance of the consequences they would avert, destroy initiative in the schools, carry into professional education the mechanical standardizations of groups of coördinated factories, and, by establishing a system of equivalent credits for identical courses in the same years, so that students may be automatically transferred from one school to another, have the very undesirable effect of tending to prevent the attainment in the best schools of anything higher than the plane of the prescribed minimum. Dental education will be improved most effectually by being liberated to undertake intelligent, reasonable, and continual experimentation with new plans and new procedures, not by being confined in bureaucratic straitjackets. Encouragement of dissimilarity among strong institutions that are free and able wisely to depart from petrified standards of uniformity would tend greatly to reduce the importance of certain types of machine regulation; but the attainment of wide diversity among good schools, by extension

¹ Although the state's curriculum is officially designated a "minimum course of study," it is expected that it will be followed in detail where special dispensations have not been granted. The official reason for the required uniformity in the curricula of the New York dental schools is stated on page 474 and also below, where it is discussed.

of the scope of their experiments, would raise the quality of dental education and quicken the rate of its progress.¹ Arbitrary impositions of restrictive details of technical procedures that tend to reduce the teacher to an automaton advance neither the profession of teaching nor the quality of instruction, in dentistry or in any other field.

An accurate measure of the *maximum* value of the New York plan to make the curriculum uniform in the dental schools of the state is the average number of students admitted to advanced standing in all of these schools per annum during a series of years. The available data reveal the fact that the plan has obviously been failing to do what it was intended to accomplish. Thus, for the seven years 1918-25, the total number of such students, including all of those admitted from schools in other states (who constituted a majority), but excluding the few students from foreign countries, was only eighty-seven, or an average for the schools collectively of only twelve students per annum in a total yearly attendance ranging between 1681 (1920-21) and 1067 (1924-25).² In 1924-25, when the total attendance at the New York schools was 1067, only four American students were admitted to advanced standing in all of the schools in the State of New York. The prescribed uniformity in the curricula, therefore, appeared to sacrifice the interests of 266 students in order to aid the convenience of only 1 student in every 267. These data on advanced standing are significant also in another relation: they indicate that dental students generally and their advisers throughout the United States do not regard the over-regulated New York schools as superior educational institutions. The dwindling total attendance at these schools since 1920-21 (page 469), and the increasing number of New Yorkers in attendance at schools in other states (page 468), seem to imply that this opinion is also shared widely among dentists in the State of New York.

Special attention has been drawn to the importance of the function exercised by the state boards of dental examiners and to the great need for more earnest attention to the selection of these public representatives of the profession (page 67). The more trustworthy and competent its board of examiners, the less need there is in any state for bureaucratic interference with the academic freedom of its dental schools. An able and responsible board protects the citizens against the consequences of ignorance or inefficiency by granting licenses only to those persons who, having graduated from good schools, are found by the examiners themselves to be worthy, reliable, and proficient. A graduate of a good school, who may be fully aware of his ethical responsibilities and also of his legal obligations and rights as a prospective practitioner, should not be debarred from a license examination because he did not pass a formal course of five recitation hours in "dental ethics and jurisprudence" in the last year of a four-year curriculum, which might have been more effectually taught informally, for example, as parts of an integrated course on the principles of the practice of dentistry. The public interest would certainly be promoted in New York by the removal of all needless limitations on the freedom of the universities to produce good dentists on the best programs their dental schools might devise, and by reliance upon a faithful board of competent examiners accurately to evaluate the product of such advanced education and to make abuse of liberty in the schools improbable or innocuous. Such important organizations as the National Association of Dental Examiners and the American Association of Dental Schools,

¹ The prevailing democratic pressure in the direction of mediocrity and conformity, and the general tendency to discourage innovations and dissimilarities, may safely be relied upon to prevent incautious variations or demoralizing adventures in dental education under the conditions of the proposed new freedom in New York.

² These figures for attendance indicate the total number of students at the end of the years.

which recurrently facilitate the comparison of methods, the discussion of experiences, and the promotion of the most useful developments, are protective agencies against abuses of freedom by the schools or of authority by the state boards. These associations also exert corrective advisory influences that recognize state rights, discourage state selfishness, and promote the public welfare from the national standpoint.

In the formal regulation of dental schools there is urgent need for a better and more general appreciation of the fact that the development of the individual student and his competency as a practitioner, rather than the details of courses or the records of credits, are the educational objectives of the state as well as of the school. A prescribed curriculum should be made a means for the mastery of subjects—for the attainment of ability in their integration and of proficiency in their use in oral health-service—not merely an agency to promote the routine passing of courses and to facilitate the acquisition of consequent credits as symbols of knowledge or as substitutes for it. The New York dental statute permits the Regents to conduct "partial" license examinations, of students who have completed the first two years of the curriculum, in some of the most important of the medico-dental sciences. Such examinations may be taken by dental students as early as the end of the second year—while these "preclinical" subjects as such are fresh in the mind of the student and before he is expected to forget nearly everything he learned about them. Instead of regarding these important sciences, from the standpoint of the requirements of oral health-service, as closely related components of a demonstrable capacity to begin a competent and dependable general practice, and to grow in proficiency, the provisions of the law permit the Regents to give to these subjects the character of preliminary hurdles to be jumped and credited as soon as possible, and then ignored in the concluding phase of the license examination, where evidence of the complete integration of all the sciences

DATA SHOWING THE PROPORTION OF FAILURES OF GRADUATES OF THE DENTAL SCHOOLS IN THE STATE OF NEW YORK IN THEIR FIRST ATTEMPTS TO PASS LICENSE EXAMINATIONS: 1919-25¹

<i>Schools</i>	1919	1920	1921	1922	1923	1924	1925	<i>Cumulative 1919-25</i>
Buffalo	18.4	16.7	10.9	5.5	23.1	15.1	4.1 ²	15.1
New York	31.6	27.9	27.0	43.3	29.2	29.0	12.9 ²	29.3
College of Dental and Oral Surgery	27.6	16.0	18.1	37.1	38.5	...	...	28.6
Columbia (old)	...	...	...	None	25.0	...	...	20.0
Columbia (new)	...	...	...	...	...	33.9 ³	17.9 ²	29.0
Rochester ⁴	...	...	...	...	...	...	...	...
Average for all of the schools in the United States	15.1	19.6	13.3	12.6	10.1	12.2	11.3	12.8
<i>Average for all of the schools in the United States outside of New York</i>	12.8	19.1	11.2	8.4	6.3	9.0	11.1	10.2

¹ These dismal results are much more significant than most data of this kind because they were obtained chiefly by one board, and are indicative in the main of the judgment of New York's own examiners. The data reveal the quality of some of the schools which, despite such suggestions as these of their inferiority, were officially registered in New York as acceptable. The data throw additional light on the success of the recent methods for the detailed regulation of dental schools in the State of New York.

² The first group affected by the entrance requirement of one year of approved work in an accredited academic college. The improvement in the results for 1925 as compared with 1924 is probably due in large degree to the greater ability of these students, having a higher average preliminary education, to teach themselves. This probability was mentioned on page 477, in the discussion of the need for betterment of the schools in New York City.

³ See footnote 2 on page 459.

⁴ Opened in 1925-26. As there were no students, the first class will not graduate before 1930, unless students should be admitted to advanced standing and graduated in less than four years.

in the dental curriculum should be clear and convincing.¹ Students, quickly discerning the import of such a superficial evaluation of subjects as units to be passed rather than assimilated and coordinated with others, tend to slight the "fundamental sciences" throughout the clinical years, during which the teachers, who in their day learned to "pass" these courses, often fail to apply and to integrate effectually the preclinical subjects with the clinical instruction and practice.

The New York Board of Dental Examiners has been endeavoring to protect the interests of the public, and with more freedom may be expected to gain rather than to lose strength in the performance of its important duty. These inferences appear to be supported by the percentage data, on page 480, relating to failures of the graduates of the schools in this state in their first attempts in recent years to pass license examinations, most of which were taken in New York.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the New York schools who failed, in the number of states indicated by the figures in parenthesis:²

1925.—Buffalo, 4.1 (1); Columbia, 17.9 (1); New York, 12.9 (1); U. S. schools collectively, 11.3.

1910-25 (cumulative).—Buffalo, 21.2 (7), New York, 28.0 (6); U. S. schools collectively, 14.2.

1924 and 1925 (cumulative).—Columbia, 29.0 (2); U. S. schools collectively, 11.8.

A plan to restrict practitioners in any state to graduates of good schools helps to protect the interests of its citizens, recognizes the fact that the individual practitioner is the primary agent in oral health-service, increases the probability that only able and responsible practitioners will apply for licenses and receive them, and tends both to elevate public respect generally for the better schools and to promote the ascendancy of their influence over that of inferior schools. In New York, a plan of this kind has included the annual publication of a list of registered or acceptable schools, and of accredited or unacceptable schools (given for 1925 on page 475), which unfortunately does not represent recurrent examinations of the schools nor the verification of all of the distinctions that are implicit in the register. The publicity attending this classification, which includes all but three of the dental schools in the United States, might be more reasonable if it emanated from a state that is not obliged to rely upon schools in other states for a steady influx of proficient practitioners, or where only good schools are allowed to exist, or where the local unacceptable schools are officially rated as such. But the recent registration of very poor New York schools as acceptable, and the formal degradation of better schools elsewhere as unacceptable, has tended to give to the New York classification a highly fictitious quality. As compiled for 1925, this register fails to distinguish important educational differences, does not express or afford a reliable basis for judicial estimates of educational or professional values, and would be more suitable for provisional use privately than for purposes of proclamation.

Many of the obvious inferences from this superficial classification are remarkable. Sympathetic allusion has been made in various portions of this Bulletin to the need for great improvement of the schools for colored students at Howard and Meharry, which are seriously handicapped by their present disabilities; yet the school at Howard is registered and is accounted equal in standing to those in such universities as

¹ This situation encourages the New York schools to protect their "state-board record" by requiring candidates for advanced standing in the third or fourth year to pass partial license examinations before admission.

² Most of the graduates were examined by the New York Board, who noted a large majority of the failures.

Michigan and Minnesota, which also enforce the New York entrance requirement. It is graded superior to such schools as those of Louisville, Northwestern, Vanderbilt, and Virginia, each of which—a Class A school—is accredited for only three years, although it exacts the New York entrance requirement. The Class B school at Meharry, which enforces the New York requirement for admission and is equal in quality to the school at Howard, is rated inferior to this school but equal, for example, to the Class A schools at Louisville, Northwestern, Vanderbilt, and Virginia. These schools, in turn, are evaluated as only three-fourths as competent as the Class C New York College of Dentistry, which is now being completely reorganized as a part of New York University; and the Class C Cincinnati College is one-half as good as the best. If, using additional examples, a graduate in 1923 of the Class A school in Los Angeles, which is accredited for only two years, had successfully repeated in 1923-24 the junior year in the Class B school at Denver, and in 1924-25 the senior year in the Class B school in the University of Nebraska, he would have been eligible in 1925 for admission to the license examination in New York. But if in 1923, instead of graduating from the Class A school in Los Angeles, he had graduated from the Class C College of Dental and Oral Surgery of New York, which has lately been reorganized as a part of Columbia, he would have been eligible for admission two years earlier (page 460). The Class A school at Baylor is neither registered nor accredited, presumably because it has not applied for recognition; therefore, regardless of the real standing of the school, a Baylor graduate could not be admitted to a license examination in New York, however worthy he might be, before he graduated also from a registered school, which might be one of Class B grade. When classifications of this kind are not founded upon accurate information that is kept constantly revised, through direct observation, they are apt not only to promote false and unjust impressions, but also to present such inaccuracies as the continuance in the acceptable group, on the New York list for 1925, of the school at Washington University after its entrance requirement had been dropped below that stated by the Regents to be a prerequisite for registration.

With the exception of the dental school in Washington University, all of the registered schools in the New York classification for 1925 (page 475) enforced an entrance requirement of at least one year of approved work in an accredited academic college—the present official minimum in New York—whereas graduation from a high school sufficed before 1925-26 for admission to all but seven of the twenty-four schools on the accredited list. This general difference in the amount of *pre-professional* education of the students at these two groups of schools is expressed in the classification in terms of years of the *professional* curriculum, nineteen of the twenty-four accredited schools being rated individually as equivalent to three-fourths of the value of a registered school; that is to say, the graduates of these nineteen unacceptable schools may receive credit for the first three of the four professional years in an acceptable school, and may gain admittance to the license examinations in the State of New York by successfully repeating the fourth year in any registered school. Several peculiarities of this system account for the criticism, now generally current, to the effect that the plan lacks educational sincerity, and fails to distinguish among the schools and the graduates the differences which its publication and enforcement presume to establish. The salient features of the plan are these:

- (1) The present New York standard in preliminary education stipulates that the candidate for admission must have passed certain kinds of courses during at least one

year of attendance at an academic college,¹ but does not require the Regents or a dental school to ascertain that at the time of his matriculation the student has in fact adequate knowledge of the required subjects or any ability to use them in the study of dentistry. A validated certificate showing a tabulation of the required course credits suffices.

(2) Notwithstanding the indifference to the student's actual as distinct from presumptive intellectual status at the time of his admission to a dental school on the New York minimum, the Regents designate as unacceptable a school that does not demand the certificated full equivalent of the New York requirement in professional credits, thus giving to this implied preliminary preparation the quality of a formal prerequisite.²

(3) Having thus accorded to the stated entrance requirement in pre-professional education the character of a *sine qua non*, the Regents frankly ignore it as such, and, for the individual student five years later, accept as a substitute a repetition of the fourth professional year consisting of relatively little that the student has not previously covered in his fourth year in the unacceptable school and giving no instruction in any of the missing *pre-professional* prerequisites. The qualitative deficiency in what the Regents denominate essential preparatory education, in distinguishing mathematically between registered and unacceptable schools, is covered by quantitative superfluity in fourth-year professional courses. The deficiency in preparatory education of a graduate of an unacceptable school, in physics let us say, may be made up in a registered school by his renewal of the usual experience in fourth-year therapeutics and *materia medica*, by again following the outlines of dental history and reviewing the principles of dental economics, by listening to new lectures on the import of dental ethics and of dental jurisprudence, and by other advanced repetitions in the clinics and lecture rooms. The penalized student, if highly proficient in any of these subjects and able to demonstrate it, may not improve this situation by substituting more advanced work in any relation—he must adhere to the regular schedule for the undergraduate fourth year.

This plan is anomalous in the manner in which it coordinates these three factors:

(1) Emphasis on the educational value of sharply specified pre-professional course credits which need not represent actual knowledge or ability at the time the student is admitted to the dental school;³

(2) Insistence that this minimum requirement of pre-professional course credits, despite the indifference to their actual significance (1), be exacted by a school as one of the conditions for its registration in New York;⁴ and

¹ The Regents have announced that this standard will be changed to two years for the schools in New York State beginning in 1926-27, and for all other registered schools beginning in 1927-28 (page 472).

² The exceptional status of the Dental School of Washington University was noted on page 482.

³ Technical standards like those of factor 1 are obviously useful for general evaluations, if their arbitrary character and mechanical nature are clearly recognized, and provided that the estimations based upon them are made with a degree of elasticity which facilitates the attainment of essential equity through the exercise of common sense and sound judgment. "The standards are made for the students, not the students for the standards." Dental Schools are now conducted for the effectual training of educated men and women for the practice of dentistry in the interest of the public. This attainment is plainly paramount to the question whether the desirable preparatory education, which may be derived in more than one satisfactory way, was obtained in exact accord with the minutiae of hard and fast prescriptions of subjects, courses, hours of study, and other conditions that are open to nominal observance, narrow technical interpretation, or inaccurate measurement. If an academic education were a commodity that could be wrapped up in a package and handed to a purchaser, factor 1 might be evaluated gravimetrically.

⁴ Factor 2 would be more useful if it aimed merely to distinguish in a general and practical way between good schools and inferior schools, instead of applying the present artificial standards to the schools in the State of New York and seeking to impress them upon the remaining states and the whole world. The *Proceedings of the American Association of Dental Schools* (1925, ii, p. 114) record, in this statement by the Director of Professional Education.

(3) Frank disregard for the stated importance of basic conditions (1) and (2), respectively, by the ultimate acceptance of a calendar substitute, in terms of repetitions of professional courses, for the missing prerequisites in preparatory education.¹

On this plan a graduate of an unacceptable school, having failed to meet basic conditions (1) and (2) in academic education, may attain good standing on the official record, not by obtaining at an academic college something essential that was lacking from the beginning of his professional study, but by substituting professional redundancy for it. Although a graduate of an unacceptable school who under such conditions repeats the fourth year in a registered school has not removed the educational handicap which the Regents requirement in New York is presumably intended to prevent, nevertheless he has been heavily fined in tuition fees and in wasted time for not graduating from a registered school to begin with—in 1923 from either of the independent Class C schools in New York City, for example. Payment of this penalty makes him eligible for admission to the license examinations in New York despite the continuance of the proscribed educational deficiency. He has passed an adequate number of courses, and the total of his credits on the adding machine is ample—and, besides, all of the inferior schools in the Empire State have been protected. So far as the next license examination in New York is concerned, the most exceptional graduate of the Class A dental school at Northwestern University, for example, could not be admitted, but the least proficient graduate of the Class B dental school at the University of Nebraska would be eligible.

As a shield for inferior schools in the State of New York, this plan has been a success.² Its favoritism encouraged such schools to continue, and it strengthened them financially. Fortunately, the intervention of the Dental Educational Council has caused these schools to disappear, and the university schools in the state neither need nor deserve any protection other than that afforded by their own merit. If any other state were to set up a bureaucratic censorship that would automatically include the annual proclamation that all of the dental schools in that state, however inferior they might be, are among the best, and would use the strength of the state aggressively to try to force in other states developments in dental education, in conformity with its own prejudgments, which information and persuasion could not bring about, New York would be among the first to resist its pretensions.

It may be doubted whether, in any state, any public officials are better qualified to determine who should be admitted to a dental license examination, and who should

the arbitrary manner in which the New York standards have been set: "When we began to revise the medical course in New York and the Association of American Medical Colleges announced a curriculum of 5200 hours, our board and deans were called together and told to cut that 5200 hours to 3600, which should be the *absolute minimum*, in their judgment as professional men, [that] a man ought to know [sic] to practise medicine. *They cut it.*" (The italic does not appear in the original.)

¹ Factor 3 not only minimizes the importance of factors 1 and 2, but also raises the question whether they have much more than a nuisance value as at present administered. (See footnote 4 on page 483.) The punitive effect of factor 3 would be reduced, and an educational value imparted, if graduates of accredited schools who are required to take a year in a registered school were permitted to do advanced work instead of being obliged to mark time in undergraduate repetitions.

² In the rule quoted on page 475, it is said that "New York dental schools and New York dental students may not be discriminated against by registration of any dental school out of the State on standards lower than those required in New York." This purpose is good as far as it goes, but it puts the interests of the schools and of the students above the welfare of the New York public, in whose behalf such an assurance as that which follows might suitably have been substituted: "The Regents will not register inferior New York schools, but will inform the public that such schools are educationally and professionally unacceptable; and will not permit New York schools thus publicly rated as unacceptable, and the students who show their moral quality by preferring them, to have, in respect of admissibility of the graduates to the license examinations, a standing equal to those of better schools in other states, many of whose graduates would be more acceptable practitioners in New York. The Regents will scrupulously avoid any justification of a charge that inferior local schools are approved because of political pressure at the expense of good schools that are too remote to exert such pressure."

be granted the license, than an able and conscientious board of dental examiners who, fully representative of the best in the profession and free to cooperate judicially with the local dental faculties, would have ready access to the work and examinations of each school in the state. If the Regents and the dental profession paid more attention to the development of this important phase of the regulation of dental education in New York, and gave less to details affecting indistinguishable mathematical differences among dental schools in other states, New York would probably gain far more from its official supervision than it does; and intrusion into the affairs of other states, which is particularly unbecoming to the most populous state, might thereby also be entirely avoided.

It is but a truism of good citizenship to say that laws, while they remain on the statute books, should be obeyed. Yet no provision of an act of the people's representatives can be accorded a sanctity that is above the reach of a citizen's criticism of any of its apparent failures to promote the public weal. The New York Legislature has been responsive through the years to the suggestions and requests of the Regents for statutory enactments intended to advance the practice of dentistry and to improve the training of dental practitioners. It is reasonable to assume, therefore, that further proposals by the Regents of amendments to the dental practice act, which might make its provisions more serviceable to the public, would invariably receive the faithful attention of the Legislature. The dental rules that have been enacted by the Regents prescribe the limitations for the exercise of the discretionary powers of themselves and their subordinates under the dental statutes, which are not inflexible but in many situations afford opportunity for executive differentiation on the formulated standards of the law. Among these rules are those that determine the extent of preliminary education above graduation from a four-year high school or the equivalent for admission to registered schools, the publicity relating to the classification of the schools, the conduct of partial license examinations, the minutiae of the curriculum, and the measures to make the curricula of the New York schools uniform. All such rules are expressive of the judgment and will of the Regents, and are open to betterment without legislative action whenever, in the opinion of the Regents, revision is desirable or necessary to meet new conditions, or to end abuses or misjudgments arising from the opportunities for discrimination under the statute.

NORTH CAROLINA

Population: 2,740,841. Number of dentists, 810; physicians, 2281. Ratios: dentists to population, 1:3384; physicians to population, 1:1202; dentists to physicians, 1:2.8

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a four-year high school or the equivalent; after June, 1928, one year of approved work in an accredited academic college. Professional training: graduation from a Class A or Class B dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school

Dental school: none;¹ medical schools (2): University of North Carolina, and Wake Forest College (each gives only the first two years of a four-year curriculum)

¹See the comment on page 316 regarding the need for a dental school at Duke University, in Durham, North Carolina.

NORTH DAKOTA

Population: 682,828. Number of dentists, 289; physicians, 485. Ratios: dentists to population, 1:2363; physicians to population, 1:1408; dentists to physicians, 1:1.7

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a high school. Professional training: graduation from an accredited dental school. *Medicine*.—Preliminary education: sufficient for admission to the third year of the academic college of the University of North Dakota. Professional training: graduation from a Class A or Class B medical school; in addition, one year of service as an interne in an approved hospital

Dental school: none; medical school: University of North Dakota (gives only the first two years of a four-year curriculum)

OHIO

Population: 6,270,435. Number of dentists, 3295; physicians, 8113. Ratios: dentists to population, 1:1903; physicians to population, 1:773; dentists to physicians, 1:2.5

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a first-grade high school or the equivalent. Professional training: graduation from a reputable, legally chartered, dental school as defined by the Board. *Medicine*.—Preliminary education: graduation from a four-year high school or the equivalent. Professional training: graduation from a legally chartered medical school in good standing at the time the diploma was issued

Location of the dental schools (4): Cincinnati (2), Cleveland, and Columbus; medical schools (4): Cincinnati (2), Cleveland, and Columbus

CINCINNATI

Population: 408,559. Number of dentists, 369; physicians, 901. Ratios: dentists to population, 1:1107; physicians to population, 1:453; dentists to physicians, 1:2.4

Number of dental clinics or infirmaries, 12; hospitals, sanatoriums, and charitable institutions, 44; hospitals approved for internships, 5

Dental Schools: (1) Ohio College of Dental Surgery; (2) Cincinnati College of Dental Surgery. *Medical Schools* (2): University of Cincinnati, Eclectic Medical College

(1) OHIO COLLEGE OF DENTAL SURGERY; AFFILIATED WITH THE UNIVERSITY OF CINCINNATI. (See the Appendix)

Location: Seventh and Mound Streets; eight blocks from the centre of the city

General character: affiliated with the University of Cincinnati, since July 1, 1923; prospective absorption into the University now under consideration, the owner having expressed a desire to present the College as a gift to the University

Organized: in 1845; now "the oldest dental school in the world." A previous period of affiliation between the College and the University was maintained from 1888 to 1907

Building: erected in 1848; special improvements were made in 1908; total floor area,

18,750 sq. ft. Distance from the main site of the University of Cincinnati, two miles; and from the buildings of the School of Medicine, two and one-fourth miles

Infirmary: in the dental building, with four accessory rooms; total floor area, 3480 sq. ft. Total number of chairs in active use, 67, including groups reserved for special purposes: crown and bridge work, and prosthodontia, 6 each; extraction, 3; oral surgery, 2

Relation of the School of Medicine (Class A): some of the medico-dental instruction is given to dental students in separate classes, in the laboratories of the Medical School; and some of the medical teachers give instruction to dental students in the dental building. In 1924-25, one teacher of a medical subject gave dental students instruction in clinical medicine; one teacher of a dental subject gave medical students instruction in clinical dentistry. Now (1925-26) all of the medico-dental subjects are being taught to dental students in separate classes, in the medical laboratories, by members of the Medical Faculty

Dispensaries and Hospitals in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: Cincinnati General Hospital (two and one-fourth miles); Jewish Hospital and Dispensary (two miles); Episcopal Children's Hospital (one mile); Dental Clinics of the Cincinnati Public Schools (all parts of the city). The School gives free service to patients sent to its Infirmery from the Children's Home—Parent House (six blocks), and Madisonville Branch (five miles); Cincinnati Orphan Asylum (one and one-fourth miles)—service given for more than thirty years; Home of the Friendless (five blocks); Hope Mission, Madisonville (five miles); Mother's Methodist Memorial Social Centre (one block); and St. Paul's Parish House of St. Paul's Cathedral (four blocks). The Dean of the School is a member of the medical staff of most of these institutions

Clinical facilities in the Dispensaries and Hospitals where dental students received instruction in 1924-25: in the Hospitals, fully equipped dental infirmaries are maintained; also in most of the other institutions. In some, dental chairs and equipment have been donated by the College, which gives the dental service free of all charges—and the dental supplies also, whenever the College is requested to do so. Supervision of all operations (with records) is provided by the staff of either the College or the associated institution

Number of dental internships (0) and externships (6), held by students of the School, in the Hospitals in 1924-25: six. All of the members of the junior class perform accredited clinical service in public school clinics, under the supervision of a representative of the College

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building in 1924-25: the externships are among the School's agencies to meet and teach the dentist's obligation to promote the public health. The graduate internships at the General Hospital are rewards for merit. The students' service in the Public School Clinics is the Dental School's response to a request for help to maintain an established dental service that would lapse, otherwise, for lack of available public funds

Library (in the dental building): room, 480 sq. ft.; whole-time librarian. Contains 3500 bound and 2000 unbound volumes, and 1000 pamphlets (all effectively card indexed). Of the volumes, approximately 2000 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Libraries of the Medical School and University Hospital; Library of the Natural History Society (fourteen blocks)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: half-time officer; also Professor of Dental Pathology and Principles of Operative

Dentistry. *Vice-Dean*; whole-time officer; also Professor of Physics, Drawing, and English; and Registrar

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1924)

Next prospective advance in the minimum academic requirement for admission: uncertain

Number of graduates (1846-1925): 2497; average per year, for eighty years, 31

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 142; proportion from Ohio: 1922-23—52 per cent; 1923-24—55 per cent; 1924-25—57 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—2100; 1921-22—2800; 1922-23—4000; 1923-24—6700; 1924-25—7140 (the figures are estimates)

Number of visits: 1920-21—7350; 1921-22—11,200; 1922-23—14,000; 1923-24—26,800; 1924-25—35,700 (the figures are estimates)

Number of patients treated in the Dispensaries and Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-21—500; 1921-22—600; 1922-23—1200; 1923-24—1300; 1924-25—1600 (the figures are estimates)

Rated Class B by the Dental Educational Council of America (1918); new rating postponed since July 1, 1923, pending conclusion of negotiations involving prospective organic union with the University of Cincinnati

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$50,000, and equipment, \$86,075; total, \$136,075 (September 30, 1925). All of the property is owned by the chief stockholder

General debt on the School (September 30, 1925): none

Par value of outstanding shares (90) of stock (September 30, 1925): \$9000 (does not bear interest)

Accumulated net assets (September 30, 1925): \$168,497

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income</i> : ¹				
Fees (all kinds) paid by the students	\$25,952	\$34,500	\$45,100	\$45,800
Fees paid by patients, in all clinical departments	10,164	12,276	17,712	20,038
From the University of Cincinnati	...	...	...	None
Miscellaneous receipts	1,034	4,846	3,835	3,500
Total amount of current income	\$37,150	\$51,622	\$66,647	\$69,338
<i>Total amount of current expenditures</i>	\$38,797	\$42,215	\$54,378	\$58,845
Net income for the year	...	9,407	12,269	10,493
Deficit	1,647	...	...	...
Surplus paid to trustees, owners or stockholders	None	None	None	None
Amount of accumulated surplus	2,103	3,796	23,186	36,504
Average amount expended by the School per student (D.D.S.) per year	303	248	279	302
Average amount of all student fees paid to the School per student (D.D.S.) per year	203	203	231	235

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on June 30				
<i>Details of expenditures:</i> ¹				
For rent	\$4,200	\$4,200	\$4,200	\$5,700
For repairs	653	481	725	700
For new equipment	801	1,994	1,500	2,500
For research	150	150	175	175
For improvement of the library	211	513	525	500
For supplies used in the clinical departments	3,178	2,076	5,032	5,414
For salaries: for administration	5,424	5,423	11,138	12,800
For salaries: for teaching	13,594	15,542	18,900	27,000 ²
For all other purposes	10,586	11,836	12,183	4,056
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(10)	(10)	(13)	(12)
Amount of their salaries as teachers	7,258	8,066	11,400	16,200
Number of teachers of dental subjects who did not receive salaries	(5)	(6)	(5)	(7)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	1,725	2,325	2,400	2,400 ³
Smallest salary paid to a whole-time teacher of a dental subject	1,700	1,728	1,500	1,600
(Number of teachers of academic or medico-dental subjects)	(4)	(5)	(5)	(10)
Amount of their salaries as teachers	6,336	7,476	7,500	10,800 ³
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	1,600	1,600	1,600	2,000 ³
In the Medical School	...	...	...	6,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,600	1,600	1,600	1,600

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 29. Of this total number, 1 was a whole-time, 7 were half-time, and 4 part-time or occasional teachers of academic or medico-dental subjects; 6 were whole-time, 2 half-time, and 9 part-time or occasional teachers of dental subjects; 6 were whole-time teachers in the Dental School only; 15 were "full" professors; 3 were associate or clinical professors; 7 were lecturers by title; 7 received no salaries; 13 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Summer courses in clinical dentistry (June and July, and September): "spring and fall," since 1846; attendance: 1922—spring, 30; fall, 27; 1923—spring, 22; fall, 35; 1924—spring, 29; fall, 23; 1925—spring, 21; fall, 30

No combined curricula leading to the degrees of B.S. or B.A. and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

¹ During the academic years 1920-24, there was no payment on account of debt, new construction, or land.

² Of this amount, \$5000 was paid to the University of Cincinnati for the service of teachers of medico-dental subjects. For 1924-25, this amount was \$6500; it is the same for 1925-26.

³ For 1924-25, the largest such salary was \$3000.

DENTAL SCHOOLS IN THE UNITED STATES

STUDENTS AND GRADUATES: OHIO COLLEGE OF DENTAL SURGERY
DENTAL DEPARTMENT, UNIVERSITY OF CINCINNATI

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	113	104	130	172	200	201
Women.....	4	7	6	6	7	4
From other countries; chiefly from Latin America	8	5	3	1	1	3
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	98	97	128	170	195	195
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	3	3	13	14	3	4
From other countries, to advanced standing.....	1	0	0	0	0	1
"Repeaters" of one or more subjects.....	0	2	7	6	4	3
Denied further instruction because of deficient scholarship.....	0	1	1	1	2	1
GRADUATES (D.D.S.)						
Total number of graduates.....	58	18	13	19	56	41
Women.....	1	1	1	0	4	1
Admitted to practice in other countries.....	5	3	1	0	0	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	5	5	4	4	6	4
Percentages of failures in such state-board examinations.....	24.0	38.5	8.3	16.6	13.5	10.5

Research: actively in progress in 1924-25, on resorption of alveolar ridge from plate pressure, and of crests of sockets from gingival infection; use of zinc chloride and magnesium sulfate in the "ionization" of infected alveolar tissue; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: February, 1922; June, 1923

The foregoing data have been verified in detail by the Dean

SUMMARY

THE Ohio College of Dental Surgery was the pioneer in dental education west of the Allegheny Mountains, and in 1865 was the first to include a woman among its graduates. Despite its age and experience, the College, as a proprietary school, has been unable to meet modern standards of acceptability. The marked decrease in attendance since the School began in 1924 to require one year of approved work in an accredited academic college for admission, together with the insistence of the University on better teaching, has brought the School face to face with the need for endowment or for the equivalent. In 1922-23, eighteen teachers received salaries amounting to \$18,900, and the profit was \$12,269; in 1924-25, twenty-nine teachers received \$32,938, and the deficit was \$4082. The School is generous in its dental service for a relatively large number of dispensaries and hospitals, but under present conditions the experience the students thus derive is not particularly helpful to them in learning to correlate clinical dentistry with clinical medicine. The School's educational program has been restricted to the undergraduate curriculum, and research has received only perfunctory attention.

The University desires to proceed with the absorption and development of the School in close coordination with the Medical School, but lacks the necessary resources. The owner of the School has indicated a willingness to present the property to the University, but additional funds will be required for a new building and its equipment near the Medical

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF
CINCINNATI: 1924-25

<i>States (15) and foreign countries (4)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Kentucky	0	2	4	6	12
Ohio	6	33	32	22	93
Pennsylvania	0	1	1	3	5
West Virginia	0	14	8	12	34
China, Illinois, India, Japan, Kansas, Maine, Massachusetts, Mexico, New Jersey, New York, Texas, Virginia—one each	2	5	1	4	12
Indiana, Michigan, Vermont—two or three each	0	4	1	3	8
Total	8	59	47	50	164

School and Hospital. Since 1923, the Dental Educational Council, in anticipation of an early prospective regeneration of this College as an integral part of the University, has withheld a reclassification. The restraint of the Council in the interest of ultimate improvement deserves commendation, but unless the friends of the College soon determine definitely to help the University to convert it into a good dental school, the Council will be unable to justify further postponement of a public rating.

The University of Cincinnati is one of the few universities in which undergraduate medical students are given an opportunity to obtain instruction in dentistry. The Medical School has a Department of Dentistry, the head of which is a dentist who has the coöperation of two dentists as assistants in dental surgery. An elective course in oral surgery (one hour weekly), which is open to seniors, "takes up surgical conditions of the mouth and jaws of *mutual interest to the surgeon and the dentist*" (italic not in the original). All of the members of this Department of Dentistry are named in the register of the Medical Faculty, both assistants are included in the staff of the Department of Surgery, and one of the assistants is also Professor of Oral Surgery, Anesthesia, and Exodontia in the Ohio College of Dental Surgery. There are two dental internes in the University Hospital (Cincinnati General Hospital). If the University of Cincinnati finds it impossible to make the Ohio College of Dental Surgery an integral part of the University, the Department of Dentistry in the School of Medicine might be developed into a very effectual agency for the important purpose of teaching medical students to understand, and to practise proficiently, those phases of oral health-service that should concern both the physician and the dentist.

A large percentage of the dental students reside in states other than Ohio, chiefly in West Virginia and Kentucky, although both the number and the proportion of non-resident students in recent years has been decreasing. The geographical distribution of the students, in 1924-25, is indicated in the accompanying table, where the steady decline in the number of Kentuckians and Pennsylvanians, and the absence of West Virginians from the first-year class, are the most significant features. Comparative data relating to students, graduates, and results of license examinations, are given on pages 506 and 507.

(2) CINCINNATI COLLEGE OF DENTAL SURGERY

Location: 231 West Court Street; in the centre of the city

General character: independent and proprietary

Organized: in 1893. From 1902 to 1915, this School was the affiliated Dental Department of Ohio University (Athens)

Building: erected in 1897; total floor area, 8400 sq. ft.

Infirmary: with three accessory rooms; total floor area, 1600 sq. ft. Total number of chairs in active use, 21, including groups reserved for special purposes: prosthodontia, 3; extraction, 2; roentgenography, 1

School of Medicine: associated with none

Dispensary or Hospital in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: none

Library: in the Dean's office (open to students): room, 600 sq. ft.; no librarian. Contains 600 bound and 500 unbound volumes, and 500 pamphlets (not card indexed). Of the volumes, practically all relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Public Library (six blocks)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: whole-time officer; also Professor of Operative Dentistry and Oral Hygiene. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: Secretary and Registrar; whole-time officer

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1922)

Next prospective advance in the minimum academic requirement for admission: uncertain

Number of graduates (1894-1925): 440; average per year, for thirty-two years, 14

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 34; proportion from Ohio: 1922-23—80 per cent; 1923-24—80 per cent; 1924-25—85 per cent¹

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—8000; 1921-22—7500; 1922-23—8000; 1923-24—9000; 1924-25—8500 (the figures are estimates)

Number of visits, sittings, or operations: 1920-25—no available data

Rated Class C by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class C

FINANCIAL DATA

Estimated value of land and building, \$35,000, and equipment, \$20,000; total, \$55,000 (December 31, 1924)

General debt on the School (December 31, 1924): none

Par value of outstanding share (1) of stock (December 31, 1924): \$100

Accumulated net assets (December 31, 1924): \$55,421

	(1) 1921	(2) 1922	(3) 1923	(4) 1924
Data for years ending on December 31				
<i>Current income</i> : ²				
Fees (all kinds) paid by the students	\$5,489	\$7,800	\$5,795	\$5,400
Fees paid by patients, in all clinical departments	10,439	6,352	8,275	9,450
Miscellaneous receipts	377	645	None	None
Total amount of current income	\$16,305	\$14,797	\$14,070	\$14,850
<i>Total amount of current expenditures</i>	\$16,300	\$14,750	\$14,000	\$14,800
Net income for the year	5	47	70	50
Accumulated surplus ³	354	401	471	521

¹ See footnote 2 on page 506.

² During the calendar years 1921-24, no surplus was used as current income; there was no appropriation by the State or City, and no income from endowment, investment, or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

³ Held as "current bank funds." The accumulated surplus at the end of 1920 was \$349.

	(1)	(2)	(3)	(4)
Data for years ending on December 31	1921	1922	1923	1924
Dividend or surplus paid to stockholders or others	None	None	None	None
Average amount expended by the School per student (D.D.S.) per year	\$627	\$421	\$389	\$529
Average amount of all student fees paid to the School per student (D.D.S.) per year	211	223	161	193

*Details of expenditures:*¹

For repairs	1,850	2,250	None	None
For new equipment	1,150	750	None	None
For research	None	None	None	None
For improvement of the library	None	None	None	None
For supplies used in the clinical departments	1,060	1,426	2,353	2,282
For salaries: for administration	7,340	7,600	7,736	7,800
For salaries: for teaching	3,900	2,000	2,600	3,500
For all other purposes	1,000	724	1,311	1,218

Salaries for instruction:

(Number of teachers)	(12)	(12)	(14)	(14)
Amount of their salaries (honoraria) as teachers	(All taught at least one subject in each main group and all received small honoraria; all were part-time teachers; several were whole-time officers. See expenditures "For salaries: for teaching," above)			

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 15. Of this total number, 2 were whole-time, 4 half-time, and 9 part-time or occasional teachers; every member of the staff taught at least one subject in each main group; all were "full" professors; none were lecturers by title; all received salaries (honoraria); 8 were teachers with degrees

STUDENTS AND GRADUATES: CINCINNATI COLLEGE OF DENTAL SURGERY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	9	11	26	36	45	28
Women.....	0	0	1	1	1	0
From other countries.....	0	0	0	0	0	0
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	9	11	26	35	36	28
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	1	0	1	1	13	1
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	0	0	0	0	0	0
Denied further instruction because of deficient scholarship.....	0	0	0	0	8	3
GRADUATES (D.D.S.)						
Total number of graduates.....	9	0	0	0	11	13
Women.....	0	..	..	..	1	0
Admitted to practice in other countries.....	0	..	..	..	0	0
Negroes.....	0	..	..	..	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	2	..	..	..	3 ²	2
Percentages of failures in such state-board examinations.....	60.0	..	..	..	0	0

¹ During the calendar years 1921-24, there was no payment on account of debt, rent, new construction, or land.

² Mistakenly given as "2" in the record published by the National Association of Dental Examiners.

other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Summer courses in clinical dentistry (June, July, August, and September): since 1894; attendance: 1922—4; 1923—7; 1924—6; 1925—5

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: none in progress in 1924—25; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: February, 1922

The foregoing data, including obvious discrepancies, have been verified in detail by the Dean or the Secretary

SUMMARY

THIS independent College is one of the three remaining proprietary dental schools in North America, and owes its continuance to other considerations than public demand. It is ineligible for admission to membership in the American Association of Dental Schools. Although it is the smallest school in the United States, having only thirty students, it is conducted at a financial profit, on an income from fees and by the payment of trifling salaries to a Faculty consisting wholly of "professors," some of whom share the infirmary privileges. The annual Announcement of the School for 1925-26 is a four-page folder consisting of the cover-title page, the lecture schedule, a list of the teachers and officers including a "quizz master," and a list of the students. The requirements for admission are not stated. The lecture schedule is reminiscent of the methods of 1840. Thus, on Mondays at 8 a.m., the Freshmen, Sophomores, Juniors, and Seniors are scheduled to attend a weekly lecture on anesthesia. The estimated number of persons treated in the Infirmary is either a mistake (although the Dean has confirmed them), or an indication of conditions, professional and financial, that are extraordinary. The strikingly negative character of the School is revealed on almost every line of the foregoing statistical statement.

The attendance, and the number of graduates during the past four years, are indicated in the accompanying table. The figures show that the first-year classes in 1922-24 contained a total of seven students, but now (December, 1925) these three classes have twenty-four members. Making due allowance for the maximum possible number of "repeaters," this gain indicates that a much larger number of students were admitted to advanced standing than is shown by the Dean's figures in the corresponding tables. It is improbable that earnest and well-advised students would voluntarily leave good schools to segregate at an institution publicly rated Class C. It is more likely that students found incompetent at good schools seek refuge in a Class C school. On the other hand, the ex-

CLASSIFICATION OF THE ATTENDANCE AT THE CINCINNATI COLLEGE OF DENTAL SURGERY: 1922-26

	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>	<i>Graduates</i>
1922-23	0 ¹	10	14	12	36	11
1923-24	0	0 ¹	12	16	28	13
1924-25	7	2	2 ¹	15	26	12
1925-26	6	10	6	8 ¹	30	..

¹ The first group affected by the present nominal entrance requirement of one year of work in an academic college.

traordinary success of this School's graduates in state-board examinations in 1923 and 1924, especially in Ohio, might have suggested to some students that the School affords an exceptional practical training. Most of the students reside in Ohio, where the deficiencies of the School are widely known. The geographical distribution of the students, in 1924-25, is indicated in the accompanying table. Comparative data relating to students, graduates, and results of license examinations, are given on pages 506 and 507.

GEOGRAPHICAL DISTRIBUTION OF THE MAXIMUM NUMBER OF STUDENTS AT THE CINCINNATI COLLEGE OF DENTAL SURGERY: 1924-25

States (11)	First year	Second year	Third year	Fourth year	Total
Kentucky	2	0	0	0	2
Ohio	6	1	3	10	20
West Virginia	1	0	0	3	4
California, Illinois, Maine, Massachusetts, Missouri, Oklahoma, Pennsylvania, Vermont — one each	2	1	1	4	8
Total	11	2	4	17	34

There is no need for a proprietary dental school anywhere in the United States. The union of the friends of this School with those of the Ohio College of Dental Surgery, in active support of an earnest effort to establish a good school at the University, would be the best service each group could render to dental education in general and to oral health-service for the citizens of Cincinnati in particular.

CLEVELAND

Population: 924,493. Number of dentists, 730; physicians, 1397. Ratios: dentists to population, 1:1266; physicians to population, 1:662; dentists to physicians, 1:1.9
Number of dental clinics or infirmaries, 19; hospitals, sanatoriums, and charitable institutions, 37; hospitals approved for internships, 7

Dental School: Western Reserve University. *Medical School:* Western Reserve University

SCHOOL OF DENTISTRY, WESTERN RESERVE UNIVERSITY

Location: Adelbert and Cummington Roads; four and one-half miles from the centre of the city

General character: integral part of Western Reserve University

Organized: in 1892; housed in the building of the Medical School until 1896; completely reorganized in 1917, after some years of financial adversity (1896-1908), and a long period of proprietary perversity (1908-17)

Building: erected in 1917; special improvements were made in 1921, 1922, and 1923; total floor area, 23,815 sq. ft. Situated on the site of the University; distance from the old buildings of the Medical School, four miles. The new buildings of the Medical School, opposite the dental building on Cummington Road, were occupied on June 1, 1924

Infirmary: in the dental building, with seven accessory rooms; total floor area, 7098 sq. ft. Total number of chairs in active use, 93, including groups reserved for special purposes: prosthodontia, 12; root-canal treatment, 8; examination, extraction, and roentgenography, 1 each

Relation of the School of Medicine (Class A): dental students are given instruction in the

medico-dental subjects in the laboratories of the Medical School (biological chemistry in the dental building), by teachers who, in most cases, are members of both the Medical and Dental Faculties, although primarily of the latter; but a few are teachers mainly of medical students. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction in 1924-25: City Hospital (eight miles)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for all phases of medicine and surgery

Number of dental internships or externships, held by officers or students of the School, in the Hospital in 1924-25: none

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: observation of pathological conditions and post-mortem technique; microscopic study of diseased conditions; study of gross specimens at autopsies

Library (in the dental building): room, 352 sq. ft.; half-time librarian. Contains 1668 bound and 1475 unbound volumes, and 110 pamphlets (all effectively card indexed).

*Of the volumes, approximately all relate to dental subjects. The Library includes that of the former Research Institute of the American Dental Association (page 159)

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Libraries of the University, Medical School, and Case School of Applied Science (also of the Cleveland Medical Library Association; building, adjacent to the University campus, now in process of construction and to be occupied in December, 1926)—all in the University centre

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: four students; total amount, about \$1000, which was provided by the U. S. Veterans Vocational Bureau

Dean: part-time officer; also Professor of Orthodontia. *Assistant to the Dean*: whole-time officer; also Professor of Histology and Embryology in the Schools of Medicine and Dentistry. *Dean's executive assistant*: Registrar; whole-time officer

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1922)

Next prospective advance in the minimum academic requirement for admission: two years of approved work in an accredited academic college, beginning in September, 1927

Number of graduates (1894-1925): 1006; average per year, for thirty-two years, 31

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 180; proportion from Ohio: 1922-23—91 per cent; 1923-24—92 per cent; 1924-25—93 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—4138; 1921-22—4222; 1922-23—7589; 1923-24—7198; 1924-25—5910

Number of visits: 1920-21—41,380; 1921-22—33,776; 1922-23—45,534; 1923-24—42,188; 1924-25—35,460

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-25—none

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$183,400, and equipment, \$63,008; total, \$246,408 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): \$229,025. Of this amount, \$200,000 "stands as a university obligation, which is not a dental school debt but a university debt," at 6 per cent interest per annum; \$29,025 is "an unpaid balance on equipment," which is "carried in suspense account against the School and for which the University has loaned its credit. No interest is charged against this amount"

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on June 30				
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$50,329	\$65,703	\$50,984	\$37,775
Fees paid by patients, in all clinical departments	28,411	38,492	60,753	49,038
Miscellaneous receipts	148	363	625	600
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	None	None
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	60,000	60,000	60,000	60,000
Total amount of current income	\$138,888	\$164,558	\$172,362	\$147,413
<i>Total amount of current expenditures</i>	\$153,770	\$152,264	\$171,437	\$160,197
Deficit ²	14,882	...	...	12,784
Surplus for the year	...	12,294	925	...
Accumulated surplus for the use of the Dental School ³	15,483	27,777	28,702	15,918
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above ⁴	60,000	47,706	59,075	60,000
Average amount expended by the School per student (D.D.S.) per year	739	651	893	1,090
Average amount of all student fees paid to the School per student (D.D.S.) per year	242	281	266	257
<i>Details of expenditures:</i> ⁵				
For interest on debt	12,033	12,167	12,167	14,878
For repairs	2,381	1,043	1,397	1,104
For new equipment	2,381	851	38	1,107
For research	1,773	1,102	710	474
For improvement of the library	None	225	353	158

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² Paid from the "Accumulated surplus," below.

³ The accumulated surplus for 1919-20 was \$30,365.

⁴ The surplus, which under ordinary conditions would have been used for the reduction of the debt, has been allowed to accumulate against deficits that may follow decrease in the number of students caused by the recent advance in the academic requirement for admission. Deficits of \$14,882 and \$12,784 in 1920-21 and 1923-24, respectively, were paid from this accumulation. (In 1922, when the School first required one year of work in an academic college for admission, the number of first-year students was 8; since then it has been 25 in 1923; 52 in 1924; and 75, the maximum number admissible, in 1925. The total attendance fell from 234 in 1921-22 to 158 in 1925-26. Student fees were increased by about \$60 per student, beginning in 1924-25.)

⁵ During the academic years 1920-24, there was no reduction in the amount of the debt, and no payment for rent, new construction, or land.

DENTAL SCHOOLS IN THE UNITED STATES

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
For supplies used in the clinical departments	\$4,852	\$10,128	\$24,521	\$16,382
For salaries: for administration	4,710	4,644	4,718	5,440
For salaries: for teaching	72,113	74,050	76,108	76,259
For all other purposes	53,527	48,054	51,425	44,395
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(21)	(24)	(27)	(22)
Amount of their salaries as teachers	23,873	26,550	29,850	31,159
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	4,000	4,000	4,000	4,500
Smallest salary paid to a whole-time teacher of a dental subject	2,000	1,575	1,575	1,425
(Number of teachers of academic or medico-dental subjects)	(18)	(15)	(15)	(23)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	48,240	47,500	46,258	45,100
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	3,500	3,500	3,500	3,500
In the Medical School	7,000	7,000	7,000	7,500
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	2,300	2,300	2,300	2,000
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	31,350	31,350	31,350	31,350

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 42. Of this total number, 12 were whole-time, none half-time, and 7 part-time or occasional teachers of academic or medico-dental subjects; 4 were whole-time, 7 half-time, and 12 part-time or occasional teachers of dental subjects; 4 were whole-time teachers in the Dental School only; 10 were "full" professors; 9 were associate or assistant professors; 5 were lecturers by title; all received salaries; 25 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

No combined curricula leading to the degrees of B.S. or B.A., and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry;¹ no dental extension teaching

Research: actively in progress in 1924-25, on the development and structure of enamel; comparative structure of enamel in certain mammals; relation of systemic diseases of children to growth and malformation of teeth; no publication by teachers of dental subjects in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

¹Clinical instruction is usually given informally throughout the summer months except August.

STUDENTS AND GRADUATES: SCHOOL OF DENTISTRY, WESTERN RESERVE UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	154	191	230	254	197	147
Women.....	4	0	1	0	0	0
From other countries.....	0	0	0	0	2	2
Negroes.....	4	8	9	12	8	5
Attendance at the end of the year.....	143	174	208	234	192	147
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	3	4	4	2	1	1
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	0	0	2	9	3	9
Denied further instruction because of deficient scholarship.....	2	3	9	16	3	3
GRADUATES (D.D.S.)						
Total number of graduates.....	58	8	34	36	67	50
Women.....	3	0	1	0	0	0
Admitted to practice in other countries.....	1	0	1	0	0	0
Negroes.....	0	1	1	2	3	2
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	1	1	1	1	2	1
Percentages of failures in such state-board examinations.....	23.9	0	14.8 ¹	0	0	0

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: March, 1922; May and September, 1923; December, 1925

The foregoing data have been verified in detail by the Dean

SUMMARY

THE recent removal of the Medical School to the new site opposite the Dental School favors close coördination between the Faculties, which previously, despite earnest endeavors by several members of the Medical Faculty to make their teaching of the medical sciences helpful to the Dental School, was embarrassed by the distance between the two schools. Intimate correlation between clinical medicine and clinical dentistry in the instruction of both medical and dental students has been wanting, but should now be attainable. The hospital affiliation for the Dental School does not appear to be very useful either to the Hospital or the School, but the accessibility of the Babies' and Children's Hospital, facing the Medical School, suggests the development there of practical opportunities of value for both the children and the dental students. Lack of funds has prevented the University from giving the School the financial support required to raise the quality of the teaching of the dental subjects to the high grade of that of the medical sciences. There was a deficit of \$25,544 in 1924-25.

The School has been obliged to pay from current income a heavy annual charge for interest on an old debt "which is not a dental school debt but a university debt" (\$14,749 for interest in 1924-25), and is also expected ultimately to earn a surplus with which to liquidate an "unpaid balance on equipment" (\$29,025). These financial obstacles have materially retarded the School's development and are impairing its efficiency. To help the School in this emergency, the tuition fee, which was \$225 in 1920-21 and \$250 during 1921-25, has been raised to \$300, and fees for infirmary service have been increased. In recent years the University has not appropriated funds additional to dental income for the support of the School. Therefore, considering the small total attendance—146 in 1923-24, for example, when there were only 25 first-year students and 13 second-year

¹ The official record gives a percentage of 15.2. The correction has been made with the approval of the Ohio State Board of Dental Examiners.

students—the estimates of the amounts of funds annually expended *indirectly* in behalf of the School (\$60,000), as recorded above, are unusually liberal. The large “average amount expended by the School per student” (\$1090 in 1923–24), which includes a corresponding share of the estimated indirect values, confirms this opinion.

Most of the dental teachers are busy practitioners. Their salaries are very low. In 1923–24 twenty-two teachers of dental subjects, four of them giving whole-time service, received \$31,159, of which the highest salary was \$4500; in 1924–25, the total was only \$28,440 for twenty-three teachers, including four on whole-time duty. The difference between the maximum whole-time salaries in the Medical and Dental Schools is unfavorable to the development of teaching in dentistry. Thus far the School has confined its attention to the undergraduate curriculum. Its teachers of dental subjects have not been active in research, the special expenditures for which have steadily diminished from \$1773 for 1920–21 to nothing for 1924–25. The Research Institute of the National Dental Association (one and one-half miles) was not in any way related to the University. In 1920, when the Institute was closed (page 159), its library was obtained for the School.

This Dental School is associated with one of the leading medical schools and, if given commensurate financial support, could be made a leading factor for the promotion of dental education in close accord with medical education, particularly in the most advanced aspects of each. The University has recently received millions for the improvement of its Medical School. A million more for the removal of the debt on the Dental School, and for the promotion of all aspects of education in oral health-service, could be expended to the very great advantage of Cleveland and Ohio.

Although the Medical School is one of the best and teaches the undergraduates the conventional medical specialties, oral health-service is not represented in the list of subjects in the curriculum and appears to be neglected in the instruction. None of the teachers of dental subjects is a member of the Medical Faculty.

At present 92 per cent of the students reside in Ohio (page 506). In 1924–25, of 144 students, only ten were non-resident—7 in Pennsylvania, and 1 each in Austria, Michigan, and New York. Comparative data relating to students, graduates, and results of license examinations, are given on pages 506 and 507.

COLUMBUS

Population: 271,022. Number of dentists, 227; physicians, 599. Ratios: dentists to population, 1:1194; physicians to population, 1:452; dentists to physicians, 1:2.6
Number of dental clinics or infirmaries, 5; hospitals, sanatoriums, and charitable institutions, 20; hospitals approved for internships, 4

Dental School: Ohio State University. *Medical School:* Ohio State University

COLLEGE OF DENTISTRY, OHIO STATE UNIVERSITY

Location (Hamilton Hall): on the main site of the University; two miles from the centre of the city

General character: integral part of Ohio State University

Organized: in 1914, by absorption of the Dental Department of the Starling-Ohio Medical College (1907–14) when the College became a part of the University. The Starling-Ohio Medical College was formed, in 1907, by the union of the Starling Medical College (1847–1907) and the Ohio Medical University (1892–1907). The Dental Department of the Starling-Ohio Medical College had previously been the College of Dentistry of the Ohio Medical University, in which it existed from the organization of the latter in 1892

Building (Hamilton Hall): erected in 1924-25; entire north wing devoted to dental purposes and occupied since February 8, 1925; used jointly with the School of Medicine; total floor area used for the instruction of dental students, 22,000 sq. ft. (Now undergoing enlargement; see footnote 2, on page 502)

Infirmery: in Hamilton Hall, with four accessory rooms; total floor area, 6452 sq. ft. Total number of chairs in active use, 66, including groups reserved for special purposes: prosthodontia, 17; extraction, 2; anesthesia, examination, and orthodontia, 1 each

Relation of the School of Medicine (Class A): all of the medico-dental subjects are taught to the dental students in separate classes, in the laboratories of the Medical School, by members of the Medical Faculty. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Dispensary and Hospital in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: Children's Hospital (five miles), and Tuberculosis Dispensary (three miles)

Clinical facilities in the Dispensary and Hospital where dental students received instruction in 1924-25: complete for operative dentistry, on children particularly

Number of dental internships or externships, held by officers or students of the School, in the Dispensary and Hospital in 1924-25: none. During the year each of twenty-two seniors devoted about forty hours to the work at the Children's Hospital, and one day at the Tuberculosis Dispensary

Nature and specific purposes of the accredited instruction given elsewhere than in the dental building, in 1924-25: experience mainly in prophylaxis and plastic fillings; to teach oral hygiene and operative dentistry, and to develop the spirit of public service

Library (primarily medical): room, 1215 sq. ft.; whole-time librarian. Contains 3777 bound and 712 unbound volumes, and 50 pamphlets (all effectively card indexed). Of the volumes, approximately 700 relate to dental subjects

Library facilities additional to those in Hamilton Hall that are conveniently accessible to dental students: University Library

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: whole-time officer; also Professor of Operative Dentistry and Dental Anatomy. *Associate Dean* (or equivalent officer): none. *Secretary*: whole-time officer; also Professor of Prosthetic Dentistry

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: uncertain

Number of graduates (1915-25): 388; average per year, for eleven years, 35. (Number for the College of Dentistry of the Ohio Medical University, 1894-1907—460; average per year, for fourteen years, 33. Number for the Dental Department of the Starling-Ohio Medical College, 1908-14—249; average per year, for seven years, 36)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 151; proportion from Ohio: 1922-23—96 per cent; 1923-24—98 per cent; 1924-25—94 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—1611; 1921-22—1921; 1922-23—3441; 1923-24—3800; 1924-25—3493

Number of visits: 1920-21—6500; 1921-22—7500; 1922-23—12,000; 1923-24—13,000; 1924-25—12,114 (the figures for 1920-24 are estimates)

Number of patients treated in the Dispensaries and Hospital, by dental students under the supervision of representatives of the Dental School: 1920-21 — 480; 1921-22 — 502; 1922-23 — 600; 1923-24 — 512; 1924-25 — 511

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value of land and building, \$258,970, and equipment used by the Dental School, \$45,000; total, \$303,970 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): none

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$19,529	\$18,047	\$21,960	\$18,438
Fees paid by patients, in all clinical departments	6,839	9,263	15,588	22,001
University funds, additional to the income designated above:				
(a) Direct appropriation	9,564	11,121	9,010	10,000
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	15,000	16,000	18,000	18,000
Total amount of current income	\$50,932	\$54,431	\$64,558	\$68,439
<i>Total amount of current expenditures</i>	\$50,932	\$54,431	\$64,558	\$68,439
Amount expended for the School by the University, in excess of dental income, and included in "University funds" above	24,564	27,121	27,010	28,000
<i>Capital expenditure</i> (additional), by the University:				
For the new building	None	None	None	62,104 ²
Average amount expended by the School per student (D.D.S.) per year	258	318	399	475
Average amount of all student fees paid to the School per student (D.D.S.) per year ³	99	106	136	128
<i>Details of current expenditures:</i> ⁴				
For repairs	1,500	None	2,500	654
For new equipment }				
For new construction (no land)	1,500	None	None	None ²
For research	None	None	None	None
For improvement of the library	100	150	100	250
For supplies used in the clinical departments	3,135	4,654	7,798	9,012
For salaries: for administration	3,740	4,040	4,600	4,200

¹ During the academic years 1920-24, there was no surplus, no appropriation by the State directly, or by the City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

² The old Park Street building, which was vacated by the Medical and Dental Schools, was sold for \$60,000. The additional expenditure, in 1924-25, for the completion of the new building, was \$191,866; for equipment, \$25,000. At a recent session (April, 1925), the State Legislature appropriated \$200,000 additional for the enlargement of the dental section of Hamilton Hall to about twice its present size. The new construction is in progress (March 1, 1926), and will be completed early in the fall.

³ The tuition fee for students from states other than Ohio, in 1920-22, was \$25 more than that for Ohio students; in 1922-25 the difference was \$100; now (1925-26) it is \$105.

⁴ During the academic years 1920-24, there was no payment on account of debt or rent.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
For salaries: for teaching	\$36,300	\$38,300	\$42,100	\$48,100
For all other purposes	4,657	7,287	7,460	6,223
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(16)	(16)	(16)	(18)
Amount of their salaries as teachers	21,300	22,300	24,100	30,100
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	2,000	2,000	2,400	5,000
Smallest salary paid to a whole-time teacher of a dental subject	2,000	2,000	2,400	2,400
(Number of teachers of academic or medico-dental subjects)	(17)	(17)	(17)	(17)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	15,000	16,000	18,000	18,000
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	5,000	6,000	6,000	6,000
In the Medical School	6,000	6,000	6,000	6,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,800	1,800	2,100	2,400
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	7,500	9,000	10,000	10,000

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 35. Of this total number, 17 were whole-time, none half-time, and none part-time or occasional teachers of academic or medico-dental subjects; 4 were whole-time, 5 half-time, and 9 part-time or occasional teachers of dental subjects; 1 taught both general types of subjects; 4 were whole-time teachers in the Dental School only; 8 were "full" professors; 11 were assistant professors; none were lecturers by title; all received salaries; 23 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. or B.A., and D.D.S.: since 1921; now six years in length for B.S. and D.D.S. — seven years, for B.A. and D.D.S.

Summer courses in clinical dentistry (July, August, and September): since 1923; attendance: 1923—34; 1924—11; 1925—none

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: none in progress in 1924-25, but about \$1000 has been expended for the purchase of equipment for a projected study of physical properties of plasters, investments, and similar materials of value in prosthodontia; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in commu-

STUDENTS AND GRADUATES: COLLEGE OF DENTISTRY, OHIO STATE UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	124	167	215	171	168	153
Women.....	1	1	3	2	3	4
From other countries.....	0	0	0	0	0	0
Negroes.....	4	4	8	6	8	9
Attendance at the end of the year.....	86	158	197	171	162	144
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	1	0	0	1	0	1
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	15	26	39	31	18	35
Denied further instruction because of deficient scholarship.....	16	5	7	11	7	8
GRADUATES (D.D.S.)						
Total number of graduates.....	15	29	17	19	58	63
Women.....	0	0	0	0	0	2
Admitted to practice in other countries.....	0	0	0	0	0	0
Negroes.....	1	0	0	0	2	2
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	1	3	1	2	1	2
Percentages of failures in such state-board examinations.....	18.7	17.9	11.8	0	2.0	0

nities particularly in need of dental service, but a card index of the names and addresses of the alumni is now being compiled as a basis for an active effort in this relation

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: March, 1922; September, 1925

The foregoing data have been verified in detail by the Dean

SUMMARY

Most of the foregoing data apply to conditions in the Park Street Building, where the School was unable to grow. In the judgment of the Dental Educational Council, the School fell from Class A grade in 1918 to Class B grade in 1923. The recent removal of the School to the main site of the University, close association there with all departments of the Medical School in a fine new building occupied by the two schools jointly, provision of new equipment in accord with the needs of the School, assurance of support commensurate with its capabilities in health service, and an additional appropriation of \$200,000 by the State Legislature for the immediate enlargement of the dental wing of the new building to about twice its present size, have rejuvenated the School. These conditions have also heartened its teachers, expanded its scholastic and professional opportunities, and raised it to a degree of educational opportunity and responsiveness that will assure its early formal restoration to the grade of Class A. The University has provided the new building and equipment without requiring the School to repay any portion of the ensuing expenditures. Prospective early improvement in the status of the teachers, including increase in their number and more reasonable salaries, will undoubtedly be followed also by activity in research, by effective instruction in the correlations between clinical dentistry and clinical medicine, and by the development of graduate work, in all of which the School has been deficient.

Although there are no courses in odontology, stomatology, or clinical dentistry in the Medical School, the Instructor in Oral Surgery in the Dental School, who is also Assistant Professor of Surgery in the Medical School, includes oral surgery in the work required of medical students in surgery. The chief hospitals and dispensary closely associated with

the Medical School (Starling-Loving Hospital, St. Francis Hospital, and State Street Dispensary) are deficient in oral health-service, although the conventional specialties of medicine receive the customary attention.

Approximately 95 per cent of the students reside in Ohio (page 506). In 1924-25, of 138 students, only 8 were non-resident—2 in Pennsylvania, and 1 each in Egypt, Florida, Germany, Indiana, Michigan, and West Virginia. The tuition fee, which amounts to only \$150 (one-half of that at Western Reserve, for example), is kept low by the University for the benefit of citizens of Ohio.¹ But in the execution of this economic policy, the School, to continue its growth, will need for current expenses a larger proportion of the available general funds than that previously allotted to it. Appreciation of this condition is indicated by the fact that the direct appropriation for the current needs of the School, in 1924-25, was fully \$10,000 more than any preceding one.

Comparative data relating to students, graduates, and results of license examinations, are given on pages 506 and 507.

GENERAL COMMENT

OHIO with four dental schools equals the State of New York in containing the largest number. There are also six dental schools in the five states that immediately surround Ohio—Pennsylvania, 3; West Virginia, 0; Kentucky, 1; Indiana, 1; Michigan, 1. Of the four schools in Ohio, two are integral parts of universities and closely associated with medical schools. Two, situated in Cincinnati, are privately owned, one of which is temporarily affiliated with the University pending prospective organic union, the other being independent.

The usefulness of these schools, to Ohio in recent years, is suggested by the data on page 506 relating to students and graduates. All of these schools claim to enforce the same general entrance requirement and therefore may be directly compared. Those in Ohio State and Western Reserve are now strongly preferred, and are clearly the best. The attendance at each of these two university schools, after initial losses due to elevation of their standards of admission, has begun to rise and promises steadily to increase to each school's maximum. The annual total number of graduates of the four schools rose to 192 in 1923 but decreased to 138 in 1925. The total number in 1926 will not exceed 81, but beginning in 1927 will presumably again increase and continue toward a new maximum.

The total attendance at the proprietary Ohio College rose steadily after 1919-20, before its affiliation with the University of Cincinnati (from 97 to 195). But as this affiliation involved adoption of an entrance requirement of one year of approved work in an accredited academic college beginning in 1924-25, and thus brought the School into direct competition with schools of higher grade, the attendance fell from 195 at the end of 1923-24 to 115 in 1925-26 (December, 1925), a loss of 41 per cent. This decrease will probably continue unless the School becomes an integral part of the University of Cincinnati and receives adequate financial support.

Early reduction in the number of schools in Cincinnati from two to one and the development of that School as an integral part of the University of Cincinnati, in close coördination with the Medical School, are plainly indicated as the next important steps in the general improvement of dental education in Ohio. With many good schools in the adjacent states to help to meet Ohio's dental needs, three schools in this state could not

¹ Every student who is not a legal resident of the state is required to pay a non-resident fee of \$35 at the beginning of each quarter of his residence in the University, in addition to the tuition fee and other university fees.

DATA PERTAINING TO THE DENTAL SCHOOLS IN THE STATE OF OHIO: 1919-26

Total attendance

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Ohio College (University of Cincinnati)	97	128	170	194	195	158 ¹	115
Cincinnati College	11	23	35	36 ¹	28	26	30
Western Reserve	174	208	234	192 ¹	146	142	158
Ohio State	158	197	171 ¹	162	145	138	192
Total	440	556	610	584	514	464	495

Proportion of students resident in Ohio

Ohio College (University of Cincinnati)	43	48	47	52	55	57	65
Cincinnati College ²	90	90	90	80	80	59	85
Western Reserve	91	90	91	91	92	93	92
Ohio State	92	90	89	96	98	94	95

Number of graduates

Ohio College (University of Cincinnati)	18	13	19	56	41	50	42 ³
Cincinnati College	0	0	0	11	13	12	8 ³
Western Reserve	8	34	36	67	50	54	13 ³
Ohio State	29	17	19	58	63	22 ¹	18 ³
Total	55	64	74	192	167	138	81

Classification of the total attendance

		First year	Second year	Third year	Fourth year	Total
Ohio College (University of Cincinnati):	1923-24	59	43	52	41	195
	1924-25	7 ¹	57	44	50	158
	1925-26	11	10 ¹	52	42	115
Cincinnati College:	1923-24	0	0 ¹	12	16	28
	1924-25	7	2	2 ¹	15	26
	1925-26	6	10	6	8 ¹	30
Western Reserve:	1923-24	25	13 ¹	58	50	146
	1924-25	50	23	13 ¹	56	142
	1925-26	71	50	24	13 ¹	158
Ohio State:	1923-24	45	19	17 ¹	64	145
	1924-25	54	43	19	22 ¹	138
	1925-26	77	55	42	18	192

hope to merit public approval if they were not given the quality of well-supported university departments. A fourth school in Ohio is plainly redundant. The practical solution of these problems clearly presents to the dental profession of Ohio a special opportunity for important public service, and merits the direct attention of the Ohio Dental Board, the Ohio State Dental Society, and the Cincinnati Dental Society. The Dental Educational Council of America, containing representatives of the National Associa-

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

² These estimates by the School do not appear to be accurate. The one for 1924-25 was given as 85 per cent, but the data in the table on page 495 indicate that the percentage was 59 instead.

³ The number of seniors (December, 1925).

tion of Dental Examiners and having an abundance of pertinent information, might suitably initiate action. The desirability of a profession's organized interest, criticism, and coöperation in the study of important educational problems affecting it, and the value of its hearty support of the most equitable and useful solutions that might be formulated in the public interest, could now be shown to very great advantage in Cincinnati.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the Ohio schools who failed, in the number of states indicated by the figures in parenthesis:

1925.—Cincinnati College, 16.7 (3); Ohio College, 23.9 (6); Ohio State, none (1); Western Reserve, none (1); U. S. schools collectively, 11.3.

1910-25 (cumulative).—Cincinnati College, 27.3 (11); Ohio College, 22.4 (23); Ohio State, 7.6 (10); Western Reserve, 13.5 (5); U. S. schools collectively, 14.2.

OKLAHOMA

Population: 2,219,422. Number of dentists, 746; physicians, 2524. Ratios: dentists to population, 1:2975; physicians to population, 1:879; dentists to physicians, 1:3.4

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited four-year high school. Professional training: graduation from a reputable dental school approved by the Board. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school; in addition, at the Board's option, one year of service as an interne in an approved hospital

Dental school: none; medical school: University of Oklahoma

OREGON

Population: 840,362. Number of dentists, 870; physicians, 1176. Ratios: dentists to population, 1:966; physicians to population, 1:715; dentists to physicians, 1:1.4

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a high school accredited by the University of Oregon, or the equivalent. Professional training: graduation from a dental school recognized by the Board. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college as required by Class A schools. Professional training: graduation from a Class A medical school

Location of the dental school: Portland; medical school: Portland

PORTLAND

Population: 280,192. Number of dentists, 463; physicians, 582. Ratios: dentists to population, 1:605; physicians to population, 1:481; dentists to physicians, 1:1.3

Number of dental clinics or infirmaries, 2; hospitals, sanatoriums, and charitable institutions, 27; hospitals approved for internships, 5

Dental School: North Pacific College of Oregon. *Medical School*: University of Oregon

SCHOOL OF DENTISTRY, NORTH PACIFIC COLLEGE OF OREGON

Location: East Sixth and Oregon Streets; one-half mile from the business centre of the city and at about the centre of population

General character: integral part of North Pacific College of Oregon, which is an independent institution consisting of the School of Dentistry and a subsidiary School of Pharmacy

Organized: in 1898, as the Oregon College of Dentistry. In 1900 the Tacoma (Washington) College of Dental Surgery was united with it and the consolidated dental schools became the North Pacific College of Dentistry, which remained a dental school exclusively until 1908 when a School of Pharmacy was added, although the corporate name of the College was not changed. The College was proprietary until January 22, 1924, when it was reincorporated as a public trust, under its present name, and is now conducted by a Board of Trustees in conformity with the laws of Oregon that regulate "benevolent, literary and educational" institutions

Buildings (two): one erected in 1911, another in 1918, and a large annex added in 1921; total floor area (practically all in use by the School of Dentistry), 66,000 sq. ft. During 1922-24 the Laboratory for Physics was located in a rented room (1750 sq. ft.) in a nearby building (two blocks); rearrangements in the annex now provide room there for this laboratory

Infirmary: in the main building, with four accessory rooms; total floor area, 11,060 sq. ft. Total number of chairs in active use, 165, including groups reserved for special purposes: prosthodontia, 12; orthodontia, 6; extraction, and oral surgery, 2 each

School of Medicine: associated with none. In January, 1925, the College established a Diagnostic Clinic covering the field of medicine and surgery, which occupies eight rooms (2228 sq. ft.) in the main building. Dental students receive instruction in this Clinic, which is open three hours daily—three days weekly for medicine, two for surgery, and one for children's diseases. Number of patients treated in 1925 (January-December), 730

Hospital and Home in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: St. Vincent's Hospital (two miles) and St. Mary's Home (seven miles)

Clinical facilities in the Hospital and Home where dental students received instruction in 1924-25: adequate for dentistry in the Home and for general surgery in the Hospital

Number of dental internships or externships in the Hospital or Home, in 1924-25: none

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: clinics in general surgery and oral surgery for seniors in St. Vincent's Hospital; children's clinic for seniors in St. Mary's Home. Students perform operations at the Home and make observations at the Hospital; at the former under the guidance of members of the Faculty. The work is intended to give the students broad views and wide knowledge of the scope of dentistry

Library (for both Schools): room, 1444 sq. ft.; whole-time librarian. Contains 1450 bound and 120 unbound volumes, and 300 pamphlets (all the bound volumes effectively card indexed). Of the volumes, approximately 600 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Portland Public Library (three-fourths mile) and a Branch (one-half mile); not in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

President: whole-time officer; also Professor of Clinical Dentistry. *Dean*: whole-time officer; also Professor of Operative Dentistry. *Associate Dean* (or equivalent officer): none.

Dean's executive assistant: business manager; whole-time officer

Minimum academic requirement for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (15 units), or its equivalent (since 1909)

Next prospective advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926

The School will lengthen its curriculum to five years, the first of which will be devoted to academic subjects, including several courses to test vocational aptitude; and full-year graduate curricula will be inaugurated. Students who have completed the equivalent of one year of approved work in an accredited academic college will be admitted to the second year of the five-year curriculum. Qualified students will receive the B.S. degree at the end of the fourth year, D.M.D. at the end of the fifth year. The M.S. and D.D.Sc. degrees will be awarded to successful graduate students. The College has been empowered by its new charter to grant the B.S. degree and other academic degrees

Number of graduates (1900-25): 1504; average per year, for twenty-six years, 58. (Number for the Oregon College of Dentistry, in 1900-5. Number for the Tacoma College of Dental Surgery, 1896-1900-23; average per year, for five years, 5)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 407; proportion from Oregon: 1922-23-34 per cent; 1923-24-33 per cent; 1924-25-41 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21-5335; 1921-22-8620; 1922-23-10,977; 1923-24-12,902; 1924-25-12,413

Number of operations: 1920-21-16,645; 1921-22-26,894; 1922-23-34,248; 1923-24-40,254; 1924-25-38,728 (the figures are estimates)

Number of patients treated in the Home (none in the Hospital), by dental students under the supervision of representatives of the Dental School: 1920-21-none; 1921-22-75; 1922-23-125; 1923-24-118; 1924-25-96

Rated Class A by the Dental Educational Council of America (March 5, 1924); last previous rating (July 1, 1923), Class B

FINANCIAL DATA

Estimated value of land and buildings, \$239,500, and equipment, \$86,886; total, \$326,386 (December 31, 1925)

General debt on the School (December 31, 1925): \$182,000 at 6 per cent interest per annum

Accumulated net assets (December 31, 1925): \$144,386

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$94,626	\$123,331	\$131,354	\$125,284
Fees paid by patients, in all clinical departments	37,686	45,168	64,796	63,722
Income from the "supply department," including gain or loss in the conduct of the "College Inn"	12,265	13,308	10,750	None
Miscellaneous receipts	983 ²	245	1,821	240
Total amount of current income	\$145,560	\$182,052	\$208,721	\$189,246
Total amount of current expenditures	\$119,932	\$174,563	\$181,034	\$196,081
Net income for the year	25,628	7,489	27,687	...
Deficit for the year	...	...	...	6,835

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment, investment, or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² This amount includes \$626 in fees paid by students for health service in the College. Such fees in the years since 1920-21 are included in the "fees paid by patients in all clinical departments."

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Accumulated surplus	\$35,455	\$40,505	\$46,784	\$11,354
Dividend paid to stockholders	None	None	None	None ¹
Average amount expended by the School per student (D.M.D.) for the year	269	303	291	381
Average amount of all student fees paid to the School per student (D.M.D.) per year	212	214	211	244
<i>Details of expenditures:</i>				
For reduction in principal of debt	None	None	None	None
For interest on debt	2,715	2,300	2,300	2,240
For rent	None	None	None	450 ²
For repairs	3,621	3,099	5,875	4,877
For new equipment	5,531	13,460	12,520	5,000
For new construction (no land)	None	28,432	None	None
For research	None	150	200	200
For improvement of the library	None	127	240	164
For supplies used in the clinical departments	9,827	14,584	19,097	18,139
For salaries: for administration	12,668	14,564	15,890	15,790
For salaries: for teaching	55,331	68,000	81,002	85,391
For all other purposes	30,239	29,847	43,910	63,780
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(22)	(28)	(35)	(23)
Amount of their salaries as teachers	40,939	50,267	56,463	46,745
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	4,000	4,000	4,000	4,000
Smallest salary paid to a whole-time teacher of a dental subject	1,200	1,200	1,200	1,200
(Number of teachers of academic or medico-dental subjects)	(15)	(16)	(21)	(32)
Amount of their salaries as teachers	14,392	17,733	24,539	38,646
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	3,000	3,000	3,000	3,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,200	1,200	1,200	1,200

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 53. Of this total number, 8 were whole-time, 5 half-time, and 14 part-time or occasional teachers of academic or medico-dental subjects; 13 were whole-time, 3 half-time, and 10 part-time or occasional teachers of dental subjects; 3 taught both general types of subjects; 14 were whole-time teachers in the Dental School only; 18 were "full" professors; 1 was an assistant professor, and 1 a clinical professor; 6 were lecturers by title; 1 received no salary; 31 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Course for dental mechanics: since 1918; attendance: 1921-22—none; 1922-23—9; 1923-24—none; 1924-25—none

Course for dental assistants (women): since 1918; attendance: 1921-22—none; 1922-23—2; 1923-24—3; 1924-25—2

¹ The School ceased to be proprietary on January 22, 1924.

² A rental for the Physical Laboratory. See "Buildings," above.

STUDENTS AND GRADUATES¹

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.M.D.)						
Maximum attendance.....	281	311	462	590	668	522
Women.....	5	2	2	1	2	1
From other countries; chiefly from Canada.....	28	45	70	81	92	69
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	245	288	446	577	623	514
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	7	1	4	12	10	8
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	20	67	38	58	82	47
Denied further instruction because of deficient scholarship.....	5	9	6	9	18	5
GRADUATES (D.M.D.)						
Total number of graduates.....	124	9	34	57	162	144
Women.....	4	0	1	0	1	1
Admitted to practice in other countries.....	No available data					
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	5	1	3	4	7	5
Percentages of failures in such state-board examinations.....	20.4	60.0	10.0	9.4	10.1	33.1

Summer courses in clinical dentistry (June, July, August, and September): since 1911; attendance: 1922—84; 1923—76; 1924—60;² 1925—90

No combined curricula leading to the degree of B.S. or B.A., and D.M.D.;³ no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no dental extension teaching

Research: actively in progress in 1924-25, on the comparative efficiency of methods for the sterilization of wrapped broaches; influence of arsenic upon tissues beyond roots of teeth when used to devitalize pulps; no publication in 1924 or 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: active correspondence with communities in Oregon and adjacent territory reveals localities in need of dental service and large enough to support dentists; these facts are presented to the students

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual practice, or in other related professional service, such as teaching or research

Visited: April, 1922

The foregoing data have been verified in detail by the President

SUMMARY

THIS College, and Harvard and Tufts, are the only institutions in North America that award D.M.D. instead of D.D.S. as the general degree in dentistry. The College contains a School of Pharmacy, but it is so completely incidental that the North Pacific College of Oregon is practically a School of Dentistry. Established during the ascendancy of the commercial era in dental education, and conducted in intimate association with a dental supply-house,

¹ From 1918 to 1925, inclusive, the total attendance at the School of Pharmacy has been 32, 36, 43, 51, 62, 45, and 50, for the respective academic years. The number of graduates has ranged between 11 (1920-21) and 2 (1923-24); none in 1921-22 and 1922-23; in 1925 there were 3.

² Since 1922, seniors have been permitted to begin the work of the academic year on June 1, and, by continuing clinical and other courses throughout the summer, to graduate late in March. In this way the School has been providing instruction for two senior classes. The number of seniors who elected to begin the work in June was 70 in 1922; 27 in 1923; 44 in 1924; and 45 in 1925.

³ Combined curricula leading to the degrees of B.S. (four years) and D.M.D. (five years) will be offered, beginning in 1926-27. The College has been empowered by its new charter to grant the B.S. degree and other academic degrees.

this School for about a quarter of a century was one of the most successful business enterprises in dentistry. The former owner of the School has stated that all of the profit derived from the management of the School, and also some of the earnings of the supply house, were reinvested in the College. The general debt to be paid by the non-proprietary administration that was inaugurated in 1924, originally more than \$200,000, represents a portion of the former owner's accumulated profits. In order to remove this heavy debt, and also to meet the corresponding interest charges, the School, which lacks affiliation with an academic college or a medical school and has no endowment, must be conducted in such a way that large profits will be regularly derived from the fees paid by students and patients. During the four years 1920-24, before the reincorporation, the annual payments on account of debt (for interest) ranged between \$2240 and \$2715. In 1924-25 the payment on this account was \$19,768—\$7000 for reduction in the amount of the principal, and \$12,768 for interest. In 1924-25, fifty-three teachers—fourteen on whole-time service—received salaries amounting to a total of only \$74,631, which is insufficient, particularly at an independent school, to attract and retain teachers of the character and ability needed to give Class A instruction to dental students. Under such conditions it is not surprising that the work in the academic and medico-dental sciences, and in their integration with clinical dentistry and oral medicine, has been weak and that research has not received serious attention. The School's Infirmary is one of the best equipped in North America for conventional clinical dentistry, and the mechanical aspects of reparative dentistry are taught in detail. The recent addition of a diagnostic medical clinic, with associated laboratories equipped for clinical work, will improve the instruction in some of the correlations between clinical medicine and clinical dentistry, but this arrangement cannot be expected to present advantages that might be gained from close association with a good hospital or dispensary. The lengthening of the four-year curriculum to a five-year combination of academic and dental curricula beginning in 1926-27, the prospective admission to the second year of students who have completed one year of approved work in an accredited academic college, and the active effort now in progress to raise the scholastic level of the School, are prophetic of decided betterment. But students who desire to obtain the benefits of instruction in an academic college will not seek it in a professional school.

The unsatisfactory character of much of the recent work of this School, which has been widely known, should have made it impossible for the Dental Educational Council to give the School a Class A rating in 1924, after grading it Class B in 1923. This is particularly true because the Council ascribes much importance to the results of the annual license examinations, in which the graduates of this School have had a consistently low record, the percentage of failures for 1924 and 1925 having been 33.1 and 37.1, respectively. In each of these two years only one school in the United States made a poorer showing. The cumulative percentage of the graduates of this School who failed from 1910 to 1925, inclusive, is 22.1 for license examinations in thirteen states. One of the Dental Educational Council's standing minimum requirements for a Class A rating reads as follows: "If for more than two consecutive years the combined record of failures before state boards of the gradu-

CLASSIFICATION OF THE TOTAL ATTENDANCE OF DENTAL STUDENTS AT NORTH PACIFIC COLLEGE OF OREGON: 1922-26

	Percentage resident in Oregon	First year	Second year	Third year	Fourth year	Total	Graduates ¹
1922-23	34	135	163	156	169	623	162
1923-24	33	88 ²	120	158	148	514	144
1924-25	41	95 ³	99 ²	109	165	468	148
1925-26	33	94	89 ³	85 ²	126	394	...

¹ See footnote 2 on page 511.

² The first group admitted after the announcement of the Class B rating in 1923.

³ The first group affected by the restoration of the Class A rating in 1924.

ates of any school shall exceed 20 per cent in each year, on reports approved by the Dental Educational Council of America, the school shall not be considered acceptable." The table on page 512 presents data relating to the total attendance and its classification.¹

GENERAL COMMENT

Of the four adjacent states, California supports three dental schools. Washington, Idaho, and Nevada contain none, which is also true of British Columbia, Montana, Wyoming, and Utah. The North Pacific College of Oregon receives nearly all of its students from this wide northwestern region, where it has been obliged to compete with only four dental schools — three in California and one in Colorado. In 1924-25, the Portland School received only six students from these two states. The geographical distribution of the students, in 1924-25, is shown in the accompanying table, where it may be seen that approximately two-thirds of the number were drawn from sources outside of Oregon, chiefly from the State of Washington. The School has a larger number of Canadians among its students, particularly British Columbians, than any other dental school in the United States.

The Medical School of the University of Oregon, in its Announcement for 1925-26, appropriately refers to itself as the "sole school of medicine in the Pacific Northwest, reaching the largest territory in the United States served exclusively by one medical school." It merits generous support from the public it serves. Its obligation to include education in oral health-service is obviously commensurate with the extent of this wide region. At present, however, the only formal instruction the medical students receive in dentistry is a required course of seven lectures in the senior year on oral hygiene and oral pathology, which, unlike the conditions at most schools of medicine, indicates an initial effort to give to clinical dentistry its due share of attention. The establishment of a dental school by the University of Oregon in intimate association with the Medical School would greatly advance dental education and oral health-service in the Pacific Northwest. On a number of occasions, representatives of the North Pacific College have indicated a desire for affiliation or union with the University of Oregon, but probably the University has found that it could not be advantageously effected in expensive property situated at an undesirable distance from the medical buildings (nearly three miles).

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT NORTH PACIFIC COLLEGE OF
 OREGON: 1924-25

<i>States (17), territories (2), and foreign countries (4)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Canada	12	12	18	19	61
Idaho	6	3	5	5	19
Montana	3	4	7	6	20
Oregon	26	39	33	49	147
Utah	2	3	3	1	9
Washington	40	33	37	72	182
Alaska, China, Colorado, Hawaiian Islands, India, Iowa, Japan, Kansas, Louisiana, Michigan, New Hampshire, Pennsylvania, South Dakota, Wisconsin — one or two each	4	1	5	9	19
California, Minnesota, North Dakota — three or four each	2	4	1	4	11
Total	95	99	109	165	468

¹ The President of the College has stated that 1922-23 was the "last year during which Federal students were admitted," and that since and including 1923-24 "the first-year class has annually been limited to a maximum of 100 students." The Announcements for these years do not contain a statement of this policy.

PENNSYLVANIA

Population: 9,263,317. Number of dentists, 5037; physicians, 11,140. Ratios: dentists to population, 1:1839; physicians to population, 1:832; dentists to physicians, 1:2.2

Statutory requirements. *Dentistry*.—Preliminary education: one year of approved work in an academic college accredited by the Superintendent of Public Instruction. Professional training: graduation from a recognized educational institution having a four-year curriculum in dentistry. *Medicine*.—Preliminary education: one year of approved work in an accredited academic college. Professional training: completion of a four-year curriculum of not less than 32 weeks of at least 35 hours, graduation from a reputable and legally incorporated medical school, and one year of interne service in an approved hospital

Location of the dental schools (3): Philadelphia (2), and Pittsburgh; medical schools (6): Philadelphia (5), and Pittsburgh

PHILADELPHIA

Population: 1,965,220. Number of dentists, 1541; physicians, 3502. Ratios: dentists to population, 1:1275; physicians to population, 1:561; dentists to physicians, 1:2.3
Number of dental clinics or infirmaries, 35; hospitals, sanatoriums, and charitable institutions, 113; hospitals approved for internships, 26

Dental Schools: (1) Thomas W. Evans Museum and Dental Institute-School of Dentistry, University of Pennsylvania; (2) Temple University. *Medical Schools* (5): Hahnemann Medical College and Hospital; Jefferson Medical College of Philadelphia, University of Pennsylvania, Woman's Medical College of Pennsylvania, and Temple University

(1) THOMAS W. EVANS MUSEUM AND DENTAL INSTITUTE; SCHOOL OF DENTISTRY, UNIVERSITY OF PENNSYLVANIA

Location: Fortieth and Spruce Streets; one mile from the centre of the city

General character: educationally an integral part of the University of Pennsylvania; conducted in affiliation with the Thomas W. Evans Museum and Institute Society

Organized: in 1878. Absorbed, in 1909, the Pennsylvania College of Dental Surgery (1856-1909), which was the successor of the "first" Philadelphia College of Dental Surgery (1852-56). Absorbed, in 1916, the Dental Department of the Medico-Chirurgical College (1897-1916). The present affiliation with the Thomas W. Evans Museum and Institute Society (incorporated in 1899) was inaugurated, by agreement, in 1912

Conducted, under the terms of an agreement with the non-proprietary Thomas W. Evans Museum and Institute Society, by concurrent action of the Boards of Trustees of the Society and University. Under the conditions of this "affiliation or alliance," the Institute and School function as one educationally, on the property and with the sanction of the Society; and as a coördinate part of the University, with the consent of the latter. The Society's invested funds and property serve as the equivalent of a special endowment for dental education at, and under the auspices of, the University. Title to all the property of the School is vested in the Thomas W. Evans Museum and Institute Society, an independent, educational corporation (Pennsylvania, 1899). All of the School's income is paid to the Society. "All disbursements for the conduct of said dental school and museum" are made subject to the approval of the Board of Trustees of

the Society, four of whom, in a total of thirteen, must be elected and five of whom may be elected from among the Trustees of the University. All salaries, and matters of control in general, are determined by the *concurrent action* of the independent Boards of Trustees of the Society and the University, chiefly on the initiative of the former. Under the terms of the agreement with the Society, financial deficits are obligations of the University. The University receives compensation from the Society for the instruction given and the privileges accorded the dental students by the former. On this relationship, the agreement between the Society and University reads, in part, as follows: "The University of Pennsylvania shall furnish instruction to the dental students" in certain subjects, "and shall be compensated therefor upon the basis of the actual cost per student hour for said instruction given, and it shall also give, provide and furnish all privileges and relationships now (1912) enjoyed by the students of its own dental school in common with students of all other schools and departments of the University; and it shall be compensated therefor in the ratio which the total income from tuition fees of the whole number of students, of the Institute, bears to the income from tuition fees from the total body of students of the University. . . . In estimating the total cost of such privileges for which the University shall receive compensation there shall be included the necessary University expenditures of a general character incurred by the University for the general benefit of its whole student body, and which, therefore, cannot be charged to any particular department. Expenses incurred for light, heat, power, telephone service, and water rents or taxes of any kind are not to be included in the category of general University expenses to be prorated under this agreement"

Building: erected in 1915; total floor area, 62,103 sq. ft. Distance from the main site of the University, four blocks; from the medical buildings, four blocks

Infirmary: in the dental building, with six accessory rooms; total floor area, 15,556 sq. ft. Total number of chairs in active use, 201, including groups reserved for special purposes: prosthodontia, 41; crown and bridge work, 15; extraction, 4; orthodontia, 4; oral surgery, 3

Relation of the School of Medicine (Class A): instruction in anatomy, chemistry, histology, pathology, and physiology, is given to the dental students in separate classes, in the medical laboratories, by members of the Medical Faculty. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospitals in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: Philadelphia General Hospital (five blocks), Polyclinic Hospital (one mile), and St. Agnes Hospital (three miles)

Clinical facilities in the Hospitals where dental students received instruction in 1924-25: complete for oral surgery

Number of dental internships (1) and externships (5), held by students of the School, in the Hospitals in 1924-25: six

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: clinics in oral surgery; to teach oral surgery under the conditions that prevail in good hospitals

Library: room, 1953 sq. ft.; whole-time librarian. Contains 6300 bound and 1050 unbound volumes, and 1000 pamphlets (all effectively card indexed). Of the volumes, approximately 90 per cent relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: University Library and the section of it in the Medical School (four blocks each); Library of the College of Physicians of Philadelphia (thirteen blocks)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: nineteen students; total amount, \$4867, of which \$4313 was provided by the School Dean: whole-time officer; also Professor of Prosthetic Dentistry. Associate Dean (or equivalent officer): none. Dean's executive assistant: whole-time secretary

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: two years of approved work in an accredited academic college, beginning in September, 1927

Number of graduates (1879-1925): 5149; average per year, for forty-seven years, 110. (Number for the Pennsylvania College of Dental Surgery, 1857-1909—2743; average per year, for fifty-three years, 52. Number for the Dental Department of the Medico-Chirurgical College, 1898-1916—531; average per year, for nineteen years, 28)¹

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 642 (including special and graduate students); proportion from Pennsylvania: 1922-23—37 per cent; 1923-24—28 per cent; 1924-25—25 per cent. (Since September, 1925, the number of students admissible to the first-year class has been limited to 180)

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—12,508; 1921-22—10,344; 1922-23—14,439; 1923-24—19,378; 1924-25—16,099

Number of visits, sittings, or operations: 1920-25—no available data

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-23—no affiliations; 1923-25—no available data

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$786,432, and equipment, \$274,799; total, \$1,061,231 (December 31, 1925). The property is owned by the Thomas W. Evans Museum and Institute Society

General debt on the School (June 30, 1925): none

Amount of accumulated net assets of the Thomas W. Evans Museum and Institute Society (December 31, 1925): \$1,897,793

Principal amount of the Endowment Fund of the Thomas W. Evans Museum and Institute Society (December 31, 1925): \$500,000

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ²				
Fees (all kinds) paid by the students	\$165,385	\$138,012	\$156,954	\$148,633
Fees paid by patients, in all clinical departments	33,581	42,761	51,028	54,342
Interest on endowment	25,000	35,000	34,800	38,664
Miscellaneous receipts	4,287	3,602	2,020	2,172
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	None	None
<i>Carried forward</i>	<u>\$228,253</u>	<u>\$219,375</u>	<u>\$244,802</u>	<u>\$243,811</u>

¹ The number of graduates of the first Philadelphia College of Dental Surgery, which was discontinued in 1856 after its Faculty organized the Pennsylvania College of Dental Surgery, was 63 (1853-56), an annual average of 16.

² During the academic years 1920-24, there was no appropriation by the State or City, and no gift of funds; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

PENNSYLVANIA : PHILADELPHIA

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	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income, brought forward</i> ¹	\$228,253	\$219,375	\$244,802	\$243,811
(b) Estimated amount of miscellaneous income available to the School as a coordinate part of the University, but not specified in the dental budget	None	None	None	None
Total amount of current income	\$228,253	\$219,375	\$244,802	\$243,811
<i>Total amount of current expenditures</i>	\$235,061	\$224,406	\$259,703	\$232,602
Deficit	6,808	5,031	14,901	...
Surplus, all of which was paid into the "betterment and reserve fund" of the Thomas W. Evans Museum and Institute Society	...	...	...	11,209
Amount of the accumulated "betterment and reserve fund"	Not yet defined		130,000	150,277
Amount expended for the School by the University, in excess of dental income, and included in "University funds" above	None	None	None	None
Amount paid to the University, for all phases of cooperation, as per agreement with the Thomas W. Evans Museum and Institute Society ²	65,902	42,288	48,378	47,874
Average amount expended by the School per student (D.D.S.) per year	326	375	430	439
Average amount of all student fees paid to the School per student (D.D.S.) per year	230	231	260	280
<i>Details of expenditures:</i> ³				
For repairs	5,854	6,025	7,701	5,725
For new equipment	4,327	8,535	7,768	2,450
For research ⁴	1,500	1,750	1,600	2,000
For improvement of the library	315	174	251	400
For supplies used in the clinical departments	16,509	15,548	18,232	17,893
For salaries: for administration	30,845	31,153	31,666	31,327
For salaries: for teaching	123,884	118,663	122,735	115,957
For all other purposes ⁵	51,827	42,558	69,750	56,850
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(64)	(69)	(67)	(56)
Amount of their salaries as teachers	101,550	105,946	111,423	99,743
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	6,000	6,000	6,000	6,000
Smallest salary paid to a whole-time teacher of a dental subject	2,500	2,500	2,500	2,500
(Number of teachers of academic or medico-dental subjects)	(23)	(21)	(27)	(25)
Amount of their salaries as teachers	22,334	12,717	11,312	16,214

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no gift of funds; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² Includes the cost of instruction of dental students in the Medical School, and a proportionate share of the general operating expenses of the University.

³ During the academic years 1920-24, there was no payment on account of debt, rent, new construction, or land.

⁴ Estimates; includes the annual income (\$600) of the Pennsylvania College of Dental Surgery Fund, administered by the Trustees of the University.

⁵ The totals "For all other purposes," include some of the items that constitute the "Amount paid to the University," etc., above.

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on June 30				
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	\$4,500	\$4,500	\$4,500	\$4,500
In the Medical School	6,600	6,600	6,600	8,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	2,400	2,400	2,400	2,400
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget	None	None	None	None

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 77. Of this total number, 9 were whole-time, 1 was a half-time, and 12 were part-time or occasional teachers of academic or medico-dental subjects; 8 were whole-time, 34 half-time, and 13 part-time or occasional teachers of dental subjects; 9 were whole-time teachers in the Dental School only; 13 were "full" professors; 10 were assistant professors; 5 were lecturers by title; all received salaries; 38 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.A. and D.D.S.: since 1919; now seven years in length

Course for dental hygienists: since 1921; attendance: 1921-22—9; 1922-23—26; 1923-24—36; 1924-25—33

Advanced courses for dental practitioners: since 1910; attendance: 1921-22—9; 1922-23—10; 1923-24—3; 1924-25—11

Summer courses in clinical dentistry (July and August): since 1916; attendance: 1922—109; 1923—147; 1924—44; 1925—44

No course for dental mechanics, assistants, or technicians; no graduate course in dentistry; no dental extension teaching

Research: actively in progress in 1924-25, on *lingua nigra*; etiology of "pyorrhea alveolaris"; effect of metallic salts on the structure of enamel; further researches on the diseases of the dental pulp; histology of human cementum; oral bacteriology of the cat; technical improvements in the surgery of cleft palate; a new type of interdental splint for fractures of the mandible; bacteriology of suppurative osteitis of the jaws; correct angulation for roentgenography of the temporomandibular articulation; hereditary factor in malocclusion; tissue changes associated with orthodontic tooth movements; differences in electrical potential of healthy and diseased dental tissues and cavity fillings; care of the tooth-brush; relative frequency of occurrence of the several streptococcal types in periapical infections; sterilization of dental instruments; hereditary factor in dental caries; root formation of the molars of albino rats; phagocytosis in "pyorrhea" pockets; blood picture of Vincent's stomatitis; effect of streptococcal ("hemolytic" and "viridans") periapical infections on the blood picture; the "pathogen-selective" method applied to periapical infection; several papers were published in 1924 and 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service, but for many years an informal bureau, to coordinate graduates and opportunities, has been conducted by the Secretary, who receives many applications for help from practitioners and communities. Probably one-

STUDENTS AND GRADUATES: THOMAS W. EVANS MUSEUM AND DENTAL INSTITUTE;
SCHOOL OF DENTISTRY, UNIVERSITY OF PENNSYLVANIA

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	547	546	735	623	649	584
Women.....	13	10	12	12	10	13
From other countries; chiefly from Europe and South America.....	26	50	65	55	62	51
Negroes.....	4	8	12	13	15	13
Attendance at the end of the year.....	544	540	720	598	604	530
Admitted after examination.....	3	0	0	0	0	0
Admitted to advanced standing.....	3	29	25	21	28	20
From other countries, to advanced standing.....	3	27	18	16	22	18
"Repeaters" of one or more subjects.....	13	29	22	16	24	20
Denied further instruction because of deficient scholarship.....	11	36	19	19	11	6
GRADUATES (D.D.S.)						
Total number of graduates.....	243	42	141	108	198	229
Women.....	7	3	1	4	2	3
Admitted to practice in other countries.....	6	25	23	17	25	19
Negroes.....	1	0	2	0	4	1
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	11	3	7	5	8	9
Percentages of failures in such state-board examinations.....	31.2	38.5	11.2	22.1	17.4	17.2

half to one-third of the members of the senior class are annually assisted in this way in their selection of the communities in which to begin the practice of dentistry

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: January, 1922; June, 1924

The foregoing data have been verified in detail by the Dean

SUMMARY

This is the only dental school that has a relatively large independent financial foundation. It is housed in an ornate building, closely associated with a medical school, affiliated with one of the leading universities, situated in an old centre of dental activity and progress, and favored by conditions that have helped to make it one of the best and to give it an international reputation for excellence. The School, although for many years one of the most influential and having unusual resources, has not been responsive to its exceptional opportunity to take the lead in promoting graduate work in dentistry. It has actively encouraged the admission of undergraduates from countries other than the United States and has usually had the largest total attendance of foreign students, but the number has declined from 65 in 1920-21 to 26 at present (1925-26), following enforcement since 1921 of an admission requirement of one year of approved work in an accredited academic college. The School has a good equipment in general, including a valuable museum and one of the best dental libraries, and is active in research. For cooperating with the Thomas W. Evans Museum and Institute Society, which controls the School, the University receives a larger sum annually than the income from the School's endowment, the affiliation being profitable for the University. In 1923-24, 56 teachers of dental subjects, 8 giving whole-time service, were paid \$99,743; in 1924-25, the total for 55 of these teachers, 8 on whole-time duty, was \$105,826. The difference between the maximum whole-time salaries in the Medical and Dental Schools is large. A more liberal financial attitude would probably encourage the School not only to improve all of its undergraduate work, especially the instruction in the correlations between clinical medicine and clinical dentistry, but also to develop graduate

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF

PENNSYLVANIA: 1924-25

<i>States (21), territory (1), and foreign countries (16)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Connecticut	7	2	2	0	11
Delaware	2	1	0	2	5
New Jersey	52	38	34	7	131
New York	52	36	23	19	130
Pennsylvania	29	28	30	25	112
Porto Rico	0	4	0	0	4
Virginia	1	2	1	2	6
Alabama, Australia, Canada, Czechoslovakia, Finland, France, Germany, Hungary, Illinois, Indiana, Japan, Maine, Maryland, Montana, North Carolina, Panama, Persia, South Africa, Switzerland, Tennessee, Texas, Ukraine, Washington, Wisconsin — one each	3	6	2	13	24
China, England, Holland, Massachusetts, Ohio, Utah, West Virginia — two or three each	2	5	3	7	17
Total	148	122	95	75	440

courses and to endeavor to place the specialties of oral health-service on a sound educational basis.

The accompanying data for the geographical distribution of the students, in 1924-25, show that nearly two-thirds of the total number were drawn from New York and New Jersey, and that the absolute number from each of these states, in the successive classes, has been steadily increasing while that from Pennsylvania has remained stationary. In the Medical School, by contrast, the students from these two states constituted only about one-tenth of the total attendance. The general significance of these facts is discussed on page 533. Comparative data relating to students and graduates are given on page 535; to the results of license examinations, on page 537.

The fate of the graduates of this School in the state-board examinations, during the past sixteen years (1910-25), presents a striking anomaly, an average of 19.3 per cent of the number having failed to pass at the first attempts. Only one other university school now rated Class A has a record of more failures during this period. These facts seem to imply either that the School is highly overrated by the Dental Educational Council, or that it has been a victim of some of the conditions discussed on page 532 that tend to render the results of state-board examinations, as at present obtained, unreliable as criteria of the educational quality of a school.¹

The curriculum of the School of Medicine does not include any aspect of oral health-service, although the common medical specialties are taught to undergraduates. The Professor of Clinical Maxillofacial Surgery and Surgical Pathology, in the Dental School, is Professor of Maxillofacial Surgery in the Graduate School of Medicine. As a member of the Department of Surgery, in this Graduate School, he conducts, at the Polyclinic and Medico-Chirurgical Hospitals, advanced work in maxillofacial surgery, including injury and diseases of the jaw, harelip, cleft palate, plastic operations on the face, reconstruction of lips and nose, etc. None of the teachers of dental subjects is a member of the undergraduate Medical Faculty. There are no dentists in the Faculty of the School of Hygiene and Public Health.

¹ An illustration of anomalous conditions affecting license examinations, and relating to this School, may be cited. In 1920, only two of about thirty graduates passed the license examination in New Jersey at their first trial, but nearly all of them passed their initial license examinations in New York or Pennsylvania.

(2) SCHOOL OF DENTISTRY, TEMPLE UNIVERSITY

Location: Eighteenth and Buttonwood Streets; one-half mile from the centre of the city

General character: integral part of Temple University

Organized: in 1907, by absorption of the affiliated (second) Philadelphia Dental College (1863-1907). A separate Board of Trustees served in an honorary relation from 1907 to 1909

Building (occupied by the Schools of Medicine, Dentistry, Pharmacy, and Chiropody): erected in 1897, for the Philadelphia Dental College; total floor area used for the instruction of dental students, 42,000 sq. ft. Distance from the main site of the University, one mile

Infirmery: in the dental building, with three accessory rooms; total floor area, 18,000 sq. ft. Total number of chairs in active use, 84, including groups reserved for special purposes: oral hygiene, 10; children's clinic, crown and bridge work, and orthodontia, 8 each; prosthodontia, 6; extraction, 2; roentgenography, 1

Relation of the School of Medicine (Class B): the medico-dental subjects are taught to dental students, in separate classes in the medical laboratories, by teachers who are not members of the Medical Faculty. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; one teacher of a dental subject gave medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction in 1924-25: Garretson Hospital (adjacent)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for oral surgery

Number of dental internships (2) and externships (2), held by officers (2) and students (2) of the School, in the Hospital in 1924-25: four

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: clinics in oral surgery; to teach oral surgery under the conditions that prevail in a good hospital

Library (primarily medical): room, 800 sq. ft.; whole-time librarian. Contains 3870 bound and 55 unbound volumes, and 1939 pamphlets (not effectively card indexed). Of the volumes, approximately 228 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: University Library (one mile)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: thirty students; total amount, \$4470, all of which was provided by the University in scholarships

Dean: part-time officer; also Professor of Dental Anatomy, Dental Histology, and Embryology. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: whole-time secretary

Minimum academic requirement for admission to the first-year class, in September, 1924: completion of a four-year high-school course or its equivalent (since 1914)

Latest advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1925

Number of graduates (1908-25): 890; average per year, for eighteen years, 49. (Number for the Philadelphia Dental College, 1864-1907 — 3116; average per year, for forty-four years, 71)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25):

266; proportion from Pennsylvania: 1922-23—85 per cent; 1923-24—91 per cent; 1924-25—76 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—2224; 1921-22—2708; 1922-23—3205; 1923-24—3261; 1924-25—4641

Number of visits: 1920-21—6781; 1921-22—5293; 1922-23—8374; 1923-24—8242; 1924-25—10,641

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-25—none

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value of land and building, \$75,000, and equipment, \$128,987, used by the School; total, \$203,987 (June 30, 1925). Value of the equipment used by the Dental School exclusively, \$65,000

General debt on the Dental School, payable to the University (December 31, 1925): \$147,100 at 6 per cent interest per annum

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$33,829	\$52,715	\$72,113	\$95,773
Fees paid by patients, in all clinical departments	5,919	9,942	14,183	16,025
Miscellaneous receipts	2,392	3,290	4,415	4,738
University funds, additional to the income designated above:				
(a) Direct appropriation	7,548	None	None	None
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	None	None	None	None
Total amount of current income	\$49,688	\$65,947	\$90,711	\$116,536
<i>Total amount of current expenditures</i>	\$49,688	\$63,320	\$87,005	\$98,345
Surplus for the year, paid to the University	None	2,627	3,706	18,191
Amount expended for the School by the University in excess of dental income, and included in "University funds," above	7,548	None	None	None
Average amount expended by the School per student (D.D.S.) per year	245	208	227	196
Average amount of all student fees paid to the School per student (D.D.S.) per year	167	173	188	190
<i>Details of expenditures:</i>				
For reduction in principal of debt	None	None	None	None
For interest on debt (paid to the University)	2,595	8,484	8,597	8,060
For rent	None	None	1,250 ²	1,500 ²
For repairs	740	3,401	6,279	4,325
For new equipment	1,000	2,500	8,191	4,122

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² Rent was paid for the temporary use, for teaching purposes, of several rooms in a building across the street.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
For new construction (no land)	\$2,000	\$3,000	\$8,276	None
For research	None	None	None	None
For improvement of the library	None	None	1,256	\$1,338
For supplies used in the clinical departments	3,136	3,753	7,005	6,258
For salaries: for administration	4,500	4,318	4,504	4,700
For salaries: for teaching	26,695	33,221	39,804	44,991
For all other purposes	9,022	4,643	1,843	23,051

Salaries for instruction:

(Number of teachers of dental subjects)	(17)	(19)	(23)	(37)
Amount of their salaries as teachers	22,100	23,700	29,500	31,891
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	2,000	2,500	3,000	3,500
Smallest salary paid to a whole-time teacher of a dental subject	1,200	1,200	1,500	1,500
(Number of teachers of academic or medico-dental subjects)	(9)	(11)	(11)	(13)
Amount of their salaries as teachers	4,595	9,521	10,304	13,100
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	2,000	2,500	3,000	3,500
In the Medical School	3,500	3,800	4,000	4,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	2,000	2,500	3,000	3,000

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 49. Of this total number, 2 were whole-time, 4 half-time, and 4 part-time or occasional teachers of academic or medico-dental subjects; 5 were whole-time, 13 half-time, and 21 part-time or occasional teachers of dental subjects; 5 were whole-time teachers in the Dental School only; 13 were "full" professors; 5 were associate or assistant professors; 3 were lecturers by title; all received salaries; 11 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Course for dental hygienists: since 1921; attendance: 1921-22—1; 1922-23—3; 1923-24—11; 1924-25—9

No combined curricula leading to the degrees of B.S. or B.A. and D.D.S.;¹ no course for dental mechanics, assistants, or technicians; no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research: none in progress in 1924-25; no publication in 1924, one in 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

¹"Prospective graduates in dentistry who also contemplate reading medicine may, at their option, complete both courses in six consecutive years by matriculating two years in the Dental School and four years in the Medical School. The student is required to meet the entrance requirements for the School of Medicine [two years of approved work in an accredited academic college after completion of four years of work in an accredited high school]. The branches of study common to both courses are credited in the higher course to the extent in which they were passed in the lower." — *Temple University Bulletin*, 1925, No. 8, p. 15. The Dean of the Dental School has stated that this official announcement was not made by agreement with the Dental Faculty and that the plan has never been in operation.

DENTAL SCHOOLS IN THE UNITED STATES

STUDENTS AND GRADUATES: SCHOOL OF DENTISTRY, TEMPLE UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	118	163	222	307	385	507
Women.....	4	4	6	6	3	7
From other countries; chiefly from Central and South America.....	4	3	7	6	9	11
Negroes.....	6	5	7	9	11	10
Attendance at the end of the year.....	113	159	203	305	383	503
Admitted after examination.....	4	8	10	27	12	14
Admitted to advanced standing.....	8	11	2	7	0	0
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	4	7	6	11	12	16
Denied further instruction because of deficient scholarship.....	2	0	3	4	3	6
GRADUATES (D.D.S.)						
Total number of graduates.....	47	18	22	29	65	62
Women.....	2	2	3	2	3	3
Admitted to practice in other countries.....	6	1	0	3	4	2
Negroes.....	3	2	4	5	3	2
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	4	4	2	2	7	4
Percentages of failures in such state-board examinations.....	15.3	30.8	10.0	7.4	4.6	9.7

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: January, 1922; June, 1925

The foregoing data have been verified in detail by the Dean

SUMMARY

THIS School was the first to include oral surgery in its curriculum. This innovation was introduced about sixty years ago by a former Dean of the School who brought about the establishment of Garretson Hospital, which, named in his honor, was the first to be devoted to the surgical treatment of diseases and lesions of the mouth, teeth, and adjacent parts. The School does not use this Hospital or any of its facilities effectually for instruction in the correlations between clinical medicine and clinical dentistry. The School was also one of the first to offer formal instruction in anesthesia. No graduate courses are given, research is neglected, and the dental section of the union library is deficient. At present (December, 1925), of 80 medical schools in the United States, 70 are rated Class A, 3 Class B, 6 Class C; 1 is unclassified. Each of the Class B schools "needs general improvements to be made acceptable." Of all the medical schools in the United States that are related to dental schools, or jointly occupy buildings with them, the Temple Medical School is the only one that is not rated Class A. Although the Dental School shares occupancy of the building with the Medical School and with two other schools, it is not intimately associated with the Medical School, and conducts its instruction without the help of members of the Medical Faculty. Neither clinical dentistry nor stomatology is included in the medical curriculum, but lectures on oral surgery, in the course in surgery for seniors in medicine, are given by the Professor of Oral Surgery and Anesthesia in the Dental School, who, as Lecturer on Oral Surgery to medical students, is also a member of the Medical Faculty.

The Dental School is overcrowded and has been admitting a much larger number of students than it can effectually teach. In 1924-25, at the end of the year, there were 187 students in the first-year class, 568 students in the four classes, 47 teachers to give them instruction, and only 5 teachers on whole-time service. The amount expended on salaries for instruction was only \$54,758. In 1924-25 the number of Negroes increased to 24, and

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT TEMPLE UNIVERSITY: 1924-25

<i>States (12), territories (2), and foreign countries (2)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Connecticut	4	6	4	2	16
Delaware	1	3	0	0	4
Kentucky	0	2	0	0	2
New Jersey	29	30	14	22	95
New York	2	2	0	3	7
Pennsylvania	147	123	81	79	430
Alabama, Cuba, Hawaiian Islands, Honduras, Massachusetts, Michigan, North Carolina, Porto Rico, South Carolina, West Virginia—one each	4	2	0	4	10
Total	187	168	99	110	564

the number of students from foreign countries was 5. At present (December, 1925), the total attendance includes 25 Negroes, and 4 students from foreign countries. Besides being overcrowded with candidates for the D.D.S. degree, the School conducts a curriculum for dental hygienists, which is now attended by 12 students (December, 1925). In 1924-25, under these conditions, the School's net income — the profit for the University — was \$29,567; in 1923-24, on a smaller attendance the profit was \$18,191. Instead of using the surplus to pay off the heavy debt on the School, the University continues the debt and requires payment of 6 per cent interest from current income, which in 1923-24 was \$8060 and in 1924-25 was \$8584. Fortunately, the entrance requirement of one year of approved work in an accredited academic college, which became the legal minimum for admission to the license examination in Pennsylvania for students admitted in 1925-26 and thereafter, has reduced the number of students in the first-year class from 187 in 1924-25 to 53 at present (December, 1925). Unless the School provides much better facilities for all of its work, its largest classes cannot be given the quality of instruction to which they are entitled and which the interests of the prospective patients require. The Temple schools for health-service education cannot be materially improved without the expenditure of large special funds for the purpose. If these Schools were rebuilt on the main site of the University and generously supported financially, their usefulness to the state and city would be greatly enhanced.

In 1923-24, the total amount of the expenditures exceeded that of the fees paid by the students by only \$2572; in 1924-25, the amount of the fees paid by the students was \$8391 greater than the School's expenses. This School illustrates the way in which the fees paid by the students can be made to carry a school and the fees paid by patients in an infirmary can be made a profit of 100 per cent. That the School is disinclined to apply sincere standards of scholarship is suggested by the fact that of its 568 students in 1924-25 only four were denied further instruction because of deficient scholarship and only 12 were "repeaters" of one or more subjects. The accompanying data for the geographical distribution of the students, in 1924-25, indicate that most of the non-resident students came from New Jersey and Connecticut. Comparative data relating to students and graduates are given on page 535; to the results of license examinations, on page 537.

PITTSBURGH

Population: 678,788. Number of dentists, 634; physicians, 1226. Ratios: dentists to population, 1: 1071; physicians to population, 1: 554; dentists to physicians, 1: 1.9 Number of dental clinics or infirmaries, 57; hospitals, sanatoriums, and charitable institutions, 39; hospitals approved for internships, 13

Dental School: University of Pittsburgh. *Medical School*: University of Pittsburgh

SCHOOL OF DENTISTRY, UNIVERSITY OF PITTSBURGH

Location (clinical building): Thackeray and O'Hara Streets; two miles from the centre of the city

General character: integral part of the University of Pittsburgh

Organized: in 1905, by absorption of the previously affiliated Pittsburgh Dental College (1896-1905). At that time the name of the University was "Western University of Pennsylvania," which in 1908 was changed to University of Pittsburgh

Buildings: three. (a) The first of three buildings now occupied by the School was erected on the site of the University in 1912; special improvements have been made in it yearly since 1918; it is now used almost exclusively for the work of the first two years. (b) In 1920, the building of the Central Athletic Association, at the corner of Thackeray and O'Hara Streets, and adjacent to the University buildings, was adapted to the needs of the work of the third and fourth years, and is now used as the "Infirmiry Building." (c) In 1922, Arts Hall, on the site of the University, was refitted for occupancy by the School. It contains one large lecture room for the instruction of sophomores, juniors, and seniors; also three laboratories: prosthetic (180 freshmen, 60 sophomores), orthodontic, crown and bridge, and ceramic technology (juniors), crown and bridge technology (seniors). The floor area of each of the three buildings, in the order named above, is (a) 19,000 sq. ft., (b) 22,500 sq. ft., (c) 8000 sq. ft.; total, 49,500 sq. ft. These buildings, which are situated on or adjacent to the University campus, are located within a few hundred feet of one another, and of the buildings of the Medical School and of the Mellon Institute for Industrial Research¹

Infirmiry: in the "Infirmiry building," with seventeen accessory rooms; total floor area, 22,500 sq. ft. Total number of chairs in active use, 225, including groups reserved for special purposes: prosthodontia, 50; crown and bridge work, 30; children's clinic, clinical pathology, and orthodontia, 20 each; examination, exodontia, and roentgenography, 2 each

Relation of the School of Medicine (Class A): the Schools of Medicine and Dentistry conduct their work independently of each other, although some of the work in anatomy for dental students is done in the medical building. At the end of the year 1924-25, the total number of students in the School of Medicine was 223; in the School of Dentistry the number was 1038. In 1924-25, one teacher of a medical subject gave dental students instruction in clinical medicine; one teacher of a dental subject gave medical students instruction in clinical dentistry

Dispensaries and Hospitals in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: *Hospitals*.— Allegheny General (two);² Bellevue Suburban General (eight); Children's (one-fourth); Magee (one-fourth); Mercy (one-half); New Kensington Citizens (fifteen); Presbyterian (three); St. Francis (one); Western Pennsylvania, for Tuberculosis (one). *Homes and Asylums*.— Allegheny County Juvenile Court Detention Home (one-half); Concordia Home (twenty-five); Episcopal Church Home (one); Holy Family Orphanage (eleven); Home for the Friendless (two and one-half); Industrial Home for Crippled Children (three); Passionist Convent (two); Protestant Orphanage (three); St. Paul's Orphanage (ten); St. Rosalia Foundling Asylum (one). *Public Schools*.— Carnegie (ten); Homestead (four); Neville Island Public School (twelve); Oakmont (ten); Penn Township (four); Swissvale (four); Western Pennsylvania Institute for the Deaf and Dumb (four); Western Pennsylvania School for the Blind (one-eighth); Wilkinsburg (three). *Community Houses*.— Braddock Public Health

¹ During the past year (1924-25), the alumni, students, and Faculty subscribed \$375,000 to a special fund for the construction of a new building for the School of Dentistry. Of this amount, \$85,000 has already been paid (June 15, 1926). The subscriptions cover a five-year period of payment.

² The distances are indicated in terms of miles.

House Station (eight); Bryant Colored Community House (one); Leetsdale Community House (eighteen); Soho Community House (one-half); Sewickley Child's Health Association (fifteen); Tuberculosis League of Allegheny County, McKees Rocks Station (four); Tuberculosis League of Allegheny County, Moon Run Station (eight); Western Penitentiary (three). *Reform School*.—Pennsylvania Training School, Morganza (twenty). *Summer clinics*.—State Penitentiary, Rockview, Pennsylvania (one hundred and fifty); Pine Mountain Settlement School, Pine Mountain, Harlan County, Kentucky (five hundred)¹

Clinical facilities in the Dispensaries and Hospitals where dental students received instruction in 1924-25: one to three complete dental equipments in each of the institutions listed above; also complete surgical and medical facilities in each of the nine hospitals on the list

Number of dental internships (4) and externships (46), held by officers (4) and students (46) of the School, in the Dispensaries and Hospitals in 1924-25: fifty

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: all types of dental work are performed, except the more complicated varieties of prosthesis; oral surgery, general surgery, and medical consultation are taught at each of the nine hospitals

Library (in the Infirmary Building): room, 450 sq. ft. (stack room, 2400 cu. ft. in addition); whole-time librarian. Contains 5663 bound and 3000 unbound volumes, and 5600 pamphlets (all the volumes effectively card indexed). Of the volumes, approximately 90 per cent relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Libraries of the University and the School of Medicine, also the Carnegie Library (one-fourth mile); not in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: whole-time officer; also Professor of Operative Dentistry. *Vice-Dean*: whole-time officer; also Professor of Histology and Bacteriology

Minimum academic requirement for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (15 units), or its equivalent (since 1910)

Latest advance in the minimum academic requirement for admission: one year of approved work in an accredited academic college, for the year 1925-26

In September, 1925, the School began to reorganize its program of studies to combine a two-year curriculum in academic subjects, now in operation, with a three-year curriculum in professional work, leading to the B.S. degree at the end of the fourth year of the combined curricula, and D.D.S. at the end of the fifth year. The new professional curriculum will be inaugurated in 1926-27. Full-year graduate curricula, leading to the M.S. or Ph.D. degree, will be based on the new undergraduate curriculum. A Graduate Division of the School, recently created, will be a part of the Graduate School of the University

Number of graduates (1906-25): 1352; average per year, for twenty years, 68. (Number for the affiliated Pittsburgh Dental College, 1897-1905: 378; average per year, for nine years, 42)

¹In addition to providing needed dental service, the extra-mural clinics afford the students opportunity to gain valuable experience with a variety of patients, including unusual types, such as children of all ages, incorrigibles, criminals, invalids, and mental defectives; to become better acquainted with hospital and institutional practices, and with the effects of institutional life and regimen upon the teeth and oral tissues; and, from close contacts with the medical and surgical departments, to learn the procedures of consultation and collaboration in health service.

In the administration of this supplementary service, to prevent waste of time and effort and to coordinate it satisfactorily with the clinical work in the School's Infirmary, assignments to the "Dispensaries and Hospitals" are awarded only to students who demonstrate exceptional fitness. Several students are assigned to each clinic, but no student absents himself from the School's Infirmary for more than one day a week on this account. Special credit is given for the extra-mural work, which is supervised and controlled by the Faculty of the Dental School. The more distant clinics, such as those of the Pennsylvania State Penitentiary at Rockview, and the Pine Mountain School in Kentucky, are operated only during the summer.

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 533; proportion from Pennsylvania: 1922-23—90 per cent; 1923-24—90 per cent; 1924-25—86 per cent. (From Southeastern Ohio and Northern West Virginia, within 100 miles of Pittsburgh: 1922-23—6.3 per cent; 1923-24—6.5 per cent; 1924-25—6.5 per cent)

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—8104; 1921-22—12,103; 1922-23—16,316; 1923-24—17,502; 1924-25—20,899

Number of visits (sittings): 1920-21—21,611; 1921-22—32,275; 1922-23—43,509; 1923-24—46,672; 1924-25—61,065

Number of patients treated in the Dispensaries and Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-21—1738; 1921-22—2993; 1922-23—6271; 1923-24—8279; 1924-25—7802 (estimate)

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value (Dental School) of land and buildings, \$400,000, and equipment, \$140,000; total, \$540,000 (September 30, 1925)

General debt on the School, or carried by the University on the School's account (September 30, 1925): \$80,000 at 6 per cent interest per annum

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$112,603	\$151,948	\$177,375	\$200,000
Fees paid by patients, in all clinical departments	28,106	45,439	64,977	78,412
Interest on endowment	100	150	150	300
University funds, additional to the income designated above:				
(a) Direct appropriation ²	3,000	3,000	3,000	3,000
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	51,833	82,499	85,176	41,636
Total amount of current income	\$195,642	\$283,036	\$330,678	\$323,348
<i>Total amount of current expenditures</i>	\$195,642	\$283,036	\$330,678	\$323,348
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	51,833	82,500	85,176	41,636
Average amount expended by the School per student (D.D.S.) per year	403	444	442	382
Average amount of all student fees paid to the School per student (D.D.S.) per year	232	238	237	236
<i>Details of expenditures:</i>				
For reduction in principal of debt	None	None	None	10,000
For interest on debt	5,400	5,400	5,400	5,070
For rent	None	None	None	None

¹ During the academic years 1920-24, there was no appropriation by the State directly or by the City, and no current income by gift; no money was borrowed; and there were no miscellaneous receipts.

² An apportionment to the School from a general appropriation by the State to the University. It is used to support some of the free clinical service for indigent patients.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
For repairs				
For new equipment }	\$20,536	\$13,068	\$22,344	\$20,110
For new construction (no land)	28,009	8,624	23,367	None
For research	None	None	None	None
For improvement of the library	2,133	2,012	2,264	1,660
For supplies used in the clinical departments	10,091	19,289	27,674	32,349
For salaries : for administration	7,000	7,500	7,500	9,750
For salaries : for teaching	59,172	79,058	100,625	142,407
For all other purposes ¹	63,301	148,085	141,504	102,002

Salaries for instruction :

(Number of teachers of dental subjects)	(50)	(59)	(67)	(76)
Amount of their salaries as teachers	46,528	60,798	77,045	101,967
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	3,750	3,600	3,600	4,500
Smallest salary paid to a whole-time teacher of a dental subject	1,800	1,800	1,800	1,800
(Number of teachers of academic or medico-dental subjects)	(12)	(14)	(18)	(26)
Amount of their salaries as teachers	12,644	18,260	23,580	40,440
Largest salary paid to a whole-time teacher of an academic or medico-dental subject :				
In the Dental School	3,334	3,334	4,000	5,000
In the Medical School	7,000	7,000	7,000	7,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	2,400	2,400	2,400	2,400
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget	None	None	None	None

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 102. Of this total number, 8 were whole-time, 8 half-time, and 11 part-time or occasional teachers of academic or medico-dental subjects; 39 were whole-time, 18 half-time, and 18 part-time or occasional teachers of dental subjects; 9 taught both general types of subjects; 46 were whole-time teachers in the Dental School only; 11 were "full" professors; 10 were assistant professors; 3 were lecturers by title; all received salaries; 27 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1912; now seven years in length

Course for dental assistants: since 1925; attendance: 1925-26—12 (December)

*Advanced courses for dental practitioners:*² irregularly since 1917; attendance: 1921-24—no available data; 1924-25—39

¹ About one-half of the total "for all other purposes" is the School's proportionate share of the general administrative expenses of the University and included in "University funds," on page 528.

² Some of the advanced courses promote true graduate work and will be credited as such in prospective graduate curricula.

STUDENTS AND GRADUATES: SCHOOL OF DENTISTRY, UNIVERSITY OF PITTSBURGH

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	354	411	518	661	786	904
Women.....	8	6	8	9	8	11
From other countries; chiefly from Canada and Porto Rico.....	2	3	2	3	5	4
Negroes.....	3	7	10	16	22	22
Attendance at the end of the year.....	293	365 *	486	638	748	846
Admitted after examination.....	2	5	3	2	7	7
Admitted to advanced standing.....	2	12	19	5	1	7
From other countries; to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	7	23	11	17	20	27
Denied further instruction because of deficient scholarship.....	18	20	15	22	16	17
GRADUATES (D.D.S.)						
Total number of graduates.....	95	34	54	77	128	157
Women.....	2	2	1	3	1	2
Admitted to practice in other countries.....	0	1	0	1	0	0
Negroes.....	1	0	1	0	4	4
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	2	1	2	2	3	1
Percentages of failures in such state-board examinations.....	1.0	5.0	0	1.3	0.8	0

Summer courses in clinical dentistry (June and September): since 1897 (also July, since 1924); attendance: 1922—108; 1923—117; 1924—150; 1925—205

No course for dental mechanics, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no dental extension teaching

Research: actively in progress in 1924-25, on temporo-mandibular influences in prosthesis and deafness; dental embryology and bacteriology (for teaching purposes); root-canal therapy — to devise a reliable and practicable way of treating pulpless teeth, and determining results and changes in the apical region at various intervals; abrasive effects of dentifrices on tooth structures and gingival tissues (in conjunction with the Mellon Institute); vaccino-therapy in pyorrhea; characteristics of saliva in various types of people — to ascertain any existing relationship between the qualities of saliva and the incidence of dental caries (in conjunction with the Mellon Institute); effects of medicaments on the gingivae; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service, although the School coöperates freely in this way, whenever such assistance is requested

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research, but the School has maintained friendly contact with and interest in the welfare of its graduates wherever possible; and has endeavored, in a general way, to estimate the quality of its instruction by the achievements of the graduates, and by their cordial and helpful interest in the welfare of the School

Visited: March, 1922

The foregoing data have been verified in detail by the Dean

SUMMARY

In 1924-25, this School, with 1095 students at the beginning of the year and 1038 at the end, and with 403 in the first-year class at the opening of the year and 374 at the close, had not only the maximum attendance but also the largest single class in the history of

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF
PITTSBURGH: 1924-25

<i>States (17), territories (2), and foreign country (1)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Connecticut	3	0	0	1	4
New Jersey	11	1	0	4	16
New York	5	5	4	0	14
Ohio	30	6	8	11	55
Pennsylvania	327	232	207	176	942
West Virginia	16	9	7	5	37
Delaware, Georgia, Illinois, Maryland, North Carolina, Washington, Wyoming— <i>one each</i>	3	1	1	2	7
District of Columbia, Porto Rico, Wisconsin— <i>two each</i>	3	2	1	2	8
Alabama, Canada, Florida, Massachusetts— <i>three each</i>	5	5	1	1	12
Total	403	261	229	202	1,095

dental schools. Most of these students reside in western Pennsylvania. The accompanying data for the geographical distribution of the students, in 1924-25, indicate that the chief sources outside of Pennsylvania were Ohio and West Virginia, the number from each state having recently increased. For the instruction of this exceptional number of students, there were 102 teachers, of whom 46 gave whole-time service. In the same year the salaries for instruction amounted to \$178,958, the largest of which was \$5000; the expense of administration was only \$9750. The University paid \$8081 in excess of dental income to meet the School's expenses, which included \$4800 interest on the general debt. No other dental school has so many whole-time teachers.

The earnestness and courage of the Faculty in 1924-25, in accepting the overwhelming duty to give careful personal instruction to nearly eleven hundred students, deserve commendation, but this cannot be said of the judgment that admitted a larger number of students than a faculty of its size and experience could effectually teach in the buildings and with the equipment available, and under the limitations that obviously surround the School. Inasmuch as for some years about 85 per cent of the School's students have been residents of western Pennsylvania, the Faculty, aiming to provide for the many applicants from this region and expecting that a new and urgently needed building would soon be available, optimistically undertook an almost impossible task. In order to meet the obligations to the students that for three years will steadily mount in seriousness, the School must materially enlarge some of its teaching groups, greatly increase its facilities, and carefully guard its standards of individual scholarship and proficiency. For the attainment of these objectives it deserves the special cooperation of the University and of the related schools, and the financial consideration of the Pittsburgh community. The extent of the present predicament of the School in these important respects may be inferred from the data for the number of students in the different classes, given on page 532. Fortunately for the School's welfare, the enforcement of a requirement of at least one year of approved work in an accredited academic college, beginning in 1925-26, lowered the number of students in the present first-year class to 56 (December, 1925). This beginning of a return to a normal condition, and the adoption of the two-three-graduate plan, have opened a new era at Pittsburgh, in which the maintenance of high quality in the instruction will not be endangered by the future admission of an excessive number of students. The comment on page 323, on the undesirable consequences of overcrowding a dental school, might suitably be stated here.

This School, which has held a Class A rating since the Dental Educational Council first classified the dental schools, has also long enjoyed the reputation of being unusually practical. The large number of applicants for admission have been attracted to it, to a great

extent, by the favorable opinion in which the School is widely held among dental practitioners. This esteem, which is based primarily upon respect for the School's leading teachers, has seemed to derive important confirmation from the official reports of the results of state-board examinations, where it will be found that for the past sixteen years (1910-25) this School's cumulative record is superior to that of every other school in the United States — only 2.2 per cent of its graduates who took license examinations during these years failed to pass at their first attempts (26 of a total of 1200 in eleven states). This is an impressive and creditable result from every point of view, but it and all other exceptionally low records may suggest much more than the facts warrant. There is a growing tendency among graduates of dental schools to take the license examinations in the states where they obtain the professional degree, and it is currently believed by dental students that this procedure affords personal benefits. Dental schools do not discourage this tendency, but as a rule derive advantage from it, for the "state-board records" are based only on the initial attempts of graduates to pass license examinations—if they pass in the School's own state, where the board is usually not unfriendly, failures in their home states do not affect the record. The temptation of students to adapt themselves to these conditions was shown at this School in 1924 and 1925, when, although approximately 15 per cent of the number of its students were not Pennsylvanians, all of its graduates who applied for a license took the examinations in Pennsylvania, and every candidate in 1924 and all but one in 1925 passed at the first trial (1 failure in a total of 314 candidates during the two years). License examinations are "soft" in some states, "hard" in others. There are striking indications of partiality for the graduates of some schools, and prejudice against those of others. The self-respect and fidelity of state-boards should make these conditions impossible. The present unreliability of some of the results of state-board examinations as criteria of the educational qualities of a school was considered on page 109.

For years the School has been a leading exponent of the idea that a dental school can be conducted most satisfactorily in complete independence of a medical school. Its students have not had the advantages that flow from the close association of such schools in a common purpose generously to give the students of each the best possible instruction in the correlations of clinical medicine and clinical dentistry. The Dental School has made a virtue of necessity in its hospital relationships, which it has multiplied and extended

CLASSIFICATION OF THE DENTAL UNDERGRADUATES AT PITTSBURGH—THREE CURRICULA: 1925-26

Curriculum	Academic years		Professional years				Total
	First	Second	First	Second	Third	Fourth	
The "0-4 plan":							
Old students	...	...	..	352 ¹	238	242	832
Repeaters	...	...	20 ²	...	...	...	20
Temporary "1-4 plan"	...	...	36 ³	...	...	...	36
New "two-three-graduate plan"	153 ⁴	None ⁵	..	...	...⁶	... ⁶	153 ⁴
Total	153	None	56	352	238	242	1,041 ⁷

¹ The last first-year class on the "0-4 plan" was admitted in 1924.

² The "repeaters" will be given an opportunity to complete the professional training with the first students admitted in 1925-26 on the temporary "1-4 plan." See footnote 3.

³ The first students on the temporary "1-4 plan" were admitted in 1925. The only students to be admitted on this plan after 1925-26 will be such as may qualify for advanced standing.

⁴ Now primarily registered in the Academic College of the University of Pittsburgh.

⁵ In 1926-27 qualified students from other academic colleges will be admissible to the second academic year and to the first year of the three-year professional curriculum; and the usual rules affecting admission to advanced standing will apply to each of the professional years on all of the plans.

⁶ On this five-year, integrated, academic-professional program, eligible students will receive the degree of B.S. at the end of the fourth year and D.D.S. at the end of the fifth year. At the conclusion of succeeding optional graduate years, successful students will receive commensurate advanced degrees.

⁷ This total includes 153 students who are primarily registered in the Academic College (December, 1925).

under conditions of control and regulation that give the School exceptional opportunity for public service, and also afford unusual practical experience for its best students. Expansion of the School's extra-mural clinical facilities is one of the indicated ways of meeting in part its obligations to successively larger classes during the next three years. The overcrowded condition of the School has made it impossible for the Faculty to do much more in the way of instruction than to concentrate on the undergraduate curriculum. The library is steadily growing in size and usefulness. There were no special expenditures for research during the four years indicated in the foregoing financial statement, but in 1924-25 a fund of \$1000 was devoted to the subjects specified on page 530, some of which were studied in collaboration with workers in the Mellon Institute for Industrial Research. The policy of the School having been sympathetic toward the Negro, nineteen colored students are now in attendance. Through the University's association with the adjacent Carnegie Institute of Technology, the School will have exceptional opportunities to promote instruction in esthetics, during both the pre-professional period and also in its applications to prosthetics (page 131).

In harmony with the facts stated on page 536 regarding the admissibility of graduates of a two-three curriculum to the license examination in Pennsylvania, this School, in September, 1925, began to reorganize its program in conformity with the general principles of the two-three-graduate plan. A further indication of the high repute of the School, and of the permanency of its need for enlarged facilities and for increased financial support, is the fact that 153 students are now enrolled in the Academic College of the University of Pittsburgh as prospective students of dentistry and are taking the first year of the two-three phase of the combined academic and professional curricula. The classification of the present attendance at the School, on the three plans in operation there during the current transitional period, is shown in the table on page 532. A Graduate Division of the School has been established and will be a part of the Graduate School of the University. An eminent teacher, who has been strongly interested in research, will be made Director of Research and Supervisor of the Division. Beginning in 1926-27 the Division will offer full-year graduate courses in orthodontia, prosthodontia, exodontia, and dental teaching, and will provide special opportunity for dental research. (See the Appendix.) Comparative data relating to students and graduates are given on page 535; to results of license examinations on page 537.

Like most medical schools, that of the University of Pittsburgh gives formal attention to the conventional specialties of medicine, but accords none to odontology, stomatology, or clinical dentistry, although oral conditions are considered informally to some degree in the instruction of medical students in preventive medicine and in clinical medicine. The Assistant Professor of Surgery in the Medical School is Professor of Anatomy and Oral and General Surgery in the Dental School, and is the only personal link between the Schools.

GENERAL COMMENT

OF the six adjoining states, New York, Maryland, and Ohio contain nine dental schools, but there are none in New Jersey, Delaware, and West Virginia. Many students from these six states attend the schools in the State of Pennsylvania, where the number of dental students is larger than in any other state, or in Canada, or in any other country. The recent contribution of each of the three dental schools in this state to the future needs of Pennsylvania in oral health-service may be inferred in a general way from the data in the table on page 535. The figures show that, beginning in 1921-22, after enforcement of an entrance requirement of one year of approved work in an accredited academic college and continuing until 1925-26, the total

DENTAL SCHOOLS IN THE UNITED STATES

DATA ON THE ATTENDANCE (D.D.S.) FROM SEVEN STATES AT THE THREE DENTAL SCHOOLS IN THE STATE OF PENNSYLVANIA: 1924-26

	Pennsylvania		Temple		Pittsburgh		Three schools	
	1924-25	1925-26	1924-25	1925-26	1924-25	1925-26	1924-25	1925-26
1. New Jersey	131	155	95	74	16	10	242	239
2. New York	130	175	7	5	14	17	151	197
3. Pennsylvania	112	123	430	337	942	755	1484	1215
4. Connecticut	11	16	16	12	4	3	31	31
5. Delaware	5	6	4	6	1	1	10	13
6. West Virginia	2	0	1	0	37	30	40	30
7. Ohio	2	2	0	0	55	48	57	50
Combined attendance from the seven states	393	477	553	434	1069	864	2015	1775
Total attendance ¹	440	523	564	459	1095	888	2099	1870

attendance at the University of Pennsylvania steadily fell from the largest to the smallest of the three. Meanwhile, at Temple and Pittsburgh, where graduation from a high school was sufficient for admission before 1925-26, the attendance continued annually to rise. In 1925-26, however, when the three schools had the same admission standards, Pennsylvania gained in total attendance but Temple and Pittsburgh lost. The significance of these conditions is clarified by an examination of the data, on page 535, for the classification of the total attendance. On the higher standard of admission, the first-year class at the University of Pennsylvania has been increasing in size since the sharp decrease in 1921-22, regardless of the competition of the other two schools on a lower standard. In 1925-26, there were sharp drops in the number of first-year students at Temple and Pittsburgh as a consequence of the adoption of a similar entrance requirement (Temple) or a higher one (Pittsburgh).

The data on page 520 suggest that the increase in the size of the first-year classes of dental students at the University of Pennsylvania has been due almost entirely to annual growth in the attendance from New York and New Jersey. It is evident that, as now conducted, this School is much more useful to New York and to New Jersey than to its own state. A direct comparison of the more significant data in the accompanying table for the geographical distribution of the students at the three schools, in 1924-25 and in 1925-26 (December), shows that in each year at the Dental School of the University of Pennsylvania, there were more students from New York and also from New Jersey, than from Pennsylvania; that Temple and Pittsburgh drew their students mainly from Pennsylvania; that at Temple the chief source of dental students outside of Pennsylvania was New Jersey; and that Pittsburgh attracted non-resident students largely from Ohio and West Virginia.

No dental school outside of New York has so many New York students as that of the University of Pennsylvania (page 468). Its high repute in New York has encouraged it to meet all of the regulations for registration in that state (page 470). In May, 1925, the Regents of the State of New York, desiring the continuance of this relation, announced that enforcement of the present entrance requirement in New York, as a condition for the registration of schools outside of New York, would be delayed until 1927 (footnote 3, page 472), in order to give this School and others more time in which to adapt their plans to the New York preference. At the University of Pennsylvania, in conformity with the policy to adjust the dental program to the standards set by the

¹ The minor discrepancies between these figures and those in the table on page 535 are due to the reasons suggested on page 250.

DATA PERTAINING TO THE DENTAL SCHOOLS IN THE STATE OF
PENNSYLVANIA: 1919-26

Total attendance

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Pennsylvania	540	720	598 ¹	609	536	428	518
Temple	159	203	305	399	489	568	462 ¹
Pittsburgh	365	486	638	750	846	1038	888 ¹
Total	<u>1064</u>	<u>1409</u>	<u>1541</u>	<u>1758</u>	<u>1871</u>	<u>2034</u>	<u>1868</u>

Proportion of students resident in Pennsylvania

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Pennsylvania	56	37	35 ¹	37	28	25	23
Temple	79	82	89	85	91	76	90 ¹
Pittsburgh	91	90	90	90	90	86	85 ¹

Number of graduates

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Pennsylvania	42	141	108	198	229	69 ¹	103 ²
Temple	18	22	29	65	62	109	100 ²
Pittsburgh	34	54	77	128	157	176	242 ²
Total	<u>94</u>	<u>217</u>	<u>214</u>	<u>391</u>	<u>448</u>	<u>354</u>	<u>445</u>

Classification of the total attendance

	First year	Second year	Third year	Fourth year	Total
Pennsylvania: 1922-23	115	55 ¹	222	217	609
1923-24	143	95	60 ¹	238	536
1924-25	142	120	94	72 ¹	428
1925-26	177	128	110	103	518
Temple: 1922-23	153	111	70	65	399
1923-24	178	130	111	70	489
1924-25	187	172	98	111	568
1925-26	53 ¹	156	153	100	462
Pittsburgh: 1922-23	247	210	144	149	750
1923-24	251	251	195	149	846
1924-25	374	244	225	195	1038
1925-26	56 ¹	352	238	242	888

New York Regents, which in respect of time are excessive compared with those of the State of Pennsylvania, the entrance requirement, beginning in 1927-28, will become two years of approved work in an accredited academic college. If, however, the lengthening of the pre-dental period should not be attended by a re-integration of the academic and professional curricula, and by a compensatory shortening of the combination to a total of five years, the School at the University of Pennsylvania will probably continue to minister primarily to the needs of other states than its own. A policy at the University of Pennsylvania that tends to encourage 9 out of every 10 prospective Pennsylvania dentists to enter and overcrowd other schools in the state, and which attracts to that School more New Yorkers than Pennsylvanians, may suitably engage the special attention not only of the University and of the citizens of Pennsylvania, but also of the Dental Council and the Department of Education of the state. The

¹ The first group affected by the present minimum entrance requirement of one year of approved work in an accredited academic college.

² The number of seniors (December, 1925).

Empire State with four dental schools, each an integral part of an important university, does not seem to be in need of a degree of help that would entail further sacrifice of the interests of the citizens of Pennsylvania.

If it were believed at the University of Pennsylvania, irrespective of the desire to attract New York students, that the New York standard is educationally and professionally more desirable for the citizens of Pennsylvania than that advocated by the State Dental Council and the State Department of Education, the University, through the agency of the two-three-graduate plan, might exemplify this conviction at much less variance with the present preference of most dental Pennsylvanians than by adoption of the New York two-four plan in its extreme form. Thus, if the professional years were begun in summer sessions, and thereby suitably lengthened, the undergraduate curriculum with its conventional four-year content could be suitably completed in the three lengthened years, the most competent students could be developed into good general practitioners by the end of the fifth calendar year after graduation from the high school, an academic year of time would be saved for professional service by the graduate—and he would be directly admissible to the license examination in New York besides, where presumably the facts of such full equivalence would not be disregarded (page 476).

The two-three-graduate plan complies fully with the related provisions of the Pennsylvania statute, which stipulate that the applicant for a license must submit "proof that he or she . . . has obtained a competent education, together with a diploma conferring upon him or her the degree of Doctor of Dental Surgery or other established dental degree from a reputable *educational institution* . . . maintaining a four years course *in dentistry*." . . . (The italic does not appear in the original.) According to this provision of the statute, the applicant must be a graduate of an "educational institution," not necessarily of a dental school, and of an educational institution that maintains a four-year course "in dentistry," obviously not in technical and clinical dentistry only. The two-three-graduate plan, if put into operation at the University of Pennsylvania, an "educational institution," would include a "four years course in dentistry," in the form of combined curricula comprising all of the sciences and arts of dentistry contained in the four-year curricula of the dental schools in the State of Pennsylvania, in 1924-25 for example. Thus, of the total number of prescribed hours for the first year of the four-year curriculum at the Dental School of the University of Pittsburgh in that year, in full accord then and now with the state law, approximately two-thirds were devoted to biology, chemistry, drawing, and physics, which are commonly included in the curricula of academic colleges, but which are also fundamental parts of dentistry. By official interpretation of the Pennsylvania statute, these academic subjects were "in dentistry" at the University of Pittsburgh during the year 1924-25, and it is clear that they would be "in dentistry" under the same law hereafter, if taught, with the same purpose and as effectually, in any department or school in an accredited "educational institution." By recent action of the Dental Council of Pennsylvania, on an application of the University of Pittsburgh for approval of its new undergraduate dental program, as reorganized on the basis of the two-three-graduate plan (page 532), it was decided in effect, in analogy with the obvious fact that the foundations of a building are "in the building," that in the State of Pennsylvania the academic sciences which should be integrated in the modern practice of dentistry are "in dentistry" in 1925-26, and will remain in it within the meaning of the statute, when taught in an accredited "educational institution."

If the Dental School of the University of Pennsylvania aimed to serve most effectually not only Pennsylvania but also all of the smaller states named in the summary on page 534 that are without dental schools, it could do so through the agency of the two-three-graduate plan. The *New Jersey* statute provides that no person may be examined for a license unless he has been "graduated in course with a dental degree from a dental school, college, or department of a university approved by the State Board of Registration and Examination in Dentistry." The *Connecticut* act specifies that "no license shall be issued to any person unless he shall present a diploma or other certificate of graduation from some reputable dental college or from a department of dentistry of a medical college conferring a dental degree." *Delaware* requires that the applicant for a license must be "a graduate of and have a diploma from a reputable dental college or the dental department of some reputable school or university." In *West Virginia* the applicant for a license "must be a graduate of and have a diploma from the faculty of a reputable dental college, dental school, or dental department of a reputable university." None of these states demands graduation from a dental school that requires its students to be in attendance at that particular school throughout each of four academic years, nor does any of these statutes prohibit admissions to advanced standing. Graduation and the professional degree from a reputable school approved by the state board is sufficient in each instance. The official dental representatives of these states evidently understand that capability in the practice of dentistry may be acquired by more than one educational procedure, and, content to specify general minimum requirements, have refrained from imposing arbitrary or needless restrictions.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the Pennsylvania schools who failed, in the number of states indicated by the figures in parenthesis:

1925.—Pennsylvania, 13.0 (4); Pittsburgh, 0.6 (1); Temple, 7.4 (5); U. S. schools collectively, 11.3.

1910-25 (cumulative). —Pennsylvania, 19.3 (28); Pittsburgh, 2.2 (11); Temple, 17.0 (20); U. S. schools collectively, 14.2.

RHODE ISLAND

Population: 636,218. Number of dentists, 386; physicians, 771. Ratios: dentists to population, 1:1648; physicians to population, 1:825; dentists to physicians, 1:2.0

Statutory requirements. *Dentistry*.—Preliminary education: none. Professional training: degree from a recognized dental school or medical school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college.

Professional training: graduation from a Class A medical school; in addition, one year of interne service in an approved hospital

Dental school: none; medical school: none

SOUTH CAROLINA

Population: 1,770,415. Number of dentists, 365; physicians, 1317. Ratios: dentists to population, 1:4850; physicians to population, 1:1344; dentists to physicians, 1:3.6

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a high school or the equivalent. Professional training: graduation from a dental school approved by the National Association of Dental Faculties (American Association of Dental Schools). *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school

Dental school: none; medical school: Medical College of the State of South Carolina

SOUTH DAKOTA

Population: 663,668. Number of dentists, 354; physicians, 604. Ratios: dentists to population, 1: 1875; physicians to population, 1: 1099; dentists to physicians, 1: 1.7

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited high school. Professional training: graduation from a college above the grade of Class C, as defined by the National Association of Dental Examiners. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school; in addition, one year of interne service in an approved hospital

Dental school: none; medical school: University of South Dakota (gives only the first two years of a four-year curriculum)

TENNESSEE

Population: 2,416,732. Number of dentists, 927;¹ physicians, 3115. Ratios: dentists to population, 1: 2607; physicians to population, 1: 776; dentists to physicians, 1: 3.4

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a high school or the equivalent (15 college entrance units). Professional training: graduation from a reputable dental school having a four-year curriculum. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: diploma from a reputable medical school having a curriculum as high in grade as that of the Department of Medicine of the University of Tennessee

Location of the dental schools: Memphis² and Nashville (2); medical schools (3): Memphis² and Nashville (2)

MEMPHIS²

Population: 173,380. Number of dentists, 168; physicians, 492. Ratios: dentists to population, 1: 1032; physicians to population, 1: 352; dentists to physicians, 1: 2.9
Number of dental clinics or infirmaries, 1; hospitals, sanatoriums, and charitable institutions, 19; hospitals approved for internships, 3

Dental School: University of Tennessee. *Medical School*: University of Tennessee

¹ Dean R. S. Vinsant of the Dental School of the University of Tennessee has corrected an important minus error in the number of dentists in Tennessee, as given in Polk's *Dental Register*.

² The dental and medical schools of the University of West Tennessee were closed on June 1, 1923. See the footnote on page 563.

COLLEGE OF DENTISTRY, UNIVERSITY OF TENNESSEE

Location: Union and Marshall Avenues; one mile from the centre of the city

General character: integral part of the University of Tennessee. The Colleges of Dentistry and Medicine, and the School of Pharmacy, are located in Memphis. The other colleges and schools of the University are situated in Knoxville

Organized: in 1878, in Nashville. In 1877 the College of Dentistry of Nashville was organized in affiliation with the Nashville Medical College. In 1878 the two became, respectively, the Colleges of Dentistry and Medicine of the University of Tennessee. In 1911 the Colleges of Dentistry and Medicine were removed from Nashville to Memphis, where the former absorbed the College of Dental Surgery of the University of Memphis (1909-11)

Building (Rogers Hall): erected in 1901; extensive interior alterations were made in 1920; total floor area, 36,000 sq. ft. Distance from the medical buildings, three blocks

Infirmery: in Rogers Hall, with four accessory rooms; total floor area, 6400 sq. ft. Total number of chairs in active use, 71, including groups reserved for special purposes: prosthodontia and crown and bridge work, 8; extraction and oral surgery, 8

Relation of the School of Medicine (Class A): some of the medico-dental subjects are taught to dental and medical students in separate classes in the laboratories of the Medical School, and some in the dental building (Rogers Hall), by members of the Medical Faculty. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Home and Hospitals in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: Home for Incurables (eight blocks); Memphis General Hospital (two blocks); Baptist Memorial Hospital (two blocks); St. Joseph's Hospital (six blocks); and Crippled Adults' Hospital (five blocks)

Clinical facilities in the Hospitals where dental students received instruction in 1924-25: all have facilities for general operative dentistry and minor oral surgery; all except that for Crippled Adults have facilities for general surgery and maxillo-facial surgery; the dental students witness post-mortem examinations in the General Hospital

Number of dental internships (3) and externships (2), held by students of the School, in the Hospitals in 1924-25: five

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: major operations in exodontia and oral surgery; to teach oral surgery under the conditions that prevail in a good hospital

Library (for the three health-service schools, in Lindsley Hall; three blocks from the dental building): two rooms, 3600 sq. ft.; whole-time librarian and assistant. Contains 5600 bound and 250 unbound volumes, and 475 pamphlets (all effectively card indexed). Of the volumes approximately 1200 relate to dental subjects

Library facilities additional to those in the health-service centre that are conveniently accessible to dental students: none

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: eleven students; total amount, \$3000; all was provided by the School from special loan funds, the principal of which is now \$9000

Dean: whole-time officer; also Professor of Operative Dentistry and Dental Anatomy. *Administrative Officer* (of the health-service schools, collectively): whole-time officer; also Professor of Histology

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1924)

Next prospective advance in the minimum academic requirement for admission: uncertain
Number of graduates (1879-1925): 653; average per year, for forty-seven years, 14. (Number, in 1878, for the College of Dentistry of Nashville—5)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 71; proportion from Tennessee: 1922-23—55 per cent; 1923-24—58 per cent; 1924-25—59 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—1951; 1921-22—2342; 1922-23—2850; 1923-24—5122; 1924-25—5983

Number of visits: 1920-21—7804; 1921-22—9368; 1922-23—11,400; 1923-24—20,488; 1924-25—23,932 (the figures are estimates)

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-21—50; 1921-22—90; 1922-23—125; 1923-24—183; 1924-25—221

Rated Class A by the Dental Educational Council of America (March 5, 1924); last previous rating (1923), Class B

FINANCIAL DATA

Estimated value (Dental School) of land and building, \$340,000, and equipment, \$45,000; total, \$385,000 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): none

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students ²	\$10,725	\$16,423	\$19,549	\$17,840
Fees paid by patients, in all clinical departments	4,256	6,489	8,326	11,416
University funds, additional to the income designated above:				
(a) Direct appropriation	20,662	4,158	22,436	15,513
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget ³	17,439	23,017	23,377	44,952
Total amount of current income	\$53,082	\$50,087	\$73,688	\$89,721
<i>Total amount of current expenditures</i>	\$53,082	\$50,087	\$73,688	\$89,721
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	38,101	27,175	45,813	60,465
<i>Capital expenditure</i> (additional) by the University, for land for a new dental building (from a legislative appropriation)	None	None	None	90,000
Average amount expended by the School per student (D.D.S.) per year	856	527	695	831
Average amount of all student fees paid to the School per student (D.D.S.) per year	172	173	184	165

¹During the academic years 1920-24, there was no surplus, no appropriation by the State directly or by the City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

²The tuition fee for Tennessee students is \$100 less than that for all other students.

³See "Capital expenditure," below.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Details of current expenditures:</i> ¹				
For repairs	\$1,500	\$2,500	\$2,500	\$4,000
For new equipment	1,850	5,779	16,291	21,068
For new construction (no land) ²	17,700	None	None	None
For research	None	None	150	180
For improvement of the library	48	151	1,200	1,200
For supplies used in the clinical departments	4,470	3,784	5,012	6,416
For salaries: for administration	5,250	4,975	5,868	6,115
For salaries: for teaching	18,892	26,902	35,858	42,583
For all other purposes	3,372	5,996	6,809	8,159
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(17)	(16)	(19)	(21)
Amount of their salaries as teachers	9,295	13,665	19,440	24,393
Number of teachers of dental subjects who did not receive salaries	(2)	(2)	(3)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	3,000	4,000	4,000	4,000
Smallest salary paid to a whole-time teacher of a dental subject	1,200	1,200	2,000	2,000
(Number of teachers of academic or medico-dental subjects)	(13)	(16)	(21)	(20)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	9,597	13,237	16,418	18,190
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	3,250	4,000	4,000	4,000
In the Medical School	3,250	4,000	4,000	4,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,800	1,800	1,500	1,600
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	9,597	13,237	16,418	18,190

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 41. Of this total number, 11 were whole-time, 2 half-time, and 4 part-time or occasional teachers of academic or medico-dental subjects; 7 were whole-time, 3 half-time, and 14 part-time or occasional teachers of dental subjects; 7 were whole-time teachers in the Dental School only; 7 were "full" professors; 18 were adjunct, associate, or assistant professors; 2 were lecturers by title; 5 received no salaries; 27 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. or B.A., and D.D.S.: since 1925; now six years in length for B.S. and D.D.S.—seven years, for B.A. and D.D.S.

Curriculum (two years) for dental hygienists: since 1925; attendance: 1925-26—3 (December)
No course for dental mechanics, assistants, or technicians; no graduate course in dentistry;

¹ During the academic years 1920-24, there was no payment on account of debt or rent.

² See "Capital expenditure," on page 540.

DENTAL SCHOOLS IN THE UNITED STATES

STUDENTS AND GRADUATES: COLLEGE OF DENTISTRY, UNIVERSITY OF TENNESSEE

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	59	53	64	102	118	123
Women.....	2	3	2	2	2	3
From other countries.....	0	0	0	0	0	0
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	57	53	62	95	106	108
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	19	2	7	7	10	3
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	0	1	1	2	7	4
Denied further instruction because of deficient scholarship.....	0	0	0	0	3	8
GRADUATES (D.D.S.)						
Total number of graduates.....	22	20	9	11	14	21
Women.....	0	0	1	0	1	0
Admitted to practice in other countries.....	0	0	0	0	0	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	5	3	2	4	4	5
Percentages of failures in such state-board examinations.....	10.5	31.6	0	9.1	0	0

no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research: actively in progress in 1924-25, on corrosion of metals; expansion, contraction, and strength of casting investments as affected by the length of the various setting periods and by the degree of heat applied; no publication by teachers of dental subjects in 1924 or 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: statistics on the dental needs of towns and counties in Tennessee are kept before the students

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: February, 1922; June, 1924

The foregoing data have been verified in detail by the Dean

SUMMARY

THE University of Tennessee, aiming to develop its Health Centre in Memphis, has initiated a building program that provides, at a cost of approximately \$3,500,000, for the erection of nine new buildings to house the Colleges of Medicine and Dentistry, and the Schools of Pharmacy, Public Health, and Social Welfare. At present this is the most complete program in the South for the development of health-service education. The first unit, for general laboratories of anatomy, chemistry, and physiology, which is now under construction, will be ready for occupancy in September, 1926. Since 1923, under a new administration, the School has been greatly improved and intimately coordinated with all of the associated schools. Not only has the quality of the instruction been bettered, but in 1924-25 the entrance requirement was raised to one year of approved work in an accredited academic college. Most of the dental schools in adjacent states having remained on a lower requirement, however, the first-year class decreased in size from 28 in 1923-24 to 4 in 1924-25, but increased to 17 in 1925-26 (December), an indication that adjustment to the higher standard has already begun. After the elevation of the entrance requirement in all Class A and Class B schools to include at least one year of approved work in an accredited aca-

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF
TENNESSEE: 1924-25

States (14)	First year ¹	Second year	Third year	Fourth year	Total
Alabama	0	1	1	2	4
Arkansas	0	0	3	3	6
Louisiana	0	0	2	1	3
Mississippi	1	3	4	3	11
Tennessee	2	20	14	15	51
Florida, Georgia, Missouri, Oklahoma, South Carolina, Virginia — one each	0	2	0	4	6
Kentucky, Michigan, Texas — two each	1	2	2	1	6
Total	4	28	26	29	87

demic college, beginning in 1926-27, this School should be one of the most widely appreciated in the South.

The Faculty has been restricting its attention to the undergraduate curriculum, but recently (1925-26) established a two-year curriculum for the training of dental hygienists, based on graduation from a high school. Research has not yet become active. The dental section of the library for the associated schools, which is well conducted, has been growing steadily. The University has been giving the School increasing financial support. The salaries for instruction, although inadequate, have been raised from \$18,892 for 30 teachers in 1920-21 to \$45,676 for 41 teachers in 1924-25. For the dental subjects, the salaries have risen from \$9295 for 17 teachers in 1920-21 to \$26,710 for 24 teachers in 1924-25. At present the minimum whole-time salary is \$2250; the maximum is \$4000. Although the relation between the Medical and Dental Schools is close and very helpful to the Dental School, it has not removed the traditional indifference of the medical teachers to instruction for medical students in oral health-service. The conventional specialties receive the usual formal attention in the Medical School, but neither stomatology nor clinical dentistry finds a place in the medical curriculum. Oral surgery, included in plastic surgery, is taught informally by two assistants whose professional degree in each case is M.D. None of the teachers of dental subjects is a member of the Medical Faculty.

The geographical distribution of the students, in 1924-25, is shown in the accompanying table, where it may be noted that they resided chiefly in Tennessee, Mississippi, and Arkansas, and that practically all were from the South. Comparative data relating to students, graduates, and results of license examinations, are given on pages 554-555.

NASHVILLE

Population: 123,822. Number of dentists, 124; physicians, 361. Ratios: dentists to population, 1: 998; physicians to population, 1: 343; dentists to physicians, 1: 2.9

Number of dental clinics or infirmaries, 8; hospitals, sanatoriums, and charitable institutions, 18; hospitals approved for internships, 5

Dental Schools: (1) Vanderbilt University; (2) Dental Department, Meharry Medical College. Medical Schools (2): Vanderbilt University, and Meharry Medical College

(1) SCHOOL OF DENTISTRY, VANDERBILT UNIVERSITY

Special note. The Medical School began the year 1925-26 in new buildings on the main site of the University (two miles from the dental building). The Dental School remains on the old site, pending the prospective receipt of funds sufficient to enable the University to house the School in a new building adjacent to the Medical School and Hospital. See the Appendix

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college. The present first-year class contains seventeen students (December, 1925).

Location: with the School of Medicine on South Campus (formerly occupied by Peabody Normal College); one mile from the centre of the city

General character: integral part of Vanderbilt University

Organized: in 1879

Building (Dental Hall): erected in 1910; occupied since 1911; special improvements were made in 1922 and 1923; total floor area, 13,400 sq. ft. Distance from the main site of the University (West Campus), two miles. The College of Arts and Science, and the Schools of Religion, Law, and Engineering are located on the West Campus

Infirmary: in Dental Hall, with six accessory rooms; total floor area, 7034 sq. ft. Total number of chairs in active use, 86, including groups reserved for special purposes: prosthodontia, 4; extraction, 2; roentgenography, 1

Relation of the School of Medicine (Class A): in 1924-25 all of the medico-dental subjects were taught to dental students in separate classes, in the laboratories of the Medical School, by members of the Medical Faculty. In 1924-25, one teacher of a medical subject gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry. See "Special note," on page 544; also the "Summary," on page 547

Dispensary or Hospital in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: none

Library (primarily medical): two rooms, 2026 sq. ft.; whole-time librarian. Contains 11,151 bound and 778 unbound volumes, and 3082 pamphlets (all effectively card indexed). Of the volumes, 1024 relate to dental subjects. See the "Summary," page 548

Library facilities additional to those indicated above that are conveniently accessible to dental students: Y. M. C. A. Library (South Campus); in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: eight students; total amount, \$2315 (fees, \$1935; supplies, \$380), of which none was provided by the School; all were ex-service men, supported by the U. S. Veterans Vocational Bureau

Dean: part-time officer; also Professor of Exodontia, Mouth Surgery, and Roentgenology.
Assistant Dean: whole-time officer; also Professor of Operative Dentistry, and Director of the Clinic and Dental Laboratories

Minimum academic requirement for admission to the first-year class in September, 1924: one year of approved work in an accredited academic college (since 1923)

Next prospective advance in the minimum academic requirement for admission: two years of approved work in an accredited academic college "as soon as it may be practical to exact it"

Number of graduates (1880-1925): 1539; average per year, for forty-six years, 33

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 132; proportion from Tennessee: 1922-23 — 35 per cent; 1923-24 — 36 per cent; 1924-25 — 37 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21 — 560; 1921-22 — 1180; 1922-23 — 1802; 1923-24 — 1878; 1924-25 — 3344

Number of visits (sittings, or operations): 1920-21 — 3360; 1921-22 — 7080; 1922-23 — 10,812; 1923-24 — 11,268; 1924-25 — 20,064 (the figures are estimates)

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1920), Class A

FINANCIAL DATA

Estimated value (Dental Hall) of building, \$29,825, and equipment, \$16,945; total, \$46,770 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): none

	(1)	(2)	(3)	(4)
Data for years ending on April 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Surplus used during the year	None	None	\$768	None
Fees (all kinds) paid by the students	\$25,940	\$33,322	44,466	\$36,384
Fees paid by patients, in all clinical departments	3,977	6,215	11,669	14,878
Miscellaneous receipts	5,174	1,721	1,344	839
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	None	None
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	10,000	10,000	10,000	10,000
Total amount of current income	\$45,091	\$51,258	\$68,247	\$62,101
<i>Total amount of current expenditures</i>				
Surplus for the year	4,027	2,079	None	2,175
Accumulated surplus: held by the University to the credit of the School	5,301	7,380	6,612	8,787
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	5,973	7,921	10,768	7,825
Average amount expended by the School per student (D.D.S.) per year	331	286	322	346
Average amount of all student fees paid to the School per student (D.D.S.) per year	209	194 ²	210	210
<i>Details of expenditures:</i> ³				
For repairs	1,658	1,234	3,285	1,627
For new equipment	1,313	1,694	10,636	1,424
For research	None	None	None	None
For improvement of the library	123	173	145	126
For supplies used in the clinical departments	1,324	2,340	3,992	4,728
For salaries: for administration	2,750	3,048	3,180	3,840
For salaries: for teaching	25,108	31,520	37,052	38,506
For all other purposes	8,788	9,170	9,957	9,675
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(15)	(20)	(21)	(22)
Amount of their salaries as teachers	11,358	16,825	22,427	24,406
Number of teachers of dental subjects who did not receive salaries	(2)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	3,500	3,500	3,500	3,500

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² Delayed settlement with the U. S. Veterans Vocational Bureau, involving approximately \$3000, is the cause of this variation from the annual average.

³ During the academic years 1920-24, there was no payment on account of debt, rent, new construction, or land.

DENTAL SCHOOLS IN THE UNITED STATES

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on April 30				
Smallest salary paid to a whole-time teacher of a dental subject	\$1,200	\$1,200	\$1,200	\$1,200
(Number of teachers of academic or medico-dental subjects)	(15)	(17)	(18)	(13)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	13,750	14,695	14,625	14,100
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	450	400	600	1,000
In the Medical School	3,400	3,400	4,000	4,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	150	300	100	150
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the allotment referred to above)	10,000	10,000	10,000	10,000

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 35. Of this total number, 4 were whole-time, 2 half-time, and 6 part-time or occasional teachers of academic or medico-dental subjects; 10 were whole-time, 3 half-time, and 10 part-time or occasional teachers of dental subjects; 10 were whole-time teachers in the Dental School only; 12 were "full" professors; 3 were associate or assistant professors; 5 were lecturers by title; 2 received no salaries; 19 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

No combined curricula leading to the degrees of B.S. or B.A., and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

STUDENTS AND GRADUATES : SCHOOL OF DENTISTRY, VANDERBILT UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D. D. S.)						
Maximum attendance.....	94	86	130	176	217	175
Women.....	1	1	2	2	2	3
From other countries; chiefly from Japan and Central America.....	4	6	4	3	2	1
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	70	76	124	172	212	173
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	2	2	1	5	0	0
From other countries, to advanced standing.....	1	1	0	0	0	0
"Repeaters" of one or more subjects.....	1	1	0	0	2	1
Denied further instruction because of deficient scholarship.....	0	0	2	0	1	0
GRADUATES (D. D. S.)						
Total number of graduates.....	43	6	9	14	40	48
Women.....	0	0	0	1	0	1
Admitted to practice in other countries.....	1	1	1	1	2	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	9	4	4	7	8	12
Percentages of failures in such state-board examinations.....	12.2	0	0	9.1	0	0

Research: none in progress in 1924-25; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service, but the School coöperates actively with prominent citizens of Tennessee towns in need of dentists

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: February, 1922; June, 1924

The foregoing data have been verified in detail by the Assistant Dean

SUMMARY

THE removal of the Medical School to the West Campus, in fine new buildings adjacent to the University Hospital and School of Nursing, and the ensuing isolation of the Dental School on the old site, are the outstanding features in the recent history of health-service education at Vanderbilt. The previous strength of the Dental School has been impaired, and its deficiencies have been accentuated, by its separation from the Medical School after years of close coördination. Under present conditions the Dental School will probably be unable to maintain a Class A grade. The traditional attitude toward dentistry of nearly all of the promoters of medical education has been shown in a striking manner by the recent trend of events at Vanderbilt. The Announcement of the Medical School for 1925-26 contains these statements:

"In view of the past record of the School and of the favorable location of Nashville as an educational and medical centre, Vanderbilt University was selected by the General Education Board of New York as offering an excellent opportunity for the development of medical education, especially in the Southern States. Accordingly in 1919 this Board appropriated the sum of \$4,000,000 to enable the University to effect a complete reorganization of its School of Medicine, *in accordance with the most exacting demands of modern medical education.*¹ . . . In June 1921 . . . it was decided . . . to construct an entirely new plant on the main campus of the University and *abandon the developments on the South Campus.*¹ . . . The advisability of the move was generally recognized, and it became possible by the active coöperation of the Carnegie Corporation and the General Education Board. By the action of this latter body the University authorities were permitted to use what was needed of the initial appropriation of \$4,000,000 for the erection of a medical school and hospital on the West Campus. The General Education Board and the Carnegie Corporation then united, each giving half of \$3,000,000 to provide additional endowment for the School of Medicine for its operation in the new plant . . . [which] consisting of a hospital, laboratories for all departments, a school of nursing and power plant . . . [have been completed at an expense of] approximately \$3,000,000. . . . There remains . . . of the original . . . gifts and the [additional] appropriations . . . a sum of \$5,000,000 for endowment of the School of Medicine and of the . . . Hospital." Besides, through supplementary gifts "running over a period of years," provision has been made for "travelling fellowships for newly appointed members of the Faculty and for the development of a department of preventive medicine"; and \$100,000 has been received "for the purpose of furthering the development of nursing," which "places the Vanderbilt Hospital School of Nursing on a sound educational basis, comparable to that of the School of Medicine with which it is closely coördinated."

None of these benefactions was made or accepted with due regard for the facts that endeavor to prevent maladies of the teeth and mouth, and the remedial treatment of oral ailments, are essential features of a complete modern program of health service for a person

¹ The italic does not appear in the original.

or for a community. Prevention of dental and oral diseases receives very little attention in any of the medical schools in North America, and oral diagnosis is usually ignored or given perfunctory notice in the instruction in physical diagnosis. The Vanderbilt Medical School, like most medical schools, has been teaching such subjects as otolaryngology and ophthalmology in formal courses, but has not been giving analogous attention to odontology or to stomatology. In the statement of the curriculum for the fourth year, as it appears in the annual Announcement, one finds the usual array of names of miscellaneous subjects—seventeen required courses for from 11 to 198 hours each, and an average of 59 hours, for the year—but the list does not refer to clinical dentistry. Now, however (1925-26), the School extends to dental surgery this recognition (Announcement, page 35): "*Although no set instruction is given in dental surgery and dentistry, students are expected to accompany the cases that are assigned to them when they are referred for consultation and examination to the dental clinic [in the Out-patient Department of the University Hospital]. By this means the relations of dental conditions to the general health may come to be better appreciated.*"¹ The Dean of the Dental School and the "Assistant to the Chair of Oral Surgery" in the Dental School, who have charge of this work for medical students, are the present "dental surgeons" on the surgical staff of the University Hospital, but their names are not included in the published register of the "Faculty and Teaching Staff" of the Medical School.

A great medical centre such as that at Vanderbilt cannot be complete without a dental school in close coordination with the other units. At Vanderbilt there is an exceptional opportunity for public benefaction to advance the most effectual teaching and research in oral health-service. On October 16, 1925, in an address at the semi-centennial celebration of the establishment of the University, the Chancellor, deploring the possibility that the University might be compelled to discontinue the Dental School, appealed for funds sufficient to enable the University to erect a new dental building in close association with the Medical School, and for a moderate endowment in support of dental education. Where, for any reason, existing dental schools cannot be given adequate public support, their discontinuance is plainly indicated. A neglected dental school in a university having a superior medical school not only is undesirable in itself but also, by the implications from the contrast it presents, is a source of embarrassment for all who are earnestly engaged in the advancement of dental education.

The removal of the Medical School from the old site included the library, only the den-

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT VANDERBILT UNIVERSITY: 1924-25

<i>States (16) and foreign country (1)</i>	<i>First year</i>	<i>Second year²</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Alabama	2	2	11	15	30
Arkansas	0	1	3	2	6
Florida	1	0	1	2	4
Kentucky	1	0	2	2	5
Louisiana	2	0	4	1	7
Mississippi	1	0	5	1	7
Tennessee	8	0	16	28	52
Texas	0	0	7	5	12
Virginia	1	1	3	3	8
Central America, Illinois, Missouri, New York, South Carolina— one each	1	0	2	2	5
North Carolina, Oklahoma, Washington—two each	1	1	2	2	6
Total	18	5	56	63	142

¹ The italic does not appear in the original.

² The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

tal section of which remains with the Dental School. The vacated medical buildings have been temporarily adjusted to the needs of the Dental Faculty. Instruction of the dental students in anatomy, chemistry, and metallurgy is now given at the Medical School or the Academic College (1925-26). Without special funds for the support of dental education, the University has been conducting the School on the income from fees. The salaries of the teachers have been low, the attention of the Faculty has been confined to the undergraduate curriculum, and the School has been inattentive to research. The geographical distribution of the students, in 1924-25, is shown in the table on page 548, where it may be seen that although most of the students resided in Tennessee, Alabama, and Texas, a wide southern region was represented. Comparative data relating to students, graduates, and results of license examinations, are given on pages 554-555.

(2) DEPARTMENT OF DENTISTRY, MEHARRY MEDICAL COLLEGE

Location (dental building): First Avenue, South, and Chestnut Street; one and one-half miles from the centre of Negro population in Nashville

General character: integral part of Meharry Medical College, which consists of Departments of Medicine, Dentistry, Pharmacy, and Nurse Training. Some of the facilities are used in common

Organized: in 1915, when incorporation of the Meharry Medical College included the Meharry Dental College (Walden University, Nashville), which had been established in 1886, "for the purpose of providing dental education for colored students"

Building (dental): erected in 1888, on the present site of the Medical College. One annex was added in 1904; one in 1917; another in 1923; total floor area, 14,235 sq. ft. From 1889 to 1923, it was used jointly by the Departments of Dentistry and Pharmacy; since 1923 it has been occupied exclusively by the Department of Dentistry

Infirmery: in the dental building, with four accessory rooms; total floor area, 5829 sq. ft. Total number of chairs in active use, 63, including groups reserved for special purposes: prosthodontia, 15; extraction, 2; roentgenography, 1

Relation of the Department of Medicine (Class A): the medico-dental subjects are taught to dental students in separate classes, in the laboratories of the Medical Department, by members of the Medical Faculty. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital and Dispensary in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: Hubbard Hospital and Dispensary (adjacent)

Clinical facilities in the Hospital and Dispensary where dental students received instruction in 1924-25: complete for general surgery and oral surgery

Number of dental internships (2) and externships (1), held by officers of the School, in the Hospital in 1924-25: three

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: oral surgery; to teach the practice of dentistry under the conditions that prevail in a good hospital

Library (for all of the Meharry Departments): room, 440 sq. ft.; whole-time librarian. Contains 758 bound and 476 unbound volumes, and 330 pamphlets (not effectively card indexed). Of the volumes, approximately 100 relate to dental subjects

Library facilities additional to those indicated above that are conveniently accessible to dental students: none

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

President: whole-time officer in the Medical College; also Professor of Physical Diagnosis and Principles of Medicine in the Dental Department. *Dean or Associate Dean*: none.

Director of the Dental Clinic and Laboratories: whole-time officer; also Assistant Professor of Prosthetic Dentistry and Professor of Metallurgy

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1924)

Next prospective advance in the minimum academic requirement for admission: uncertain

Number of graduates (1916-25): 514; average per year, for ten years, 51. (Number for Meharry Dental College of Walden University, 1887-1915—300; average per year, for twenty-nine years, 10)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 233; proportion from Tennessee: 1922-23—10 per cent; 1923-24—9 per cent; 1924-25—13 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—3300; 1921-22—4500; 1922-23—7878; 1923-24—4106; 1924-25—4299 (the figures for 1920-22 are estimates)

Number of visits, sittings, or operations: 1920-25—no available data

Number of patients treated in the Hospital and Dispensary, by dental students under the supervision of representatives of the Dental School: 1920-21—103; 1921-22—190; 1922-23—210; 1923-24—175; 1924-25—180

Rated Class B by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value (dental building) of land and building, \$100,000, and equipment, \$25,000; total, \$125,000 (June 30, 1925)

General debt on the Department or carried by the Medical College on the Department's account (June 30, 1925): none

	(1)	(2)	(3)	(4)
Data for years ending on May 25	1920-21	1921-22	1922-23	1923-24
<i>Current income</i> : ¹				
Fees (all kinds) paid by the students	\$35,674	\$37,209	\$51,225	\$49,930
Fees paid by patients, in all clinical departments	2,512	2,319	4,587	5,169
Medical College funds, additional to the income designated above:				
(a) Direct appropriation	9,000	None	None	None
(b) Estimated amount of miscellaneous income available to the Department as an integral part of the Medical College, but not specified in the dental budget	1,500	776	2,000	2,000
Total amount of current income	\$48,686	\$40,304	\$57,812	\$57,099
<i>Total amount of current expenditures</i>	\$47,088	\$39,902	\$55,022	\$52,485
Surplus for the year; paid to the Medical College	1,598	402	2,790	4,614
Accumulated surplus: held by the College to the credit of the Department ²	6,598	7,000	9,790	14,404
Amount expended for the Department by the Medical College, in excess of dental income, and included in "Medical College funds," above	8,902	374	None	None

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

² The accumulated surplus on May 25, 1920, was \$5000.

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on May 25				
Average amount expended by the Department per student (D.D.S.) per year	\$138	\$116	\$167	\$210
Average amount of all student fees paid to the Department per student (D.D.S.) per year	105	108	155	200
<i>Details of expenditures:</i> ¹				
For repairs	2,000	1,500	2,000	1,994
For new equipment	2,000	2,000	4,000	3,600
For new construction (no land)	3,000	None	None	2,300
For research	None	None	None	None
For improvement of the library	250	250	300	300
For supplies used in the clinical departments	2,358	2,102	4,522	4,280
For salaries: for administration	2,500	5,000	5,000	8,500
For salaries: for teaching	17,500	21,000	25,000	25,402
For all other purposes	17,480	8,050	14,200	6,109
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(15)	(18)	(20)	(30)
Amount of their salaries as teachers	13,500	16,050	20,000	17,402
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the President's salary)	1,500	2,400	2,400	2,400
Smallest salary paid to a whole-time teacher of a dental subject	400	400	400	1,000
(Number of teachers of academic or medico-dental subjects)	(9)	(9)	(10)	(18)
Amount of their salaries as teachers	4,000	4,950	5,000	8,000
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental Department	None	None	None	None
In the Medical Department	1,500	2,000	2,000	2,500
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	800	1,200	1,320	1,500
Estimated proportionate share (for the Dental Department) of the salaries of these teachers that was not included in the dental budget, but was paid by the Medical College	None	None	None	None

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 48. Of this total number, 14 were whole-time, 8 half-time, and 8 part-time or occasional teachers of academic or medico-dental subjects; 7 were whole-time, 2 half-time, and 9 part-time or occasional teachers of dental subjects; 7 were whole-time teachers in the Dental Department only; 14 were "full" professors; 16 were associate, assistant, or clinical professors; none were lecturers by title; all received salaries; 10 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

No combined curricula leading to the degrees of B.S. or B.A., and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists

¹During the academic years 1920-24, there was no payment on account of debt or rent.

STUDENTS AND GRADUATES: DENTAL DEPARTMENT, MEHARRY MEDICAL COLLEGE

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.): ALL NEGROES						
Maximum attendance.....	196	297	343	347	330	265
Women.....	2	4	0	0	1	3
From other countries; chiefly from the British West Indies.....	10	17	4	4	6	15
Attendance at the end of the year.....	181	290	340	343	330	260
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	0	0	0	1	0	2
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	0	0	0	0	6	3
Denied further instruction because of deficient scholarship.....	0	0	0	0	2	1
GRADUATES (D.D.S.): ALL NEGROES						
Total number of graduates.....	54	54	34	40	107	91
Women.....	2	0	0	0	1	3
Admitted to practice in other countries.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	11	19	15	10	19	18
Percentages of failures in such state-board examinations.....	23.0	21.3	23.3	12.1	23.2	23.8

(nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research: none in progress in 1924-25; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service, but the students are repeatedly urged to go where the need of the Negro for oral health-service is greatest

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: February, 1922; June, 1924

The foregoing data have been verified in detail by the President

SUMMARY

ON page 92, in the chapter on the deficiency of dental service for the Negro group, special attention is drawn to the character and general needs of this School, which is the larger of the two for colored students of dentistry. The relationships of the Dental School to the other schools in the Meharry group are intimate and mutually helpful. The School receives important guidance and coöperation from the Assistant Dean and other members of the Faculty of the Vanderbilt Dental School, who deserve public commendation for their earnest coöperation in the effort at Meharry to promote health service for the Negro group. The School needs a whole-time teaching Dean and a larger number of experienced instructors, including several who would be particularly competent to develop manual dexterity in the average student; also improved equipment, and adequate endowment to enable the School to strengthen its work, to extend the scope of its instruction, and to enhance

NUMBER OF STATES IN WHICH MEHARRY DENTAL GRADUATES HAVE TAKEN THEIR INITIAL LICENSE EXAMINATIONS: 1918-25

	1918	1919	1920	1921	1922	1923	1924	1925
Meharry	8	11	19	15	10	19	18	17
Howard	8	0	9	5	6	9	8	5
School for white students having the widest distribution of graduates	14	15	9	11	10	15	18	12
	(two)				(two)			(two)

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT MEHARRY MEDICAL COLLEGE: 1924-25

<i>States (27), territory (1), and foreign countries (4)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Alabama	1	1	0	5	7
Arkansas	0	1	1	3	5
British West Indies	0	2	1	3	6
California	0	1	1	3	5
Florida	3	0	1	1	5
Georgia	2	1	0	7	10
Illinois	2	5	2	1	10
Kentucky	4	2	2	4	12
Louisiana	0	2	1	2	5
Mississippi	1	4	1	1	7
New York	1	4	3	1	9
North Carolina	2	3	1	8	14
Oklahoma	0	0	3	2	5
Pennsylvania	1	2	1	1	5
South Carolina	3	1	2	5	11
Tennessee	5	7	11	4	27
Texas	4	7	5	11	27
Virginia	3	3	1	2	9
Canada, Connecticut, District of Columbia, Indiana, Kansas, Maryland, New Jersey, Panama (Republic), West Africa, Wisconsin — one or two each	6	3	2	3	14
Michigan, Missouri, Ohio, West Virginia — three or four each	4	7	3	0	14
Total	42	56	42	67	207

its national usefulness. An endowment of \$1,000,000, and a special fund of at least \$500,000 for the immediate improvement of all of the Dental School's facilities, would enable Meharry to meet its most urgent present responsibilities in dental education for the Negro group. In the instruction of medical students, the Medical Department of Meharry gives courses in the conventional specialties of medicine but pays only incidental attention to oral health-service. Oral surgery is included informally in surgery.

The growing national importance of the School is evidenced by the fact that during the past six years its graduates have taken their first license examinations in a larger number of states than the graduates of any other dental school. The data in the accompanying table for the geographical distribution of the students, in 1924-25, show that twenty-seven states, the District of Columbia, and four countries other than the United States were represented. Comparative data relating to students, graduates, and results of license examinations, are given on pages 554-555.

GENERAL COMMENT

OF the eight bordering states, North Carolina, Alabama, Mississippi, and Arkansas are without a dental school, and a large proportion of the students in the Tennessee schools are regularly admitted to practice in the last three of these states. Missouri, Kentucky, Virginia, and Georgia collectively contain six dental schools, at half of which there are a few students from Tennessee. In the table of comparative data on page 554, the low percentages for Tennesseans among the students indicate that the schools in this state contribute largely to the extension of dental practice elsewhere. The recent elevation of the entrance requirement at each school had the usual effect

of decreasing the size of the next succeeding first-year class. At the University of Tennessee the number of first-year students is tending to return to previous totals. The decline in total attendance at each of the three schools has lately been continuous — at Meharry it began before the new academic requirement went into effect. At Vanderbilt, under the unfavorable conditions mentioned on page 547, the first-year attendance during the past two years has been stationary.

The School at the University of Tennessee, which has been closely coordinated with all of the units in the Memphis centre for education in health service, and the School at Meharry, if effectually supported, could obviously train sufficient dentists to meet the needs of the state. In recent years the proportion of Tennesseans among the dental students has been rising at the State University but falling at Vanderbilt. If Vanderbilt should find it impossible to obtain funds sufficient for the development of an excellent dental school in close association with its exceptional Medical School, and thus to minister to the welfare of the South in a broad way, continuance of its present Dental School would be undesirable. In the event of the School's discontinu-

DATA PERTAINING TO THE THREE DENTAL SCHOOLS IN THE STATE OF
TENNESSEE: 1919-26

Total attendance

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Tennessee	53	62	95	106	108	85 ¹	75
Vanderbilt	76	124	172	212	173 ¹	141	97
Meharry	290	340	343	330	256	183 ¹	157
Total	419	526	610	648	537	409	329

Proportion of students resident in Tennessee

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Tennessee	45	48	49	55	58	59	65
Vanderbilt	38	35	38	35	36	37	28
Meharry	10	8	9	10	9	13	13

Number of graduates

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Tennessee	20	9	11	14	21	27	29 ²
Vanderbilt	6	9	14	40	48	63	55 ²
Meharry	54	34	40	107	91	53	43 ²
Total	80	52	65	161	160	143	127

Classification of the total attendance

	First year	Second year	Third year	Fourth year	Total
Tennessee: 1923-24	28	29	30	21	108
1924-25	3 ¹	28	26	28	85
1925-26	17	1 ¹	28	29	75
Vanderbilt: 1923-24	5 ¹	58	62	48	173
1924-25	17	5 ¹	56	63	141
1925-26	18	18	6 ¹	55	97
Meharry: 1923-24	55	46	53	102	256
1924-25	33 ¹	50	36	64	183
1925-26	26	32 ¹	56	43	157

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

² The number of seniors (December, 1925).

ance, a Department of Stomatology in the Medical School, associated with the dental clinic in the Out-patient Department of the Hospital, could give the instruction in oral health-service that the students of medicine and nursing should receive. Such an innovation might set an instructive example for North American medical schools in general.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the Tennessee schools who failed, in the number of states indicated by the figures in parenthesis:

1925.—Tennessee, 7.4 (6); Meharry, 15.4 (17); Vanderbilt, 4.9 (12); U. S. schools collectively, 11.3.

1910-25 (cumulative).—Tennessee, 7.4 (13); Meharry, 26.2 (27); Vanderbilt, 5.0 (21); U. S. schools collectively, 14.2.

TEXAS

Population: 5,058,089. Number of dentists, 1511; physicians, 6063. Ratios: dentists to population, 1:3348; physicians to population, 1:834; dentists to physicians, 1:4.0

Statutory requirements. *Dentistry*.—Preliminary education: none. Professional education: graduation from a reputable dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a reputable medical school, and (since 1925) one year of interne service in an approved hospital

Location of the dental schools (2): Dallas and Houston; medical schools (2): Dallas and Galveston

DALLAS

Population: 190,655. Number of dentists, 143; physicians, 494. Ratios: dentists to population, 1:1333; physicians to population, 1:386; dentists to physicians, 1:3.5

Number of dental clinics or infirmaries, 1; hospitals, sanatoriums, and charitable institutions, 16; hospitals approved for internships, 2

Dental School: Baylor University. *Medical School*: Baylor University

COLLEGE OF DENTISTRY, BAYLOR UNIVERSITY

Location (clinical building): 1420 Hall Street; three blocks from the main site of the group of health-service schools of Baylor University, and one and one-half miles from the centre of the city

General character: integral part of Baylor University. The Baylor Schools of Dentistry, Medicine, Nursing, and Pharmacy are grouped in Dallas. The remaining departments of the University are situated in Waco

Organized: in 1918, by absorption of the "State Dental College" (1905-18), a proprietary school. See the "Summary," page 559

Buildings: two. The clinical building was erected in 1908; special improvements were made in 1918; total floor area, 10,832 sq. ft. A second building (three blocks from the clinical building and adjacent to the central laboratory buildings), which was acquired and remodeled during the summer of 1923, contains laboratories for instruction in

- dental technology; floor area used for instruction in dentistry, 11,316 sq. ft. Total floor area in both buildings devoted to dental technology and clinical dentistry, 22,148 sq. ft.
- Infirmary*: in the "clinical" building, with four accessory rooms; total floor area, 4824 sq. ft. Total number of chairs in active use, 61, including groups reserved for special purposes: prosthodontia, 12; orthodontia, 3; examination, extraction, and oral surgery, 2 each; roentgenography, 1
- Relation of the School of Medicine (Class A)*: the medico-dental subjects are taught to the dental students in separate classes, by members of the Medical Faculty, in the laboratories in two buildings that are used by all of the schools in the health-service group. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry
- Hospitals* in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: Baylor University Hospital (three blocks), and Parkland City Hospital (one mile)
- Clinical facilities* in the Hospitals where dental students received instruction in 1924-25: complete for all phases of oral surgery and dental medicine
- Number of dental internships* or externships, held by students of the School, in the University Hospital in 1924-25: none; one of the seniors serves as an externe in the Dispensary (18 hours weekly)
- Nature and specific purposes of the accredited clinical instruction* given elsewhere than in the dental building, in 1924-25: courses in physical diagnosis, principles of surgery, oral surgery, and anesthesia; to teach the practice of dentistry under the conditions that prevail in good hospitals
- Library*: for all the associated professional schools; in the building containing the laboratories for dental technology. Two rooms: 3200 sq. ft.; whole-time librarian. Contains 4100 bound and 200 unbound volumes, and 550 pamphlets (all effectively card indexed). Of the volumes, approximately 450 relate to dental subjects
- Library facilities* additional to those indicated above that are conveniently accessible to dental students: none
- Scholarships, fellowships, or similar financial assistance* received by dental students in 1924-25: none
- Dean*: part-time officer; also Professor of Oral Surgery. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: Secretary and Registrar of the group of health-service schools; whole-time officer
- Minimum academic requirement* for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (15 units), or its equivalent (since 1918)
- Next prospective advance* in the minimum academic requirement for admission: one year of approved work in an accredited academic college, beginning in September, 1926
- Number of graduates* (1919-25): 176; average per year, for seven years, 25. (Number for the State Dental College, 1906-18-195; average per year, for thirteen years, 15)
- Average total attendance*, per year (at the end of the year), for the past seven years (1919-25): 126; proportion from Texas: 1922-23-98 per cent; 1923-24-96 per cent; 1924-25-82 per cent
- Clinical service* of the Dental School in the instruction of students:
 Number of persons treated: 1920-21-2111; 1921-22-2830; 1922-23-3719; 1923-24-5357; 1924-25-7291
 Number of visits: 1920-21-4578; 1921-22-4397; 1922-23-9717; 1923-24-16,415; 1924-25-21,912

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-21—388; 1921-22—515; 1922-23—722; 1923-24—906; 1924-25—702

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class B

FINANCIAL DATA

Estimated value (Dental School) of land and buildings, \$80,000, and equipment, \$83,200; total, \$163,200 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): none

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$16,740	\$20,212	\$26,371	\$38,467
Fees paid by patients, in all clinical departments	7,004	9,872	12,322	19,881
University funds, additional to the income designated above:				
(a) Direct appropriation	16,027	18,871	16,175	3,031
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	9,700	10,250	10,750	10,750
Total amount of current income	\$49,471	\$59,205	\$65,618	\$72,129
<i>Total amount of current expenditures</i>	\$49,471	\$59,205	\$65,618	\$72,129
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	25,727	29,121	26,925	13,781
Average amount expended by the School per student (D.D.S.) per year	543	533	501	424
Average amount of all student fees paid to the School per student (D.D.S.) per year	184	182	201	226
<i>Details of expenditures:</i> ²				
For repairs	350	900	300	2,000
For new equipment	3,100	2,700	1,100	3,550
For new construction (no land)	1,210	None	None	None
For research	None	None	None	None
For improvement of the library	241	None	None	None
For supplies used in the clinical departments	4,903	6,910	7,393	10,929
For salaries: for administration	4,933	6,840	8,120	7,720
For salaries: for teaching	25,587	31,976	38,535	35,630
For all other purposes	9,147	9,879	10,170	12,300
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(30)	(27)	(29)	(23)
Amount of their salaries as teachers	15,887	21,726	27,785	24,880
Number of teachers of dental subjects who did not receive salaries	(20)	(15)	(14)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	1,800	3,600	4,000	4,200

¹ During the academic years 1920-24, there was no surplus, no appropriation by the State or City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

² During the academic years 1920-24, there was no payment on account of debt or rent.

DENTAL SCHOOLS IN THE UNITED STATES

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on June 30				
Smallest salary paid to a whole-time teacher of a dental subject	\$1,200	\$1,800	\$2,400	\$3,000
(Number of teachers of academic or medico-dental subjects)	(16)	(21)	(21)	(28)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	9,700	10,250	10,750	10,750
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	1,800	3,600	4,000	4,200
In the Medical School	5,000	5,000	5,000	6,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,200	1,800	2,400	3,000
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	9,700	10,250	10,750	10,750

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 51. Of this total number, 14 were whole-time, 7 half-time, and 7 part-time or occasional teachers of academic or medico-dental subjects; 6 were whole-time, 2 half-time, and 15 part-time or occasional teachers of dental subjects; 6 were whole-time teachers in the Dental School only; 17 were "full" professors; 29 were associate, assistant, or clinical professors; 5 were lecturers by title; all received salaries; 21 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.A. and D.D.S.: since 1920; now six years in length

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

STUDENTS AND GRADUATES: COLLEGE OF DENTISTRY, BAYLOR UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	145	74	92	118	138	189
Women	1	1	1	1	3	6
From other countries.....	0	0	1	0	0	0
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	188	70	91	111	131	170
Admitted after examination.....	3	3	4	4	5	5
Admitted to advanced standing.....	2	2	1	0	3	5
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	11	17	20	18	27	21
Denied further instruction because of deficient scholarship.....	7	4	1	7	7	12
GRADUATES (D.D.S.)						
Total number of graduates.....	54	9	24	12	14	23
Women	0	0	1	0	0	1
Admitted to practice in other countries.....	0	0	0	0	0	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	2	1	3	2	1	2
Percentages of failures in such state-board examinations.....	7.7	0	0	0	7.1	4.5

Research: none in progress in 1924-25; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other professional service, such as teaching or research

Visited: November, 1921; June and November, 1924

The foregoing data have been verified in detail by the Secretary and Registrar

SUMMARY

THIS School is the reorganized "State Dental College," which, although an unacceptable proprietary institution in 1918, was promptly transformed so thoroughly by the University, with the cooperation of members of the Medical Faculty, that by 1921 the School had attained a grade of Class A. It is now intimately associated with the Schools of Medicine, Nursing, and Pharmacy, and, more than any other dental school in the western half of the United States, exemplifies the advantages to dental education that accrue from the close cooperation of medical teachers, particularly through sympathetic instruction in the medico-dental sciences and in oral medicine. In 1926-27, elevation of the entrance requirement to one year of approved work in an accredited academic college will favor improvement of the medico-dental courses, by enabling the teachers of the medical sciences to bring the instruction into closer agreement in quality with that for the students of medicine. The Baylor Medical School requires its students to take formal courses in the leading medical specialties, but, despite its sympathetic cooperation with the Dental School, does not give formal instruction in any aspect of oral health-service. Dentists are not included in the Medical Faculty.

The University has not required the School to be self-supporting, but since 1918 the use of general funds from limited resources to develop the School has tended to keep teaching salaries low and the number of experienced whole-time teachers small. The Faculty has confined its attention to the undergraduate curriculum and is inactive in research. The School is urgently in need of increased resources for its proper development. With steady growth in the population of the city and state, the responsibility and opportunity of the Baylor School will rapidly increase. As one of a well-coordinated group of schools in an important centre for health service, its adequate financial support should appeal strongly to the citizens of Dallas. The geographical distribution of the students, in 1924-25, is shown in the accompanying table, where the data indicate that most of the students resided in Texas, Oklahoma, and Arkansas.

Comparative data relating to students, graduates, and results of license examinations, are given on pages 564 and 565.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT BAYLOR UNIVERSITY: 1924-25

States (11)	First year	Second year	Third year	Fourth year	Total
Arkansas	5	2	1	1	9
Kansas	0	1	0	1	2
Louisiana	3	0	0	0	3
Oklahoma	7	4	4	0	15
Texas	53	49	26	37	165
Arizona, Iowa, Kentucky, Missouri, Mississippi, Pennsylvania—one each	1	2	2	1	6
Total	69	58	33	40	200

HOUSTON

Population: 162,508. Number of dentists, 137; physicians, 342. Ratios: dentists to population, 1:1186; physicians to population, 1:475; dentists to physicians, 1:2.5
 Number of dental clinics or infirmaries, 2; hospitals, sanatoriums, and charitable institutions, 12; hospitals approved for internships, 3

Dental School: Texas Dental College

TEXAS DENTAL COLLEGE

Special note. According to the Announcement for 1925-26, the College is about to be housed in a new three-story brick building, having a floor space of 15,000 sq. ft., situated on Blodgett Boulevard at Fannin Street; distance from the centre of the city, two miles. The prospective cost of the building is \$50,000; and of the new equipment, \$10,000. The new Infirmary will have a total floor area of 2275 sq. ft., and 50 chairs. The building will be owned by members of the Faculty, who will receive an annual rental. (The School was removed to the new building in November, 1925)

Location: 1015½ Franklin Street; in the centre of the city

General character: independent and proprietary

Organized: in 1905

Building: the School, as a tenant, occupies the two upper floors in a three-story commercial building; total floor area, 5149 sq. ft.

Infirmary: with two accessory rooms; total floor area, 2084 sq. ft. Total number of chairs in active use, 18, including groups reserved for special purposes: extraction, 2; roentgenography, 1

School of Medicine: associated with none

Dispensary or Hospital in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: none

Library: none in the School; none elsewhere conveniently accessible to the dental students

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: part-time officer; also Professor of Dental Anatomy and Dental Histology. *Associate Dean* (or equivalent officer): none. *Secretary:* part-time officer; also Professor of Dental Pathology, Materia Medica, and Therapeutics

Minimum academic requirement for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (15 units), or its equivalent (since 1919). "We do not insist on high-school graduation, but encourage it"

Next prospective advance in the minimum academic requirement for admission: uncertain

Number of graduates (1907-1925): 244; average per year, for nineteen years, 13

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 63; proportion from Texas: 1922-23—88 per cent; 1923-24—83 per cent; 1924-25—80 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—300; 1921-22—460; 1922-23—650; 1923-24—1080; 1924-25—1314 (the figures for 1920-23 are estimates)

Number of visits, sittings, or operations: 1920-25—no available data

Rated Class C by the Dental Educational Council of America (July 1, 1923): last previous rating (1918), Class C

FINANCIAL DATA

Equipment: estimated value (December 31, 1924): \$18,000

General debt on the School (December 31, 1924): none

Par value of outstanding shares (80) of stock (December 31, 1924): \$4000

Accumulated net assets (December 31, 1924): \$14,000

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Surplus used during the year	None	None	None	None
Fees (all kinds) paid by the students	\$7,076	\$7,545	\$10,800	\$13,461
Fees paid by patients, in all clinical departments	690	2,000	2,079	2,865
Total amount of current income	\$7,766	\$9,545	\$12,879	\$16,326
<i>Total amount of current expenditures</i>	\$6,602	\$11,190	\$12,732	\$9,673
Surplus for the year ²	1,164	...	147	6,653
Deficit for the year	...	1,645	...	...
Dividend paid to stockholders	None	None	None	None
Accumulated surplus	None	None	None	14,000
Average amount expended by the School per student (D.D.S.) per year	140	238	193	123
Average amount of all student fees paid to the School per student (D.D.S.) per year	151	161	164	170
<i>Details of expenditures:</i> ²				
For rent	1,800	1,800	1,800	1,800
For repairs	None	4,200	1,500	None
For new equipment				
For research	None	None	None	None
For improvement of the library	No library			
For supplies used in the clinical departments	No available data			
For salaries: for administration	None	None	None	1,284
For salaries: for teaching	2,003	3,234	3,630	3,558
For all other purposes	2,799	1,956	5,802	3,031
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(6)	(9)	(11)	(12)
Amount of their salaries as teachers	1,500	2,850	3,150	3,138
Number of teachers of dental subjects who did not receive salaries	(6)	(9)	(11)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	(No whole-time teacher)			
(Number of teachers of academic or medico-dental subjects)	(7)	(9)	(9)	(14)
Amount of their salaries as teachers	503	384	480	420
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	(No whole-time teacher)			

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment, investment, or gift; no money was borrowed; and there were no miscellaneous receipts.

² During the academic years 1920-24, there was no payment on account of new construction or land. The surplus was "used to pay off a note, with interest at 8 per cent," held by a leading dental supply-house.

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 27. Of this total number, none were whole-time, 1 was a half-time, and 6 were part-time or occasional teachers of academic or medico-dental subjects; there were no whole-time, and no half-time, but 20 part-time or occasional teachers of dental subjects; a majority taught both general types of subjects; 18 were "full" professors; there were no associate, assistant, or clinical professors; 6 were lecturers by title; all received salaries; 8 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research: none in progress in 1924-25; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

STUDENTS AND GRADUATES: TEXAS DENTAL COLLEGE

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	36	64	51	54	67	82
Women.....	0	4	3	3	4	1
From other countries; chiefly from Japan and Mexico	0	1	2	3	2	5
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	33	60	47	47	66	79
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing ¹	0	0	3	2	1	2
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	No available data					
Denied further instruction because of deficient scholarship.....	0	0	0	0	0	0
GRADUATES (D.D.S.)						
Total number of graduates.....	6	26	5	4	19	19
Women.....	0	1	0	0	3	0
Admitted to practice in other countries.....	0	2	1	0	0	5
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	1	1	1	1	2	2
Percentages of failures in such state-board examinations.....	25.0	14.3	0	0	18.7	0

Visited: November, 1921

The foregoing data have been verified in detail by the Secretary

SUMMARY

THE Texas Dental College, now in its twenty-first year, is one of the three remaining proprietary dental schools in the United States. It has neither academic nor medical affiliations, and has been conducted on a very low educational plane from every point of view of fair criticism. Inferior facilities, in overcrowded rooms, without adequate laboratories or a library, in an uninviting environment, have reflected the educational tone of the School. The new building (1925-26) will remove some of these disabilities, but will also promote the School's commercial prospects. On an ascending scale of profits during the past three

¹ These returns do not agree with the facts shown on page 564.

GEOGRAPHICAL DISTRIBUTION OF THE STUDENTS AT THE TEXAS DENTAL COLLEGE: 1924-25

<i>States (8) and foreign country (1)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Arkansas	0	0	3	0	3
Japan	0	0	0	7	7
Louisiana	1	0	0	1	2
Oklahoma	0	0	3	0	3
Texas	22	15	23	14	74
California, Georgia, Mississippi, North Carolina —one each	2	1	0	1	4
Total	25	16	29	23	93

years (1922-25)—\$147, \$6653, and \$7500, respectively—salaries for administration and teaching have been trifling, yet the School now has more students than ever before. Nearly all of the members of the teaching staff are “professors,” some of whom are physicians, but no teacher gives whole-time service and there is no interest in research. The published entrance requirements have been enforced very liberally, the admissions to advanced standing have been heavily disproportionate, and during the past seven years no student has been denied further instruction because of deficient scholarship. In 1924-25 seven dentists from Japan, who were desirous of returning to their native country with an American dental degree, were admitted to the senior class and graduated in 1925.¹

The new building, by adding an air of plausibility to the pretensions of the former management and by encouraging members of the Faculty hereafter to obtain “interest on the investment,” may increase the School’s influence for harm. The School cannot be regarded as acceptable until it is reorganized on a non-proprietary basis and conducted by a competent faculty under the leadership of experienced teachers. The new building is situated near the Rice Institute and the Hermann Hospital, but affiliation of the School with either does not seem to be contemplated. The geographical distribution of the students, in 1924-25, is shown in the accompanying table. Comparative data relating to students, graduates, and results of license examinations, are given on pages 564-565.

GENERAL COMMENT

OF the four contiguous states, New Mexico, Oklahoma, and Arkansas are without a dental school, but Louisiana contains two. The merits of the growing school in Dallas make it a credit to that city and to the state. It deserves the widest public support, and its future development should deeply interest the dental and medical professions of Texas and throughout the Southwest. When a second dental school is needed in Texas, its creation in intimate association with the Medical School of the University of Texas, which now gives no formal instruction in stomatology or clinical dentistry, would seem to be the logical and desirable development.

At the top of page 564 the data for the number of students who, during the past seven years at each school, were required to repeat at least one subject or were denied further instruction because of deficient scholarship, indicate a degree of educational sincerity in the conduct of the school at Dallas that is almost completely lacking in the one at Houston.

The protection of a school as low in educational quality as the Texas Dental College has not been a credit to the State Board of Dental Examiners nor to the dental

¹ In 1921-22 there was a similar situation at the Class C Dental School of the University of West Tennessee for colored students (Memphis), where six dentists from Japan, after a year’s attendance, received the D.D.S. degree. The School was discontinued in 1923. The dentists of Japan should beware of a tendency among them to seek, in the United States, diplomas that do not represent acceptable dental training in America. It is regrettable that such diplomas are obtainable in the United States under statutory protection.

DENTAL SCHOOLS IN THE UNITED STATES

DATA RELATING TO SCHOLARSHIP AT THE TWO DENTAL SCHOOLS IN THE STATE OF TEXAS: 1918-25

Number of "repeaters" of one or more subjects

	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25
Baylor	11	17	20	18	27	21	22
Texas	"No available data"						5

Number of students denied further instruction because of deficient scholarship

Baylor	7	4	1	7	7	12	5
Texas	0	0	0	0	0	0	0

profession of Texas. The dental statute expressly provides that a prerequisite for admission to the license examination is the presentation of a "diploma from a reputable dental college," or evidence of legal practice in another state for a period of three years next preceding. The law stipulates that, to be considered reputable within the meaning of the statutory provisions, a school's entrance requirements and curriculum must be "as high as those adopted by the better class of dental colleges of the United States." The Texas Dental College has been rated Class C by the Dental Educational Council since 1918, and the School is also ineligible for admission to membership in

DATA PERTAINING TO THE TWO DENTAL SCHOOLS IN THE STATE OF TEXAS: 1919-26

Total attendance

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Baylor	70	91	111	119	158	174	178
Texas	60	47	47	67	82	93	129
Total	130	138	158	186	240	267	307

Proportion of the students resident in Texas

Baylor	84	85	87	98	96	82	83
Texas	86	94	89	88	83	80	90

Number of graduates

Baylor	9	24	12	14	23	40	30 ¹
Texas	26	5	4	19	19	23	39 ¹
Total	35	29	16	33	42	63	69

Classification of the total attendance

	First year	Second year	Third year	Fourth year	Total
Baylor: 1922-23	44	38	22	15	119
1923-24	60	42	35	21	158
1924-25	55	48	31	40	174
1925-26	61	47	40	30	178
Texas: 1922-23	23 ²	11	14	19	67
1923-24	22	27 ²	14	19	82
1924-25	25	16	29 ²	23	93
1925-26	36	35	20	38 ²	129

¹ The number of seniors (December, 1925).

² The size of most of the classes in the Houston School increased annually, as is shown typically by the class admitted in 1922-23. At Baylor the opposite has been the rule.

the American Association of Dental Schools. Nevertheless, the State Board of Dental Examiners, with full knowledge of the School's deficiencies, has permitted this important provision of the statute to become inoperative.

On page 564 the data for total attendance, proportion of Texans among the students, number of graduates, and classification of the attendance, suggest additional pertinent facts regarding the comparative values of these two schools. The total attendance at each has been increasing to its present maximum, a striking gain for 1925-26 having been shown at the Texas Dental College, where the admissions to advanced standing have evidently been much more numerous than those reported by that School for the table on page 562. Thus in 1922-23, the number in the first-year class at the Houston School was 23, but now as the fourth-year class the group has 38 members. In 1923-24 the third-year class numbered 14, but in 1924-25 as the fourth-year class it had 23 members. In 1924-25 the first-year class had 25 members, but now as the second-year class it has 35. The School has become a refuge for students who are unable to continue with credit at other institutions. The growing professional opportunities in Texas increase the School's attractiveness for incompetent students.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of the Texas schools who failed, in the number of states indicated by the figures in parenthesis:

1925.—Baylor, 10.0 (2); Texas, 13.3 (2); U. S. schools collectively, 11.3.

1910-25 (cumulative).—Texas, 17.3 (3); U. S. schools collectively, 14.2.

1919-25 (cumulative).—Baylor, 5.7 (?); U. S. schools collectively, 12.8.

UTAH

Population: 488,562. Number of dentists, 295; physicians, 505. Ratios: dentists to population, 1:1656; physicians to population, 1:967; dentists to physicians, 1:1.7

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited four-year high school, or the equivalent. Professional training: graduation from a dental school approved by the National Association of Dental Examiners.

Medicine.—Preliminary education: one year of approved work in an accredited academic college—two years, after July 1, 1926. Professional training: graduation from a reputable medical school; in addition, after July 1, 1926, one year of interne service in an approved hospital

Dental school: none; medical school: University of Utah (gives only the first two years of a four-year curriculum)

VERMONT

Population: 352,428.¹ Number of dentists, 174; physicians, 537. Ratios: dentists to population, 1:2025; physicians to population, 1:656; dentists to physicians, 1:3.1

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited high school, or the equivalent. Professional training: graduation from a reputable dental school; beginning in 1928, graduation from a dental school above the grade of Class C. *Medicine*.—Preliminary education: two years of approved

¹The figure for population is that of the census of 1920, when the total was less than in 1910. See footnote 2, page 258.

work in an accredited academic college. Professional training: graduation from a Class A medical school; in addition, at the option of the Board, one year of service as an interne in an approved hospital

Dental school: none; medical school: University of Vermont

VIRGINIA

Population: 2,436,693. Number of dentists, 674; physicians, 2534. Ratios: dentists to population, 1:3615; physicians to population, 1:962; dentists to physicians, 1:3.8

Statutory requirements. *Dentistry*.—Preliminary education: one year of approved work in an accredited academic college. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school

Location of the dental school: Richmond; medical schools (2): Charlottesville and Richmond

RICHMOND

Population: 185,063. Number of dentists, 130; physicians, 384. Ratios: dentists to population, 1:1423; physicians to population, 1:482; dentists to physicians, 1:3.0

Number of dental clinics or infirmaries, 5; hospitals, sanatoriums, and charitable institutions, 27; hospitals approved for internships, 3

Dental School: School of Dentistry, Medical College of Virginia. *Medical School*: School of Medicine, Medical College of Virginia

SCHOOL OF DENTISTRY, MEDICAL COLLEGE OF VIRGINIA

Location (main building): Twelfth and Clay Streets; six blocks from the centre of the city

General character: one of a group of associated professional schools (medicine, dentistry, pharmacy, and nursing). The College is non-proprietary and without university affiliation, but receives financial support from the State

Organized: in 1913, by union of the Virginia School of Dentistry (the Dental Department of the Medical College of Virginia) and the Department of Dentistry of the University College of Medicine, when these medical colleges were consolidated, with headquarters in the new building of the latter, and named the Medical College of Virginia. The original Medical College of Virginia was organized in 1838 as the Medical Department of Hampden-Sydney College (Richmond), which was chartered as the Medical College of Virginia in 1854; its Dental Department was established in 1898. The University College of Medicine was organized in 1893 as the College of Physicians and Surgeons (Richmond); the Department of Dentistry was included from the beginning (with medicine, pharmacy, and nursing); in 1895, the name of the College was changed to University College of Medicine

Buildings: three. The main building of the Medical College was erected in 1912; it is used by all of the Schools of the College, and contains the Dental Infirmary; floor area used by the Dental School exclusively, 6203 sq. ft. Three lecture rooms are used by all of the Schools, and one laboratory (800 sq. ft.) by the Dental School exclusively, in the

adjoining old Virginia Hospital, which, previously used as a private residence, was converted to hospital purposes in 1893, and remodeled in 1922 and 1924. A third building (two blocks from the main one), formerly that of the Medical College of Virginia, was erected in 1845 and improved in 1923 and 1924; it is used by all of the Schools. Total floor area in the three buildings, used exclusively by the Dental School, 7003 sq. ft.; used with other Schools of the Medical College, 12,600 sq. ft.

Infirmary: in the main building, with four accessory rooms; total floor area, 2432 sq. ft. Total number of chairs in active use, 42, including groups reserved for special purposes: prosthodontia, 8; extraction, 2; demonstration and examination, 1 each

Relation of the School of Medicine (Class A): all of the medico-dental subjects are taught to dental students in separate classes, in the laboratories that are used in common by all of the schools; in histology, general pathology, and dental pathology, the instruction is given by dentists. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Dispensary and Hospitals in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: Memorial Hospital (two blocks), St. Philip's Hospital for Colored Patients (two blocks), and Dispensary of the School of Medicine (old Virginia Hospital)—all owned and controlled by the Medical College

Clinical facilities in the Dispensary and Hospitals where dental students received instruction in 1924-25: complete for general surgery and oral surgery in the Hospitals, and for physical diagnosis in the Dispensary

Number of dental internships (no externships), held by an officer of the School, in the Hospitals in 1924-25: one

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: clinics in oral surgery; to teach the relationships between oral infections and systemic disorders

Library (for all the Schools; in the main building): room, 1980 sq. ft.; whole-time librarian. Contains 7463 bound and 41 unbound volumes, and 2370 pamphlets (all effectively card indexed). Of the volumes, approximately 300 relate to dental subjects

Library facilities additional to those in the main building that are conveniently accessible to dental students: Library in the State Capitol (three blocks); not in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: whole-time officer; also Professor of Clinical Dentistry, of Operative Dentistry, and of Dental Anatomy. *Associate Dean* (or equivalent officer): none. *Secretary*: whole-time officer; also Associate Professor of Operative Dentistry and of Clinical Dentistry

Minimum academic requirement for admission to the first-year class, in September, 1924: one year of approved work in an accredited academic college (since 1921)

Next prospective advance in the minimum academic requirement for admission: uncertain

Number of graduates (1914-25): 230; average per year, for twelve years, 19. (Number for the Dental Department of the University College of Medicine, 1896-1913—169; average per year, for eighteen years, 9. Number for the Virginia School of Dentistry, 1900-13—86; average per year, for fourteen years, 6)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 87; proportion from Virginia: 1922-23—80 per cent; 1923-24—78 per cent; 1924-25—91 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—2250; 1921-22—3000; 1922-23—3500; 1923-24—3125; 1924-25—1370 (the figures for 1920-23 are estimates)

Number of visits: 1920-21—7848; 1921-22—10,822; 1922-23—13,046; 1923-24—11,490; 1924-25—5480 (the figures for 1923-25 are estimates)

Number of patients treated in the Dispensary and Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-21—35; 1921-22—40; 1922-23—53; 1923-24—50; 1924-25—32

Rated Class A by the Dental Educational Council of America (June 1, 1925); last previous rating (1923), Class B

FINANCIAL DATA

Estimated value of land and buildings, \$902,235; equipment, exclusively dental, \$9443; equipment, all Schools, \$45,907; total for all of the Schools, \$948,142 (June 30, 1925). The added value of the hospital equipment is \$122,400

General debt on the School (June 30, 1925): none; on the Medical College as a whole, \$125,000 at 6 per cent interest. The School pays one-third of the annual interest

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$24,810	\$23,310	\$23,080	\$17,637
Fees paid by patients in all clinical departments	9,650	13,531	18,218	17,734
Medical College funds, additional to the income designated above:				
(a) Direct appropriation, from a fund provided by the State ²	13,930	15,960	17,430	23,167
(b) Estimated amount of miscellaneous income available to the School as an integral part of the Medical College, but not specified in the dental budget	None	None	None	None
Total amount of current income	\$48,390	\$52,801	\$58,728	\$58,538
<i>Total amount of current expenditures</i>	\$43,247	\$47,933	\$56,502	\$72,364
Surplus for the year	5,143	4,868	2,226	None
Deficit for the year	None	None	None	13,826
Amount expended for the School by the Medical College, in excess of dental income, and (except deficit for 1923-24) included in "Medical College funds," above	8,787	11,092	15,204	36,993
Average amount expended by the School per student (D.D.S.) per year	386	461	523	916
Average amount of all student fees paid to the School per student (D.D.S.) per year	222	224	214	223
<i>Details of expenditures:</i> ³				
For reduction in principal of debt	None	None	None	None
For interest on debt ²	2,315	2,416	2,634	2,272
For repairs	2,522	651	3,974	6,418
For new equipment ²				

¹ During the academic years 1920-24, there was no appropriation for the Dental School by the State directly, or by the City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

² Apportioned on the percentage of the number of dental students in the whole number of students in the Medical College.

³ During the academic years 1920-24, there was no payment on account of rent, new construction, or land.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
For research	None	None	None	None
For improvement of the library	\$423	\$593	\$483	\$533
For supplies used in the clinical departments	2,086	2,597	4,406	4,787
For salaries : for administration	2,437	2,600	2,748	3,790
For salaries : for teaching	20,054	24,444	21,415	32,328
For all other purposes	13,410	14,632	20,842	22,236
<i>Salaries for instruction :</i>				
(Number of teachers of dental subjects)	(8)	(9)	(11)	(17)
Amount of their salaries as teachers	12,352	14,946	13,512	19,838
Number of teachers of dental subjects who did not receive salaries	(3)	(4)	(3)	(6)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Associate Dean's salary)	3,600	3,600	3,600	3,600
Smallest salary paid to a whole-time teacher of a dental subject	2,000	1,500	1,500	1,500
(Number of teachers of academic or medico-dental subjects)	(10)	(10)	(14)	(14)
Amount of their salaries as teachers (including a proper allotment of medical salaries for the instruction of dental students)	7,702	9,498	7,903	12,490
Largest salary paid to a whole-time teacher of an academic or medico-dental subject :				
In the Dental School	3,000	3,000	3,000	3,600
In the Medical School	3,600	4,800	6,000	6,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,500	2,000	2,700	3,000
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the Medical College	None	None	None	None

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25 : total, 38. Of this total number, 15 were whole-time, 1 was a half-time, and 2 were part-time or occasional teachers of academic or medico-dental subjects; 3 were whole-time, 2 half-time, and 15 part-time or occasional teachers of dental subjects; 1 taught both general types of subjects; 4 were whole-time teachers in the Dental School only; 13 were "full" professors; 9 were associate professors; none were lecturers by title; 6 received no salaries; 26 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.A. and D.D.S.: in academic association with Wake Forest College (since 1917), William and Mary College (since 1923), and Richmond University (since 1924); now seven years in length

Dental extension teaching : since 1925—two-day courses of intensive study in crown and bridge work, full-denture service, roentgenography, and dental diagnosis; attendance (January): 1925—92; 1926—58

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	99	88	130	104	108	81
Women.....	3	3	3	3	0	0
From other countries.....	0	0	0	0	0	0
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	77	80	112	104	108	79
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	0	0	2	0	1	3
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	21	18	18	36	35	11
Denied further instruction because of deficient scholarship.....	4	3	0	1	0	0
GRADUATES (D.D.S.)						
Total number of graduates.....	35	4	13	18	37	37
Women.....	0	0	0	3	0	0
Admitted to practice in other countries.....	0	0	0	0	0	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	3	1	1	2	2	2
Percentages of failures in such state-board examinations.....	2.9	0	0	0	0	0

Research: none in progress in 1924-25; no publication by a teacher of a dental subject in 1924, one in 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: active coöperation with the Mouth Hygiene Division of the State Board of Health, and direct correspondence with Chambers of Commerce and other responsible local organizations in Virginia

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: February, 1922

The foregoing data have been verified in detail by the Dean

SUMMARY

This Dental School, which is one of a group of schools and hospitals that constitute an independent though non-proprietary medical college, has been intimately coördinated with the Medical School in the teaching of the medical sciences, but it has not made the most of this encouragement to integrate these sciences with the practical work, and does not give close attention to the correlations between clinical medicine and clinical dentistry. Despite the intimate physical relationship between the Medical and Dental Schools, oral health-service is not included among the specialties in the instruction of medical students. Oral surgery is given only casual attention in general surgery, although 144 hours of formal instruction in the fourth year of the medical curriculum are devoted to the eye, ear, nose, and throat, collectively. The list of the members of the Medical Faculty (1925-26) contains no name with which the degree of D.D.S. is associated.

For years the schools constituting the Medical College have had the financial support of the state. The Dental School receives a share of the annual appropriation, which gives it resources in excess of the income from fees. Owing mainly to decreasing attendance, this added financial support has not been sufficient, during the past two years, to prevent a relatively heavy annual deficit, which has been paid from general funds. In 1921, this School was among the first to require a year of approved work in an accredited academic college for admission. As a consequence, the attendance promptly decreased. It was affected

CLASSIFICATION OF THE STUDENTS AT THE SCHOOL OF DENTISTRY, MEDICAL COLLEGE OF
VIRGINIA: 1920-26

	Percentage resident in Virginia	First year	Second year	Third year	Fourth year	Total	Graduates
1920-21	78	40	40	17	15	112	13
1921-22	79	8 ¹	36	40	18	102	18
1922-23	79	22	10 ¹	40	36	108	37
1923-24	80	10 ²	19	10 ¹	40	79	37
1924-25	91	14	12 ²	19	10 ¹	55	10
1925-26	82	36 ³	7	12 ²	18	73	..

also by the loss in 1923 of the Dental Educational Council's Class A rating, which had been held by the School since 1918. In 1925 the Class A rating was restored in recognition of recent improvements in the organization, facilities, and clinical work of the School, and the number of students promptly increased. The attendance during the last six years is indicated by the data in the accompanying table.

The Dental School has lately increased the salaries for instruction, but they remain inadequate, and more whole-time teachers are needed. The attention of the Faculty has been devoted almost exclusively to the undergraduate curriculum. Despite the stimulus of a good general library — which should contain a larger number of volumes of dental import — and the suggestions that arise from the School's medical relationships, the teachers of the dental subjects have been inactive in research, in marked contrast to the activity of members of the Medical Faculty. The agreement with Richmond University, for the conduct of combined curricula, suggests the possibility of a closer association with that university, which would also encourage the development of graduate work.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of this School who failed, in the number of states indicated by the figures in parenthesis: 1925. — 11.1 (2);⁴ U. S. schools collectively, 11.3. 1910-25 (cumulative). — 7.7 (6); U. S. schools collectively, 14.2.

GENERAL COMMENT

THERE are seven dental schools in the bordering states of Maryland, Tennessee, and Kentucky, and the District of Columbia, but none in North Carolina and West Virginia. In 1924-25 the attendance at the Richmond School was confined almost wholly to Virginians. Of the 55 students, 3 were from North Carolina, 1 was from South Carolina, 1 from West Virginia, and 50 were from Virginia. The heavy dependence of the State of Virginia upon the Richmond School for leadership in dentistry suggests the desirability of more liberal financial support of the Medical College of Virginia, so that both its Medical and Dental Schools may be made fully responsive to the growing needs of the state in oral health-service. There are no public indications of a purpose to establish a dental school in the University of Virginia, where the Medical School, like most medical schools in North America, conducts no formal instruction in clinical dentistry or stomatology analogous to that on diseases of the eye, ear, nose, and throat. The University Hospital does not have a dental surgeon on

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

² The first group affected by the announcement of the Dental Educational Council's Class B rating in 1923.

³ The first group affected by the Dental Educational Council's restoration of the Class A rating in 1925.

⁴ The Dean of the School states that each of the ten members of the Class of 1925 took the Virginia license examination, and passed it, before they became applicants in any other state. Later, one failed to pass in West Virginia. See the comment on page 532 regarding the growing tendency of dental graduates to take their first license examinations in the states where they receive the professional degree.

the Staff, but has a "resident [physician] in diseases of the eye, ear, nose, and throat," and a pharmacist. In the annual Announcement of the Medical School of the University of Virginia for 1925-26, one finds, in the description of the instruction on the diseases of the eye, ear, nose, and throat, an illustration of the usual avoidance in medical schools of the domain of oral health-service. It is stated that "the class is divided into small sections and each student is taught the methods of examination and the use of the ophthalmoscope, head mirror, and of the laryngeal and post-nasal mirrors. In the clinics each patient is assigned to a student, who must take the history and keep the record of that patient. . . . Clinical cases are abundant, and during the [fourth] year the student sees and handles practically all the common diseases of the eye, ear, and upper respiratory tract." The neglect of clinical dentistry is further emphasized by the fact that a long list of the current publications available to the students in the library disregards every journal devoted to the advancement of oral health-service.¹ In the same Announcement, the description of the Out-patient Department of the Hospital does not indicate that oral maladies are included among those for which patients are treated, or on which students are given instruction.

WASHINGTON

Population: 1,467,162. Number of dentists, 1157; physicians, 1781. Ratios: dentists to population, 1: 1268; physicians to population, 1: 824; dentists to physicians, 1: 1.5
 Statutory requirements. *Dentistry*.—Preliminary education: none. Professional training: graduation from a reputable dental school authorized to award the D.D.S. degree. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a medical school above the grade of Class C; in addition, one year of interne service in an approved hospital
 Dental school: none; medical school: none

WEST VIRGINIA

Population: 1,588,637. Number of dentists, 601; physicians, 1753. Ratios: dentists to population, 1: 2643; physicians to population, 1: 906; dentists to physicians, 1: 2.9
 Statutory requirements. *Dentistry*.—Preliminary education: none. Professional training: graduation from a reputable dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a Class A medical school
 Dental school: none; medical school: University of West Virginia (gives only the first two years of a four-year curriculum)

WISCONSIN

Population: 2,785,649. Number of dentists, 1940; physicians, 2826. Ratios: dentists to population, 1: 1436; physicians to population, 1: 986; dentists to physicians, 1: 1.5

¹ The disregard for dental journals in most medical schools is due in large degree to the prevailing opinion that these journals are mainly trade magazines.

Statutory requirements. *Dentistry*.—Preliminary education: graduation from a four-year accredited high school, or the equivalent in at least 16 units of college entrance credits. Professional training: graduation from an approved dental school. *Medicine*.—Preliminary education: two years of approved work in an accredited academic college. Professional training: graduation from a reputable medical school having a four-year curriculum, each year of which is at least eight months in length. Location of the dental school: Milwaukee; medical schools (2): Madison and Milwaukee

MILWAUKEE

Population: 497,946. Number of dentists, 530; physicians, 742. Ratios: dentists to population, 1:940; physicians to population, 1:671; dentists to physicians, 1:1.4. Number of dental clinics or infirmaries, 4; hospitals, sanatoriums, and charitable institutions, 31; hospitals approved for internships, 6. *Dental School*: Marquette University. *Medical School*: Marquette University

DENTAL SCHOOL, MARQUETTE UNIVERSITY

Location (new dental building): on the main site of the University; one mile from the centre of the city

General character: integral part of Marquette University

Organized: in 1912. The School was developed from the Dental Department of the Milwaukee Medical College (1894–1912). In 1907, Marquette University was formed by an affiliation between Marquette College and the Milwaukee Medical College. In 1912, the Dental Department of the affiliated Milwaukee Medical College and the Dental Department of the Wisconsin College of Physicians and Surgeons (1899–1912) were united in the Dental School

Buildings: three. A rented building (old Milwaukee Medical College, Trinity Hospital, erected in 1897) was occupied by the School until 1922; only anatomy and oral surgery are taught there at present; total floor area now used by the School, 11,705 sq. ft. This building is three-fourths of a mile from the new dental building. Bacteriology, histology, and pathology are taught in a special laboratory (2000 sq. ft.) in the new Science Building, which has been in use since September, 1924, where the dental students also share the facilities of the laboratories for physics, chemistry, botany, and zoölogy with the students of the College of Liberal Arts. The large new dental building has been in use since September, 1922, for instruction in dental technology and clinical dentistry; total floor area, 50,514 sq. ft. Total floor area in the three buildings used by the Dental School, 64,219 sq. ft.

Infirmary: in the new dental building, with seventeen accessory rooms; total floor area, 14,730 sq. ft. Total number of chairs in active use, 167, including groups reserved for special purposes: prosthodontia, 10; extraction, 3; examination, 2; demonstration, 1

Relation of the School of Medicine (Class A): situated one and one-fourth miles from the new dental building; too remote for practical coöperation in the instruction of dental students in the medico-dental subjects. The University is endeavoring to obtain funds sufficient to enable it to rebuild the Medical School in the immediate vicinity of the new dental building, and there to create a centre for health-service education in all its divisions. In 1924–25, teachers of medical subjects did not give dental students instruction in clinical medicine; one teacher of a dental subject gave medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction in 1924-25: Marquette University ("Trinity") Hospital (three-fourths of a mile from the new dental building)

Clinical facilities in the Hospital where dental students received instruction in 1924-25: complete for general surgery and oral surgery

Number of dental internships or externships in the Hospital, in 1924-25: none

Nature and specific purpose of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: lectures and clinics for seniors; to teach oral surgery under the conditions that prevail in a good hospital

Library (in the new dental building): room, 400 sq. ft.; whole-time librarian. Contains 1550 bound and no unbound volumes, and no pamphlets (all effectively card indexed). Of the volumes, approximately 1500 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: University Library (three blocks from the new dental building), and the Milwaukee Public Library, science room (adjacent to the old dental building)

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: half-time officer in the Dental School; also Professor of Operative Dentistry, and Business Manager of the University. (First President of the American Association of Dental Schools, 1923-24.) *Associate Dean* (or equivalent officer): none. *Secretary*: whole-time officer; also Instructor in Dental History and Supervisor of Senior Theses

Minimum academic requirement for admission to the first-year class, in September, 1924: graduation from an accredited high school or academy (15 units), or its equivalent (since 1913)

Latest advance in the minimum academic requirement for admission: two years of approved work in an accredited academic college, beginning in September, 1925

In September, 1925, the School began to reorganize its program of studies to combine a two-year curriculum in academic subjects with a three-year curriculum in professional work, leading to the B.S. degree at the end of the fourth year of the combined curricula and D.D.S. at the end of the fifth year. Optional full-year graduate curricula, leading to the M.S. or Ph.D. degree, are included in this program

Number of graduates (1913-25): 1037; average per year, for thirteen years, 80. (Number for the Dental Department of the Milwaukee Medical College, 1895-1912—513; average, per year, for eighteen years, 28. Number for the Dental Department of the Wisconsin College of Physicians and Surgeons, 1900-12—50; average, per year, for thirteen years, 4)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 422; proportion from Wisconsin: 1922-23—75 per cent; 1923-24—74 per cent; 1924-25—68 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—8436; 1921-22—9745; 1922-23—11,761; 1923-24—15,084; 1924-25—17,822

Number of visits: 1920-21—40,000; 1921-22—45,000; 1922-23—55,000; 1923-24—73,716; 1924-25—85,006 (the figures for 1920-23 are estimates)

Number of patients treated in the Hospital, by dental students under the supervision of representatives of the Dental School: 1920-25—none

Rated Class A by the Dental Educational Council of America (July 1, 1923); last previous rating (1918), Class A

FINANCIAL DATA

Estimated value (Dental School) of land and buildings, \$330,000, and equipment, \$115,000; total, \$445,000 (July 31, 1925)

General debt on the School, or carried by the University on the School's account (July 31, 1925): \$200,000 at 7 per cent, and \$75,000 at 6.5 per cent interest per annum

	(1)	(2)	(3)	(4)
Data for years ending on July 31	1920-21	1921-22	1922-23	1923-24
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$96,348	\$119,781	\$135,328	\$141,072
Fees paid by patients, in all clinical departments	19,792	30,677	43,642	71,104
Gifts	1,500	1,500	1,500	1,500
University funds, additional to the income designated above:				
(a) Direct appropriation	6,675	None ²	None ²	None ²
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	5,000	5,000	5,000	5,000
Total amount of current income	<u>\$129,315</u>	<u>\$156,958</u>	<u>\$185,470</u>	<u>\$218,676</u>
<i>Total amount of current expenditures</i>	\$129,315	\$156,958	\$185,470	\$196,370
Surplus for the year, received by the University	None	None	None	22,306
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	11,675	5,000	5,000	None
<i>Capital expenditures</i> (additional), by the University: ³				
For the new building	None	\$88,442 ³	\$113,588 ³	\$28,344
For new equipment	None	None	55,303 ³	None
Total	<u>None</u>	<u>\$88,442</u>	<u>\$168,891</u>	<u>\$28,344</u>
Average amount expended by the School per student (D.D.S.) per year	279	279	308	342
Average amount of all student fees paid to the School per student (D.D.S.) per year	208	213	225	245
<i>Details of current expenditures:</i>				
For reduction in principal of debt	None	None	None	None
For interest on debt	363	14,000	18,875	18,875
For rent (old dental building) ⁴	3,550	3,550	9,125	5,634
For repairs	5,322	3,744	3,727	2,056
For new equipment	None	4,134	29,244	1,527
For new construction (or land or both)	25,266 ⁵	28,146	None	2,229
For research	None	None	None	None
For improvement of the library	363	41	87	876
For supplies used in the clinical departments	7,187	13,198	17,257	21,386
For salaries: for administration	8,245	9,155	9,012	11,585
For salaries: for teaching	44,000	47,000	55,000	61,075
For all other purposes	35,019	33,990	43,143	71,127

¹ During the academic years 1920-24, there was no appropriation by the State or City, and no income from endowment; no money was borrowed; and there were no miscellaneous receipts. See footnote 3.

² See "Capital expenditures," below.

³ These payments are included in the recorded amount of the School's indebtedness to the University.

⁴ This building was not owned by the University.

⁵ Paid for land.

DENTAL SCHOOLS IN THE UNITED STATES

	(1)	(2)	(3)	(4)
Data for years ending on July 31	1920-21	1921-22	1922-23	1923-24
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(30)	(33)	(38)	(39)
Amount of their salaries as teachers	\$24,000	\$24,000	\$30,640	\$38,153
Number of teachers of dental subjects who did not receive salaries	(2)	(3)	(4)	(3)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	3,300	3,600	3,600	3,850
Smallest salary paid to a whole-time teacher of a dental subject	2,700	1,200	1,200	1,200
(Number of teachers of academic or medico-dental subjects)	(25)	(26)	(23)	(22)
Amount of their salaries as teachers (including a proper allotment of university salaries for the instruction of dental students)	20,000	23,000	24,360	22,922
Largest salary paid to a whole-time teacher of an academic or medico-dental subject:				
In the Dental School	2,400	3,480	3,480	3,600
In the Medical School	4,000	4,500	4,500	4,500
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	2,100	2,400	2,400	2,000
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University (the "allotment" referred to above)	None	None	None	None
Salary value of the teaching by Jesuits without expense to the School (included in "Gifts" and "Total expenditures," above)	1,500	1,500	1,500	1,500

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 56. Of this total number, 6 were whole-time, 2 half-time, and 11 part-time or occasional teachers of academic or medico-dental subjects; 9 were whole-time, 1 was a half-time, and 27 were part-time or occasional teachers of dental subjects; 9 were whole-time teachers in the Dental School only; 17 were "full" professors; 13 were associate or assistant professors; none were lecturers by title; 3 received no salaries; 18 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Combined curricula leading to the degrees of B.S. and D.D.S.: since 1921; now six years in length

Course for dental hygienists: since 1923; attendance: 1923-24—17; 1924-25—15

Graduate courses in dentistry (full-year graduate curricula leading to the degree of M.S. or Ph.D.): since 1924; attendance: 1924-25—1

Advanced courses for dental practitioners: since 1918; attendance: 1921-22—32; 1922-23—18; 1923-24—13; 1924-25—none

Summer courses in clinical dentistry (June, July, August, and September): since 1910; attendance: 1922—24; 1923—48; 1924—75; 1925—60

Dental extension teaching: lectures and clinics, since 1919; attendance: 1921-22—250; 1922-23—250; 1923-24—250; 1924-25—150 (these figures are close estimates)

No course for dental mechanics, assistants, or technicians

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	317	305	471	574	613	590
Women	1	1	1	4	6	7
From other countries; chiefly European.....	1	2	4	5	6	4
Negroes.....	0	2	1	1	3	4
Attendance at the end of the year.....	287	298	464	563	602	575
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	3	2	4	6	12	7
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	19	5	15	12	17	18
Denied further instruction because of deficient scholarship.....	10	5	8	6	9	6
GRADUATES (D.D.S.)						
Total number of graduates.....	137	0	48	75	125	160
Women	0	..	0	1	0	0
Admitted to practice in other countries.....	0	..	0	1	0	1
Negroes.....	0	..	0	1	1	0
	1919	1920	1921	1922	1923	1924
Number of states in which graduates took their first license examinations.....	6	..	3	5	7	8
Percentages of failures in such state-board examinations.....	10.0	..	2.1	2.7	1.6	5.1

Research: actively in progress in 1924-25, on temporo-mandibular abnormalities resulting from loss of teeth; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service, but all applications for dentists received by the School are presented to the seniors

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: March, 1922; March, 1925

The foregoing data have been verified in detail by the Dean

SUMMARY

DURING the past few years this School has been rejuvenated both in body and in spirit. It occupies a new building and is intimately associated with the improved Academic College. Although its work has been conducted without help from the Medical School, and the instruction in the correlations between clinical dentistry and clinical medicine has been weak as a consequence, the Dental Faculty cordially supports the plan of the University to rebuild the Medical School adjacent to the Dental School, and closely to coordinate the two Schools in a modern centre for health-service education, as soon as funds adequate for the purpose can be obtained. The Marquette Medical School is one of the few in the United States that recognize the importance of oral health-service. The students of medicine, in the third year, are given a required lecture course of 16 hours in stomatology by a Lecturer on Stomatology, who is Professor of Oral Surgery in the Dental School and also a member of the Medical Faculty. This Dental School is the only one of those associated with medical schools of which it can be said that its needs have been given precedence over those of the medical school. Because of the favorable location and adaptability of its new building, it is also the only dental school in a university about which a complete modern centre for health service could be developed economically and advantageously from institutions to be created, or which require rebuilding.

The recent history of this School illustrates the financial embarrassment under which most of the university dental schools have been laboring, and also the inevitable procedures

DENTAL SCHOOLS IN THE UNITED STATES

NUMBER OF DENTAL STUDENTS AT MARQUETTE WHO, BECAUSE OF DEFICIENT SCHOLARSHIP, WERE OBLIGED TO REPEAT COURSES OR TO DISCONTINUE: 1918-25

	1918-19	1919-20	1920-21	1921-22 ¹	1922-23 ¹	1923-24	1924-25
"Repeaters"	19	5	15	12	17	18	14
Discontinued	10	5	8	6	9	6	10
Total maximum attendance	317	305	471	574	613	590	580

when, facilities being inadequate and the required resources deficient, it is desirable in the public interest, regardless of the educational disabilities that temporarily ensue, to conduct necessary developments on borrowed funds to be repaid either from prospective gifts or from net income. The heavy debt incurred for the erection of the new building, and the ensuing annual payment of interest, which must be taken from current income until gifts to the University remove this load, have been keeping salaries inadequate, the number of whole-time teachers small, and the School inactive in research. The University needs special funds sufficient to enable it to liquidate the debt, and to give the School the means that its educational opportunity and the full expression of its value in oral health-service to the city require. In anticipation of a growth of public support for these purposes, a good library is being actively developed, research has been initiated, and a complete program of instruction in dentistry, including full-year graduate curricula (page 139), has been undertaken. The School deserves the sympathetic concern of the citizens of Milwaukee, to whom the University's desire and opportunity to develop a complete centre for community health service should appeal irresistibly.

The relatively large number of students who were obliged to repeat courses, or to discontinue because of deficient scholarship, indicates a degree of educational sincerity that has not been impaired by the recent need for a surplus in the conduct of the School.

The geographical distribution of the students, in 1924-25, is indicated in the accompanying table, where the data show that while most of the students resided in Wisconsin (68 per cent), relatively large numbers were drawn from Michigan, Minnesota, North Dakota, Illinois, and Iowa.

A classification of the total number of undergraduates in 1924-25 and 1925-26 (Decem-

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT MARQUETTE UNIVERSITY: 1924-25

States (22), territory (1), and foreign countries (4)	First year	Second year	Third year	Fourth year	Total
Illinois	8	1	3	4	16
Indiana	2	0	2	0	4
Iowa	5	3	5	0	13
Michigan	21	8	14	13	56
Minnesota	7	9	13	11	40
Montana	3	1	0	1	5
New York	2	1	0	2	5
North Dakota	5	3	4	7	19
Ohio	0	0	1	2	3
South Dakota	4	0	2	0	6
Wisconsin	108	88	87	107	390
Alabama, Alaska, Costa Rica, Florida, Guatemala, Kansas, Korea, Massachusetts, Missouri, New Jersey, Roumania, Tennessee, Washington, Wyoming — one each	6	3	1	4	14
Connecticut, Pennsylvania — two each	4	0	0	0	4
Total	175	117	132	151	575
Number from Wisconsin	108	88	87	107	390
Number not resident in Wisconsin	67	29	45	44	185

¹ Heavy payments were made in 1921-23 for the construction and equipment of the new building.

CLASSIFICATION OF THE DENTAL UNDERGRADUATES AT MARQUETTE — TWO CURRICULA : 1924-26

Curriculum	Year	Academic years		Professional years				Total
		First	Second	First	Second	Third	Fourth	
The "0-4 plan" ¹	1924-25	...	...	159	115	130	149	553
	1925-26	...	...	...¹	144	121	121	386 ²
New "2-3-graduate plan"	1925-26	59 ³	16 ³	7 ⁴	...	...⁵	... ⁵	82 ²

ber) shows the presence in the Academic College of a surprisingly large number who have elected a two-year academic preparation.

The last official record of the annual results of the license examinations includes these comparative data for percentage of the graduates of this School who failed, in the number of states indicated by the figures in parenthesis: 1925.—7.2 (11); U. S. schools collectively, 11.3. 1910-25 (cumulative).—7.2 (18); U. S. schools collectively, 14.2.

GENERAL COMMENT

IN Michigan, Illinois, Iowa, and Minnesota, the four states immediately adjacent to Wisconsin, there are six dental schools—four of them in state universities—but the Marquette School continues to supply most of the new dentists in Wisconsin and to train an increasing number of students from other states. The recent service of the School to the State of Wisconsin may be estimated from the data on page 580. The ability of Marquette to continue to promote the oral health of Wisconsin will depend upon the financial means available for the purpose. The University's opportunity to extend this service should greatly interest not only the local friends of Marquette, but also the people of the entire state.

The University of Wisconsin has been inactive in dental education. It has had a Medical School since 1907 but, until 1925-26, offered only the first two years of the conventional medical curriculum. In 1920, the Legislature authorized the establishment, at the University, of the Wisconsin General Hospital as a memorial to those who served in the World War, and for the care of patients, for teaching, and for research. The new hospital building was opened in October, 1924. Affiliated with the Hospital, under the control of the University, are the Student Infirmary, the Bradley Memorial Hospital (for early neuro-psychiatric patients), and the Wisconsin Psychiatric Institute. The creation of the Hospital having made it possible for the University to expand the work of the Medical School, the medical curriculum has been lengthened to four years, the third of which is now being given (1925-26). The first students will graduate in 1927. The Announcement for 1925-26 indicates that neither clinical dentistry nor stomatology has attained recognition as a mode of health service. All of the subjects in the conventional medical curriculum are represented in the Faculty, but oral health-service is not. The clinical staff has a professor of plastic surgery who, from 1898 to 1902, was dean of the Dental Department of the Milwaukee Medical

¹ In 1925 no students were admitted to the first year on the "0-4 plan," which will be discontinued with the graduation of the class of 1928.

² The present total attendance (December, 1925), including all of the students on both plans, is 468.

³ These students are now primarily registered in the Academic College of Marquette University, as avowed prospective students of dentistry. In 1926-27, qualified students from other academic colleges will be admissible to the second academic year and to the first year of the three-year professional curriculum; and the usual rules on admission to advanced standing will apply to all of the professional years on both plans.

⁴ Includes students who are repeating the year and students who were able to meet the entrance requirement of two years of approved work in an accredited academic college.

⁵ On this plan, the degree of D.D.S. will be given at the end of the third professional year.

DATA PERTAINING TO THE DENTAL SCHOOL OF MARQUETTE

	UNIVERSITY: 1918-26							
	1918-19	1919-20	1920-21 ¹	1921-22	1922-23	1923-24	1924-25	1925-26
Total attendance	287	298	464	563	602	575	553	468
Proportion of students resident in Wisconsin	80	81	82	77	75	74	68	69
First-year students	95	160	184	161	138	129	159	59 ²
Graduates	137	0 ³	48	75	125	160	141	121 ⁴
Percentage of graduates who failed in state-board examinations	10.0	...	2.1	2.7	1.6	5.1	7.2	...

College, from 1902 to 1905 was a lecturer on oral surgery in four dental schools, and from 1905 to 1910 was professor of oral surgery and oral pathology in one of these four schools, but his present duties on the Medical Staff of the Hospital are performed in the Section of Orthopedics and Plastic Surgery of the Department of Surgery. The only course offered under orthopedics and plastic surgery is entitled "Orthopedics" (16 hours, second semester, third year). Although there are no dental surgeons or dental hygienists on the Hospital Staff, among the "other officers" are a pharmacist, a dietitian, and an anesthetist. Diseases of the eye, ear, nose, and throat have their representatives, not only in the Faculty and on the Hospital Staff, but also in the "Medical Extension Division," where, however, oral health-service has none. In the same Announcement, a list of eight specialties in the third-year curriculum, to each of which are allotted 16 or 32 hours, includes the conventional subjects; and one turns to it in the expectation that if a subject of possible instruction does not appear anywhere else, it will be found here. But again oral health-service is missing, and there are no suggestions of attention to it in any part of the curriculum.

WYOMING

Population: 219,347. Number of dentists, 118; physicians, 255. Ratios: dentists to population, 1:1859; physicians to population, 1:860; dentists to physicians, 1:2.2

Statutory requirements. *Dentistry*.—Preliminary education: graduation from an accredited high school. Professional training: graduation from a reputable dental school, with the D.D.S. or D.M.D. degree. *Medicine*.—Preliminary education: graduation from an accredited high school or the equivalent. Professional training: graduation from a medical school that is acceptable to the State Board of Health or to the Board of Examiners of the State in which it is located

Dental school: none; medical school: none

¹ The first year with four classes after the lengthening of the curriculum from three years to four years in 1917-18.

² The first group affected by the present entrance requirement of two years of approved work in an accredited academic college.

³ There were no graduates in 1919-20 owing to the lengthening of the curriculum from three years to four years in 1917-18.

⁴ The number of seniors (December, 1925).

SECTION A

GENERAL REGULATIONS

ARTICLE I

Whereas the Department of Health, Education and Welfare has the honor to announce that it has received from the Government of the Province of Ontario a copy of the Ontario Dental Act, 1967, and that the Department is pleased to advise that the Act has been brought into force and that the regulations made thereunder are hereby published for general information.

SECTION B

DENTAL SCHOOLS IN CANADA

Table 1. List of dental schools in Canada, 1967-68.

Province	Name of School	Year of Establishment	Number of Students	Number of Graduates
Alberta	University of Alberta	1912	100	100
British Columbia	University of British Columbia	1915	100	100
Manitoba	University of Manitoba	1912	100	100
Ontario	University of Toronto	1827	100	100
Quebec	Université de Montréal	1827	100	100
Saskatchewan	University of Saskatchewan	1907	100	100
Atlantic Provinces	Various	1827-1912	100	100

THE DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

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CHAPTER I
 THE EARLY HISTORY OF THE UNITED STATES
 FROM 1492 TO 1776

The first European settlement in North America was established by Christopher Columbus in 1492. He discovered the continent of America on October 12, 1492, while sailing westward from Europe in search of a shorter route to the Indies. Columbus's discovery opened the way for European exploration and settlement in North America.

The first permanent European settlement in North America was established by Spanish explorer Juan Ponce de Leon in 1565. He founded St. Augustine, Florida, which is the oldest continuously inhabited European settlement in the United States.

The Pilgrims, a group of English separatists, established the Plymouth Colony in 1620. They arrived on the Mayflower and spent the winter of 1620-1621 in a harsh and unfamiliar environment. Despite the difficulties, they survived and established a permanent settlement.

The Virginia Company established the first permanent English settlement in North America, Jamestown, in 1607. The colony was founded as a commercial venture and initially struggled due to lack of food and shelter. However, the discovery of tobacco as a cash crop led to the colony's growth and success.

CHAPTER II

THE GROWTH OF THE COLONIES
 FROM 1607 TO 1776

The colonies grew rapidly during the 17th century. The population increased significantly, and the colonies became more self-sufficient. The economy diversified beyond agriculture, with the development of trade and commerce. The colonies also developed a sense of identity and self-governance.

The colonies' relationship with Great Britain became increasingly strained. The British government imposed a series of taxes and regulations on the colonies, which they viewed as unfair and oppressive. The colonies demanded greater autonomy and the right to self-governance.

The American Revolution broke out in 1775. The colonists fought for independence from British rule. The war ended in 1781 with the British surrender at Yorktown. The United States Declaration of Independence was signed on September 17, 1776, marking the birth of the United States of America.

The United States continued to expand westward, and the nation grew in size and population. The American Revolution established the United States as an independent nation and a model of a republic. The new nation faced many challenges, but it persevered and emerged as a powerful and influential country.

SECTION B

DENTAL SCHOOLS IN CANADA¹

ALBERTA

Population: 651,700. Number of dentists, 202; physicians, 562. Ratios: dentists to population, 1: 3226; physicians to population, 1: 1160; dentists to physicians, 1: 2.8

Statutory requirements. *Dentistry*.—Preliminary education: three years of high-school work (21 courses), the basis for admission to the academic college of the University of Alberta. Professional training: graduation from a dental school having a five-year curriculum (one pre-dental year and four professional years, on the Canadian plan), or membership in a dental association, accredited by the University of Alberta, the official provincial examining body. *Medicine*.—Preliminary education: equivalent to that for admission to the Academic College of the University of Alberta, and in addition one year of work in that College or the equivalent. Professional training: graduation from a medical school having a six-year curriculum (one pre-medical year and five professional years), or the equivalent on the Canadian plan, as determined by the University of Alberta, subject to the rights and powers of the Provincial Medical Council

Location of the dental school: Edmonton; medical school: Edmonton

EDMONTON

Population: 65,378.² Number of dentists, 57; physicians, 139. Ratios: dentists to population, 1: 1147; physicians to population, 1: 470; dentists to physicians, 1: 2.4

Number of dental clinics or infirmaries, 1; hospitals, sanatoriums, and charitable institutions, 5; hospitals approved for internships, 1

Dental School: University of Alberta. *Medical School*: University of Alberta

DEPARTMENT OF DENTISTRY, FACULTY OF MEDICINE, UNIVERSITY OF ALBERTA

Special note. This School, which heretofore has given pre-clinical instruction only, added the clinical years to its curriculum, beginning in 1925-26. It is expected that the first class will be graduated in 1927

Location (medical building): on the site of the University, one and one-fourth miles from the centre of the city

General character: a department under the Faculty of Medicine, which is an integral part of the University of Alberta. The curriculum leading to the degree (D.D.S.) is arranged on the basis of a five-year program (one pre-dental, two pre-clinical, and two clinical), of which the work of only the first two or three years has been offered (two years, 1918-23; three years, 1921-25). By special arrangement with the Faculties concerned, students who *completed* the pre-clinical curriculum here have been admitted to corresponding advanced standing in the Schools of Dentistry of the Royal College of Dental

¹ The territories contain no dental schools, and have not been included. See the footnotes on page 257 and the last footnote on page 258.

² The present writer is indebted to Dean Allan C. Rankin of the Medical School for the estimate of the population of Edmonton as of June 1, 1925.

Surgeons of Ontario, and of McGill University, which have awarded the degree. See "Special note," on page 583

Organized: in 1918. Occupies seven rooms in the new medical building

Building: erected in 1921; total floor area of the seven rooms used for the special instruction of dental students, 3231 sq. ft.

Infirmery (beginning in 1925-26): in the medical building, with two accessory rooms; total floor area, 1376 sq. ft. Total number of chairs in active use, 11, including groups reserved for special purposes: prosthodontia, 2; examination and extraction, 1 each

Relation of the School of Medicine: the medico-dental subjects are taught by the Faculty of Medicine; in some subjects, to medical and dental students in the same classes. In 1924-25, teachers of dental subjects did not give medical students instruction in clinical dentistry

Hospital in which dental students received accredited instruction in 1924-25: none. Adequate facilities in the University Hospital will be available for the instruction of dental students, after the addition of the fifth year to the curriculum

Library (primarily, medical): room, 1173 sq. ft.; whole-time librarian. Contains 1600 bound and 250 unbound volumes, and 3816 pamphlets (all effectively card indexed). Of the volumes, approximately 60 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: University Library; in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean of the Department of Dentistry: none. *Dean of the Faculty of Medicine*: whole-time officer; also Professor of Bacteriology and Hygiene, and Director of the Provincial Laboratory. *Associate Dean* (for medicine or dentistry): none. *Dean's executive assistant* in Dentistry: Head of the Department of Dentistry; part-time officer and Lecturer in Operative Dentistry

Minimum academic requirement for admission to the first of the three classes, in October, 1924: ordinary university matriculation, as in the Faculty of Arts, plus Latin and a modern language. "The work of the first year is a pre-dental year of college work, largely general science" (since 1921)

Next prospective advance in the minimum academic requirement for admission: uncertain

Number of graduates: none. See "General character," on page 583

Average total attendance, per year (at the end of the year), for the past seven years (1919-25), 29; proportion from Alberta: 1922-23—68 per cent; 1923-24—69 per cent; 1924-25—47 per cent

Clinical service of the Dental School in the instruction of students: none; see "General character," on page 583

FINANCIAL DATA¹

Estimated value of the equipment used solely for instruction in dentistry (December 31, 1925): \$7200. The total value of the new medical building and its equipment is approximately \$1,250,000

General debt on the Department, or carried by the University on the Department's account (June 30, 1925): none

¹ Where exact figures are not available, because the records do not always distinguish dental students from medical students, close estimates have been recorded.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21 ¹	1921-22	1922-23	1923-24
<i>Current income:</i> ²				
Fees (all kinds) paid by the students	\$2,932	\$2,150	\$5,150	\$3,900
Fees paid by patients	(No clinical instruction during this period)			
University funds, additional to the income designated above:				
(a) Direct appropriation	1,025	1,073	1,739	1,800
(b) Estimated amount of miscellaneous income available to the Department as an integral part of the University, but not specified in the dental budget	15,043	16,350	17,350	18,600
Total amount of current income	\$19,000	\$19,573	\$24,239	\$24,300
<i>Total amount of current expenditures</i>				
Amount expended for the Department by the University, in excess of dental income, and included in "University funds," above	16,068	17,423	19,089	20,400
Average amount expended by the Department per student per year	514	515	551	900
Average amount of all student fees paid to the Department per student per year	79	57	117	144
<i>Details of expenditures:</i> ³				
For repairs	1,900	4,218	62	181
For new equipment				
For research	None	None	None	None
For the dental section in the library	None	None	None	None
For salaries: for administration	1,200	1,200	1,200	1,200
For salaries: for teaching	13,600	14,000	16,000	16,000
For all other purposes	2,300	155	6,977	6,919
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(2)	(2)	(2)	(2)
Amount of their salaries as teachers	3,000	3,000	4,000	4,000
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject	(No whole-time teachers of dental subjects)			
(Number of teachers of academic or medico-dental subjects to dental students and medical students, in the same classes in some subjects)	(40)	(40)	(40)	(42)
Amount of their salaries as teachers	(84,000)	(84,000)	(84,000)	(84,000)
Largest salary paid to a whole-time teacher of an academic or medico-dental subject ⁴	(4,000)	(4,500)	(4,500)	(4,500)
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	(1,500)	(1,500)	(1,500)	(1,500)
Estimated proportionate share for the Dental Department of the salaries of these teachers of dental students (not included in the dental budget, but paid by the University or from the medical budget)	10,600	11,000	12,000	12,000

¹ The financial data for 1920-21 are close approximations; actual figures are not available.

² During the academic years 1920-24, there was no surplus, no dental appropriation by the Province or City, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts.

³ During the academic years 1920-24, there was no payment on account of debt, rent, new construction, or land.

⁴ There were no whole-time teachers of academic or medico-dental subjects to dental students only.

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 44. Of this total number, 12 were whole-time, 2 half-time, and 28 part-time or occasional teachers of academic or medico-dental subjects; none were whole-time, 2 half-time, and none part-time or occasional teachers of dental subjects; none were whole-time teachers in the Dental Department only; 6 were "full" professors; 6 were associate or assistant professors; 6 were lecturers by title; all received salaries; 40 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

STUDENTS

Total number of students in each year	1918-19	1919-20	1920-21	1921-22 ¹	1922-23 ¹	1923-24
	Two-year course (two pre-clinical)			Three-year course (one pre- dental; two pre-clinical)		
PRE-CLINICAL YEARS ONLY; NO GRADUATES						
Maximum attendance.....	3	24	39	40	44	34
Women.....	0	1	1	0	0	0
From countries other than Canada.....	0	0	0	0	0	0
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	5	24	37	38	44	27
Admitted by certificate ²	0	0	0	0	0	0
Admitted to advanced standing.....	0	0	1	1	2	0
From countries other than Canada, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	0	0	8	5	3	3
Denied further instruction because of deficient scholarship.....	0	0	0	2	0	0
Number admitted to advanced standing in the dental schools of:						
Dalhousie University.....	0	0	0	0	0	0
McGill University.....	0	0	1	0	8	0
Montreal University.....	0	0	0	0	0	0
Royal College of Dental Surgeons of Ontario (Toronto University).....	0	0	5	8	3	3
United States of America.....	0	0	0	1	3	1
Total number admitted to advanced standing in other dental schools.....	0	0	6	9	14	4

Combined curricula leading to the degrees of B.S. or B.A., and D.D.S.: since 1924; now seven years (B.S.) and eight years (B.A.) in length, including the two clinical years in another dental school (see "General character," above)

No course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in dentistry; no dental extension teaching

Research: none by teachers of dental subjects in 1924-25; no publication in 1924 or 1925

Visited: April, 1922

The foregoing data have been verified in detail by the Dean of the Faculty of Medicine

SUMMARY

For a few years this School was the only one in North America that confined its attention to the non-clinical aspects of the conventional undergraduate curriculum in dentistry. The addition of the clinical years, beginning in 1925-26, has enabled the School to conduct a complete training for the practice of dentistry. Although the preliminary education of the medical students is farther advanced than that of the dental students,³ both groups

¹ In 1921-22 there were two first-year classes on two different curricula; in 1922-23, two second-year classes on two different curricula. See "General character," above.

² "All students are admitted on examination by the Joint Board of the Provincial Department of Education and the University, or on its equivalent by other Canadian Departments of Education."

³ Students are admitted to the five-year dental curriculum on the basis of ordinary university matriculation, that is to say, twenty-one courses as offered in three years of high-school work, or the equivalent as determined by the

MEDICAL AND DENTAL CURRICULA IN THE SECOND (FIRST PROFESSIONAL) YEAR, AT THE
 UNIVERSITY OF ALBERTA: 1925-26

MEDICINE				DENTISTRY			
Subjects	Number of course	Hours per week		Subjects	Number of course	Hours per week	
		First semester	Second semester			First semester	Second semester
Gross anatomy (body wall and thorax)	4	14	..	Gross anatomy (thorax)	20	4	..
Gross anatomy (abdomen, pelvis, extremities)	2, 5	..	12	Gross anatomy (abdomen, pelvis)	22	..	7
Histology	10	7	..	Histology ¹	11	7	..
Organic chemistry	3	3	6	Organic chemistry ²	3	3	6
Splanchnology	12	..	10	Physiology ³	41	6	6
Embryology, human				14	5	..	Dental anatomy (odontology)	6, 8	6	4
Embryology, general	3	5	..	Prosthetic dentistry	1	6	6
Bacteriology	1	4	..	Physical education	2	1	1
Materia medica	3	1	1	Total	9 ⁴	33	30
Total	10 ⁴	34	29				

receive instruction together in the academic subjects common to the first year of each curriculum. In most of the medical sciences, however, the instruction is different for each group of students. In the dental curriculum, dental technology is included with medical sciences in the second and third pre-clinical years.

The Medical Faculty, in its control of the Dental School, has not assumed that dentistry can be taught most effectually by superimposing a short curriculum in dental technology and clinical dentistry upon a conventional pre-clinical curriculum in medicine. On the contrary, the Faculty has wisely concluded that although the instruction in medicine and in dentistry should be closely similar in scope and quality, the teaching should also be adapted to the needs of the respective types of general practitioners. This important difference between the medical and dental curricula for 1925-26 is illustrated by the accompanying schedules for the second (first professional) years, where the two curricula show their initial divergence. Of the courses in the second year of the dental curriculum (first professional year), only two are identical with courses in the medical curriculum for the same year, or closely similar to them. One of these is an academic science (organic chemistry), the other is a medical science (histology). The differences between the schedules for succeeding years

CLASSIFICATION OF THE DENTAL STUDENTS AT THE UNIVERSITY OF ALBERTA: 1921-26

	First year	Second year	Third year	Fourth year	Fifth year ⁸	Total
1921-22 ⁵	7 ⁶	22 ⁷	9	..	..	38
1922-23	21	5	18	..	..	44
1923-24	14	16	4	..	..	34
1924-25	12	10	6	..	..	28
1925-26	10	9	10	7	..	36

University. The medical students are admitted to the six-year medical curriculum after having passed the university matriculation examinations, and having completed the first year in the Academic College, or the equivalent. The first year in each of these professional curricula is, in effect, a pre-professional year in academic subjects.

¹ Similar to "Histology 10" for students of medicine.

² Identical with "Organic chemistry 3" for medical students.

³ Identical with the course in physiology required of medical students in the third (second professional) year.

⁴ Total number of different courses during the year.

⁵ The first year in which students were admitted to the three-year curriculum (including one pre-dental year).

⁶ The first group on the three-year curriculum. ⁷ The last first-year class on the two-year curriculum.

⁸ Equivalent to the fourth year of an American four-year dental curriculum.

are cumulative. The medical curriculum contains the usual reservations for the conventional specialties, but the medical students receive no formal instruction in any aspect of oral health-service.

The dental section of the library is very small but will doubtless be enlarged to meet the requirements of students of clinical dentistry. Research will also probably be initiated after the work in the Infirmary is well under way.

A classification of the students for the past five years is shown in the table on page 587.

GENERAL COMMENT

THE Dental School of the University of Alberta is the only one in Canada west of Toronto. The past and prospective service of the School to the Province of Alberta may be estimated from the accompanying data for total attendance and for the proportion of the students resident in Alberta. Most of the non-resident students are received from Saskatchewan. Now that the University is making suitable arrangements to afford a thorough training in dentistry, the School should minister successfully to the needs not only of the Province of Alberta but also of the wide region west of Ontario. The only medical school in this western section of Canada, besides the one in Alberta, is that of the University of Manitoba. Attention has already been drawn to the fact that a large number of students from British Columbia attend the Dental School of North Pacific College of Oregon (page 514).

ATTENDANCE OF DENTAL STUDENTS AT THE UNIVERSITY OF ALBERTA: 1925-26

	1920-21	1921-22 ¹	1922-23	1923-24	1924-25 ²	1925-26 ³
Total attendance	37.	38	44	34	34	36
Percentage of the students resident in Canadian provinces:						
Alberta	58	53	68	69	47	50
British Columbia	0	2	2	8	9	5
Manitoba	11	2	2	4	6	7
Saskatchewan	22	31	26	15	31	36
All other provinces	9	12	2	4	7	2
Percentage resident in the United States	0	0	0	0	0	0

BRITISH COLUMBIA

Population: 560,500. Number of dentists, 292; physicians, 610. Ratios: dentists to population, 1:1920; physicians to population, 1:919; dentists to physicians, 1:2.1

Statutory requirements. *Dentistry*.—Preliminary education: none. Professional training: graduation from a legally established Canadian dental school or the equivalent. *Medicine*.—Preliminary education: sufficient for admission to a Canadian medical school having a five-year curriculum, or the equivalent. Professional training: graduation from an accredited medical school having a five-year curriculum, or the equivalent

Dental school: none; medical school: none

¹ The last year for admission to the original two-year curriculum (0+2).

² The last year for admission to the intermediate three-year curriculum (1+2).

³ The first year for admission to the full five-year curriculum (1+4).

MANITOBA

Population: 656,400. Number of dentists, 237; physicians, 524. Ratios: dentists to population, 1:2770; physicians to population, 1:1253; dentists to physicians, 1:2.2

Statutory requirements. *Dentistry*.—Preliminary education: sufficient for admission to the Academic College of the University of Manitoba, or the equivalent. Professional training: sufficient to pass prescribed examinations, in the subjects of a conventional dental curriculum, conducted by the University of Manitoba (which has no faculty of dentistry). The necessary training may be obtained by apprenticeship. The Council of the University, which is the sole examining body in dentistry, has authority to grant to graduates of dental schools or associations "such standing as the Council shall deem just." *Medicine*.—Preliminary education: sufficient for admission to a medical school having a five-year curriculum, or the equivalent. Professional training: graduation from an accredited medical school having a five-year curriculum or the equivalent

Dental school: none; medical school: University of Manitoba

NEW BRUNSWICK

Population: 403,300. Number of dentists, 167; physicians, 271. Ratios: dentists to population, 1:2415; physicians to population, 1:1488; dentists to physicians, 1:1.6

Statutory requirements. *Dentistry*.—Preliminary education: sufficient for admission to the Academic College of the University of New Brunswick or the equivalent. Professional training: graduation from "some dental college and . . . [receiving] a degree therefrom." (An explanatory provision in the statute refers to "three school years of nine months each" as equivalent to "four school years of seven months each.") *Medicine*.—Preliminary education: sufficient for admission to the Academic College of the University of New Brunswick. The Council of Physicians and Surgeons of New Brunswick may recognize the results of (1) matriculation examinations for admission to an accredited academic college, and of (2) the examinations for grammar, superior or first-class school license from the Board of Education of New Brunswick, with the addition of Latin and Greek or French. Professional training: graduation from an accredited medical school having a five-year curriculum, or the equivalent

Dental school: none; medical school: none

NOVA SCOTIA

Population: 536,900. Number of dentists, 177; physicians, 457. Ratios: dentists to population, 1:3033; physicians to population, 1:1175; dentists to physicians, 1:2.6

Statutory requirements. *Dentistry*.—Preliminary education: one year in the Academic College of Dalhousie University or the equivalent, the work to include full courses in physics, chemistry, and biology. Professional training: graduation from a dental school having a four-year professional curriculum, or the equivalent, and

accredited by the Provincial Dental Board. *Medicine*.—Preliminary education: two years in the Academic College of Dalhousie University, or the equivalent. Professional training: graduation from a medical school having a five-year curriculum, and accredited by the Provincial Medical Board

Location of the dental school: Halifax; medical school: Halifax

HALIFAX

Population: 55,000.¹ Number of dentists, 37; physicians, 95. Ratios: dentists to population, 1:1487; physicians to population, 1:579; dentists to physicians, 1:2.6 Number of dental clinics or infirmaries, 2; hospitals, sanatoriums, and charitable institutions, 5; hospitals approved for internships, 1

Dental School: Dalhousie University. *Medical School*: Dalhousie University

FACULTY OF DENTISTRY, DALHOUSIE UNIVERSITY

Location: on the site of the University's health-service activities; three-fourths mile from the centre of the city

General character: integral part of Dalhousie University

Organized: in 1912 by transfer, to the University, of the Maritime Dental College, which, founded by the Nova Scotia Dental Association in 1908, had been controlled, from 1908 to 1912, by the Provincial Dental Board of Nova Scotia, and affiliated with the Halifax Medical College and Dalhousie University. By agreement between the Provincial Dental Board of Nova Scotia and the University, the professional examinations are conducted by the examiners of the Faculty of Dentistry at the University, so that candidates may qualify simultaneously for the degree of D.D.S. and for the license to practise in Nova Scotia

Building: the School of Dentistry is situated in a group of buildings in which the Schools of Medicine, Pharmacy, and Law are located. The clinical work in dentistry is done in the main building of the group (Forrest Building), which was erected in 1887; special improvements were made in it in 1921. The total floor area used for instruction by the Faculty of Dentistry, in the Forrest Building and other buildings in the group, is 6000 sq. ft. Distance of the Forrest Building from the main site of the University: one-fourth mile

Infirmary: in the Forrest Building, with eight accessory rooms; total floor area, 5777 sq. ft. Total number of chairs in active use, 33, including groups reserved for special purposes: extraction and prosthodontia, 2 each. In addition, the Dental School has, in the Public Health Clinic, one unit for general operative dentistry, and one child's chair for "pre-school age and preventive dentistry"

Relation of the School of Medicine: the medical and dental students are grouped together for identical instruction and examination in the medico-dental subjects. (The same is true for the academic subjects.) In 1924-25, several teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Dispensary and Hospital in which dental students received accredited instruction, and

¹ The present writer is indebted to the President of Dalhousie University for most of the data relating to population and number of practitioners as of June 1, 1925, and for the following additional data for *Greater Halifax* as of the same date:

Population: 80,000. Number of dentists, 40; physicians, 110. Ratios: dentists to population, 1:2000; physicians to population, 1:727; dentists to physicians, 1:2.7.

performed stated clinical service, 1924-25: the new Dalhousie Out-patient and Public Health Clinic (on the campus), and the Victoria General Hospital (one block)

Clinical facilities in the new Health Clinic and in the Hospital where dental students received instruction in 1924-25: complete for general surgery and oral surgery. A member of the Dental Faculty directs the operations of the students in the Clinic, and guides their observations in the Hospital

Number of dental internships or externships in the new Clinic or Hospital, in 1924-25: none

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: general surgery and oral surgery (Victoria General), and extraction under local or general anesthesia (new Clinic) for juniors and seniors, with particular attention to the relationships between oral and systemic conditions; to teach modern dentistry under the conditions that prevail in a good hospital

Library (primarily medical): room, 600 sq. ft.; whole-time librarian. Contains 7000 bound and 6600 unbound volumes, and 2500 pamphlets (all the volumes are effectively card indexed). Of the volumes, approximately 500 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: University Library (one-fourth mile) and the Provincial Science Library (one-half mile); both in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: part-time officer; also Professor of Preventive and Clinical Dentistry. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: Assistant in the Dental Infirmary; whole-time officer

Length of the curriculum for the degree of D.D.S.: five years, since 1922; equivalent to one year of approved work in an accredited academic college and four years of the curriculum in dentistry, in the system in vogue in the United States

Minimum academic requirement for admission to the first-year class, in September, 1924: pass matriculation in the Academic College or the equivalent (since 1922)

Next prospective advance in the minimum academic requirement for admission: uncertain

Number of graduates (1913-25): 85; average per year, for thirteen years, 7. (Number in 1912 for the Maritime Dental College—5)

Average total attendance per year (at the end of the year), for the past ten years (1916-25): 40; proportion from Nova Scotia in 1922-23—75 per cent; 1923-24—72 per cent; 1924-25—76 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—670; 1921-22—917; 1922-23—1235; 1923-24—980; 1924-25—560

Number of visits, sittings, or operations: 1920-25—no available data

Number of patients treated in the Halifax City Dispensary (none in the Hospital), by dental students under the supervision of representatives of the Dental School: 1920-24—no available data ("groups of three or four students attended two hours a week"); 1924-25—362 patients were given treatment by students in the new Clinic and in the Hospital

FINANCIAL DATA

Estimated value of land and building (Forrest Building), \$236,000, and equipment used by the School, \$27,000; total, \$263,000 (September 30, 1925)

General debt on the School, or carried by the University on the School's account (September 30, 1925): none

DENTAL SCHOOLS IN CANADA

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on June 30				
<i>Current income:</i> ¹				
Fees (all kinds) paid by the students	\$11,081	\$13,327	\$13,441	\$9,299
Fees paid by patients, in all clinical departments	3,306	2,667	3,732	2,873
Gifts	224	200	125	125
Miscellaneous receipts	None	None	258	161
University funds, additional to the income designated above:				
(a) Direct appropriation	None	None	None	None
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	8,346	12,523	11,521	15,350
Total amount of current income	\$22,957	\$28,717	\$29,077	\$27,808
<i>Total amount of current expenditures</i>	\$22,957	\$28,717	\$29,077	\$27,808
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above	8,346	12,523	11,521	15,350
Average amount expended by the School per student (D.D.S.) per year	403	449	454	556
Average amount of all student fees paid to the School per student (D.D.S.) per year	194	208	210	186
<i>Details of expenditures:</i> ²				
For repairs	2,888	6,744	2,714	124
For new equipment				
For research	None	None	None	None
For improvement of the library	145	200	100	50
For supplies used in the clinical departments	2,556	2,115	2,356	1,817
For salaries: for administration	2,000	1,583	2,383	3,058
For salaries: for teaching	9,028	11,594	13,880	15,509
For all other purposes	6,340	6,481	7,644	7,250
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(15)	(16)	(16)	(15)
Amount of their salaries as teachers	3,770	5,657	7,540	7,776
Number of teachers of dental subjects who did not receive salaries (or honoraria)	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary) ³	...	2,400	2,750	2,750
Smallest salary paid to a whole-time teacher of a dental subject	...	2,400	1,667	2,000
(Number of teachers of academic or medico-dental subjects)	(17)	(20)	(16)	(24)
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	5,258	5,937	6,340	7,733
Largest salary paid to a whole-time teacher of an academic or medico-dental subject ⁴	4,000	4,000	4,500	4,500

¹ During the academic years 1920-24, there was no surplus, no appropriation by the Province or City, and no income from endowment; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² During the academic years 1920-24, there was no payment on account of debt, rent, new construction, or land.

³ There were no whole-time teachers of dental subjects before 1921-22.

⁴ The academic and medico-dental subjects are taught to medical and dental students in the same classes.

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on June 30				
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	\$900	\$1,000	\$1,000	\$1,200
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget but was paid by the University or from the medical budget (the "allotment" referred to above)	5,258	5,927	6,340	7,733

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 42. Of this total number, 16 were whole-time, 4 half-time, and 4 part-time or occasional teachers of academic or medico-dental subjects; 2 were whole-time, 1 was a half-time, and 15 were part-time or occasional teachers of dental subjects; 2 were whole-time teachers in the Dental School only; 14 were "full" professors; 8 were associate or assistant professors; none were lecturers by title;¹ all received salaries (or honoraria); 28 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Advanced courses for dental practitioners: see item next below

Summer courses in clinical dentistry (July): "a week's summer clinic, in coöperation with the Nova Scotia Dental Association, in 1917, 1919, 1921, and 1923" — none in 1925; attendance: 1919—30; 1921—40; 1923—50

Dental extension teaching: see item next above

No combined curricula leading to the degrees of B.S. or B.A., and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry

Research: actively in progress in 1924-25, on statistical studies of the incidence of dental

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	27	54	57	64	67	50
Women.....	1	1	3	3	3	2
From countries other than Canada and Newfoundland.....	1	0	0	1	2	1
Negroes.....	0	0	0	0	0	0
Attendance at the end of the year.....	27	54	57	64	64	50
Admitted after examination.....	9	13	11	9	4	0
Admitted to advanced standing.....	0	0	0	0	0	0
From other countries, to advanced standing.....	0	0	0	0	0	0
"Repeaters" of one or more subjects.....	2	4	7	0	3	2
Denied further instruction because of deficient scholarship.....	2	0	3	4	5	1
GRADUATES (D.D.S.)						
Total number of graduates.....	5	2	6	8	17	18
Women.....	1	0	0	0	1	2
Admitted to practice in countries other than Canada and Newfoundland.....	0	1	0	0	1	0
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of provinces in which graduates took their first license examinations ²	1	1	1	1	1	1
Percentages of failures in Dominion Council or provincial dental-board examinations	0	0	0	0	0	0

¹ Twenty dentists who gave voluntary service, and are included above, delivered lectures.

² Graduation from the School does not automatically admit to license, but at present it qualifies for license because the Provincial Dental Board accepts the results of the University examinations, instead of setting one of its own. The desirability of a licensing examination, conducted by the Board, is now under consideration.

caries; pathology of dental pulp; reasons for the irritation of soft tissues caused by vulcanite dentures; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service. Occasional requests for dentists are communicated to the senior class

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: January, 1922

The foregoing data have been verified in detail by the President of the University

SUMMARY

THIS School, in conducting a five-year curriculum of which the first year is devoted to academic subjects, is similar to those at Alberta and Toronto. In its intimate association with the Medical School and with the Public Health Clinic, it resembles the School at McGill, although its main Infirmary is not located in the Hospital. In esthetics, the Faculty's appreciation is analogous to that at the School in the University of Montreal. The annual Announcements since 1922-23 have contained this statement regarding an unusual course in "drawing and modelling," which, adapted to dental needs, is required in the second (first professional) year: "This course . . . is elementary but sufficiently comprehensive to form a suitable introduction to several succeeding dental subjects in which artistic principles play an important part. It includes elementary free-hand drawing; elementary perspective; the principles and practice of drawing to scale; simple modelling in clay or plasticine; the study of ideal facial contours of the various types, with special attention to the proportions and relative positions of the features in each, particular care being taken with the lower third of the face. Finally, the color and texture of the skin, lips, teeth, etc., will be studied from the artistic standpoint so that the harmony existing may be disclosed and analyzed." The work offered in this course illustrates the type of fundamental study in esthetics that is needed in the education of the general practitioner of dentistry, and which in the United States could be included in an entrance requirement of two years of approved work in an academic college (page 131).

The medical and dental students are given identical instruction and examinations in the academic and medical sciences common to the medical and dental curricula, although their preliminary preparation is not equivalent, and the professional years in the medical and dental programs are unequal in number and dissimilar in content. In the dental curriculum, dental technology and medical sciences are taught throughout the first two professional years. The School, which now confines its attention to work for undergraduates, is urgently in need of funds to enable it to pay adequate salaries for instruction, to increase the number of whole-time teachers of dental subjects, to improve the dental section of the

DATA PERTAINING TO THE DENTAL SCHOOL OF DALHOUSIE UNIVERSITY: 1921-26

	Percentage resident in Nova Scotia	First year	Second year	Third year	Fourth year	Fifth year ¹	Total	Graduates
1921-22	78	23	16	17	8	..	64	8
1922-23	75	12 ²	20	17	17	..	66	17
1923-24	72	10	8 ²	14	18	..	50	18
1924-25	76	6	7	6 ²	14	..	33	14
1925-26	70	13	8	6	6 ²	..	33	0 ¹

¹ There will be no graduates in 1926. In 1926-27 the present fourth-year class will be the first fifth-year class.

² The five-year curriculum was begun for the class admitted in 1922.

medical library, and to promote research in the correlations between clinical medicine and clinical dentistry, for the development of which, in collaboration with workers in the associated Clinic and Hospital, the School has exceptional opportunities.

The medical curriculum does not include any of the special aspects of clinical dentistry, although the conventional specialties of medicine receive formal attention. Informal instruction in oral health-service for medical students has lately been begun in the new Public Health Clinic, where the Dental Clinic is equal to the Eye Clinic in size and opportunity, and promises to become an important feature in the development of medical education at Dalhousie.

A classification of the total attendance in recent years is shown in the table on page 594.

GENERAL COMMENT

THERE are no dental schools in New Brunswick, Prince Edward Island, or Newfoundland, which with Nova Scotia constitute the territory that the Dalhousie School may be expected to serve with increasing success. At present (1925) there are 167 dentists in New Brunswick, 24 in Prince Edward Island, and 11 in Newfoundland, many of whom are graduates of dental schools in the United States. The proportion of Nova Scotians among the Dalhousie dental students during the past four years has ranged between 70 and 76 per cent. Data for the geographical distribution of the students, in 1924-25, are given in the table below.

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT DALHOUSIE UNIVERSITY: 1924-25

<i>Provinces (3) and countries other than Canada (2)</i>	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year¹</i>	<i>Total</i>
British West Indies	0	0	0	1	1
New Brunswick	3	0	0	1	4
Newfoundland	0	0	0	0	0
Nova Scotia	3	8	4	11	26
Prince Edward Island ²	0	0	2	1	3
Total	6	8	6	14	34

Prospective general practitioners of dentistry in the Maritime Provinces continue to obtain their professional education in provinces other than Nova Scotia, and also in the United States, but with the growth of the Dalhousie School this tendency will probably disappear. The annual graduation at Dalhousie of about twenty-five to thirty-five dentists resident in the Maritime Provinces would probably meet the most urgent needs of this region at the present rate of increase in the population.

ONTARIO

Population: 3,103,000. Number of dentists, 1782; physicians, 3839. Ratios: dentists to population, 1:1741; physicians to population, 1:808; dentists to physicians, 1:2.2. Statutory requirements. *Dentistry*.—Preliminary education: pass matriculation; equivalent to that for admission to the Academic College of the University of Toronto, with full credit in Latin, English, history, mathematics, physics and chemistry, and Greek or a modern foreign language. Honour matriculation, in addition, will be required after 1926-27. Professional training: graduation from a dental

¹ The fifth year was begun for the class admitted in 1922, which is now the fourth-year class (1925-26).

² One additional student from Prince Edward Island was "registered for examinations only."

school having a five-year curriculum (one pre-dental year, and four professional years), or the equivalent on the Canadian plan, and accredited by the Royal College of Dental Surgeons. *Medicine*. — Preliminary education: pass matriculation; equivalent to that for admission to the Academic College of the University of Toronto. Professional training: graduation from a medical school having a five-year curriculum (one pre-medical and four professional years), or the equivalent on the Canadian plan, and accredited by the Council of the College of Physicians and Surgeons of Ontario

Location of the dental school: Toronto; medical schools (3): Kingston, London, and Toronto

TORONTO

Population: 549,429.¹ Number of dentists, 645; physicians, 1086. Ratios: dentists to population, 1: 852; physicians to population, 1: 506; dentists to physicians, 1: 1.7 Number of dental clinics or infirmaries, 2; hospitals, sanatoriums, and charitable institutions, 24; hospitals approved for internships, 1

Dental School: University of Toronto. *Medical School*: University of Toronto

SCHOOL OF DENTISTRY, ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO; DENTAL DEPARTMENT, UNIVERSITY OF TORONTO

Special note. On July 1, 1925, the School of Dentistry of the Royal College of Dental Surgeons became the Faculty of Dentistry of the University of Toronto, the Royal College of Dental Surgeons relinquishing to the University its teaching responsibilities but retaining its function as a licensing body for the Province of Ontario. The data in this statistical statement pertain to the School at the end of the academic year 1924-25, before the School became an integral part of the University. Recent developments are indicated in the Addendum on page 601

Location: 240 College Street; one and one-fourth miles from the centre of the city

General character: owned and conducted by the Royal College of Dental Surgeons of Ontario, the incorporated dental profession of the Province since 1868. The School has been associated with the University of Toronto since 1888. By agreement, the School and University arrange a dental curriculum satisfactory to both, which is conducted by the School; since 1889 the University has awarded the degree of D.D.S. In 1920, public control of the School was extended by the passage of an Act, by the Ontario Legislature, providing that the real estate belonging to the Royal College (including that of the School) might not be sold, mortgaged, leased, or disposed of except with the consent of the Minister of Education for the Province, who, since the passage of the Act, is *ex officio* a member of the Board of Directors of the Royal College of Dental Surgeons of Ontario. (See "Special note," above)

Organized: in 1875, under the general direction and supervision of the Directors of the Royal College of Dental Surgeons. The Faculty received the lecture fees and assumed all financial responsibility. Its proprietary status was ended, in 1893, when the School was made an integral part of the Royal College of Dental Surgeons of Ontario. In 1869, there had been a premature establishment, by the Directors of the Royal College, of a School of Dentistry in Toronto, in affiliation with the Medical College of Victoria University, but the School was discontinued in 1870 at the end of the first year. (See "Special note," above)

Building: erected in 1909; annex added in 1915; extension made in 1919; total floor area,

¹The present writer is indebted to Dean Wallace Secombe of the Dental School for the estimate of the population of Toronto, and for the correct number of dentists in that city, as of June 1, 1925.

51,600 sq. ft. Distance from the main site of the University of Toronto, and of the buildings of its School of Medicine, three blocks

Infirmary: in the dental building, with fifteen accessory rooms; total floor area, 7200 sq. ft. Total number of chairs in active use, 129, including groups reserved for special purposes: prosthodontia, 21; oral surgery and demonstration, 3 each; examination, 1

Relation of the Faculty of Medicine of the University of Toronto: the Medical Faculty did not cooperate in teaching the medico-dental subjects, but some of the members individually gave instruction to dental students, in the dental building, as members also of the Faculty of the School of Dentistry. In 1924-25, one teacher of a medical subject gave dental students instruction in clinical medicine; one teacher of a dental subject gave medical students instruction in clinical dentistry

Hospitals in which dental students received accredited instruction, and performed stated clinical service, in 1924-25: Grace Hospital (across the street), Toronto General Hospital (four blocks), and Western Hospital (one mile)

Clinical facilities in the Hospitals where dental students received instruction in 1924-25: each Hospital has a complete dental equipment in a room provided for the oral service

Number of dental internships or externships, held by officers or students of the School, in the Hospitals in 1924-25: none. The dental work in each Hospital is now organized as a part of its regular service, with a staff of half-time or part-time dentists, some of whom are officers of the School

Nature and specific purposes of the accredited clinical instruction given elsewhere than in the dental building, in 1924-25: dental students, in small groups, are given instruction by medical teachers; to teach physical diagnosis, medicine, and surgery under the conditions that prevail in good hospitals

Library (in the dental building): room, 722 sq. ft.; part-time librarian. Contains 1129 bound and about 2000 unbound volumes, and 100 pamphlets (not effectively card indexed). Of the volumes, approximately 2885 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Libraries of the University of Toronto and its School of Medicine (three blocks), and the Central Public Library (within the block); all in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: whole-time officer; also Professor of Preventive Dentistry. *Associate Dean* (or equivalent officer): none. *Secretary*: whole-time officer; also Professor of Materia Medica and Pharmacology, and Associate Professor of Prosthetic Dentistry

Dental titles and degree awarded: (a) *diploma* of Licentiate of Dental Surgery (L.D.S.), which carries the legal right to practise dentistry in Ontario; also the *degree* of D.D.S. Neither the Royal College of Dental Surgeons of Ontario nor the Faculty of its School of Dentistry has authority to grant degrees, but association with the University of Toronto has enabled the School, since 1889, to secure for its graduates the University's degree of D.D.S. Since 1894, the Board of Directors of the Royal College and the Trustees of the University of Toronto have appointed a Joint Board of Dental Examiners to conduct the annual examinations of all dental students. Seniors who complete the prescribed curriculum and pass the examination held by the Joint Board of Dental Examiners, receive the title of L.D.S. from the College and the degree of D.D.S. from the University—in effect, such students are graduated from both the School and the University, and also licensed by the Royal College to practise in Ontario, simultaneously by the same examiners. (The Joint Board of Dental Examiners also examines graduates of other dental schools who may apply for license to practise dentistry in Ontario.) From 1900 to 1922,

inclusive, the special Convocation of the University for the award of degrees in dentistry was held jointly with the Commencement of the Royal College of Dental Surgeons. Since 1923, dental students have received the degree of D.D.S. at the regular annual Convocations of the University, but the certificates of license have been awarded at independent Commencements of the College. (b) Beginning in 1875, the *title* of M.D.S. (Master of Dental Surgery) has been given by the College to Licentiates in Ontario, who, after a period of five years in dental practice, have passed special examinations and presented acceptable theses. This title has been given to 31 practitioners in Ontario. (See the Addendum, page 601)

Length of curriculum for the degree of D.D.S.: five years, since 1921; the first year is devoted largely to pre-professional study

Minimum academic requirement for admission to the first-year class, in September, 1924: "pass matriculation" (middle school) in English, history, mathematics, Latin, experimental science (physics and chemistry), and in Greek, German, French, Italian, or Spanish — preferably French (since 1923)

Next prospective advance in the minimum academic requirement for admission: "honour matriculation," in English (literature and composition), mathematics (algebra; geometry, and trigonometry) and Latin, Greek, French, or German, beginning in September, 1927; this is now required for admission to the six-year medical curriculum. "Honour matriculation may be taken in high schools equipped and staffed for the purpose," and is equivalent to the first year in the academic college of the University

Number of graduates (1876-1925): 2771; average per year, for fifty years, 55

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 561; proportion from Ontario: 1922-23—75 per cent; 1923-24—75 per cent; 1924-25—78 per cent

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—4000; 1921-22—4500; 1922-23—6000; 1923-24—5260; 1924-25—4768 (the figures for 1920-22 are estimates)

Number of visits, sittings, or operations: 1920-25—no available data

Number of patients treated in the Hospitals, by dental students under the supervision of representatives of the Dental School: 1920-25—no available data

FINANCIAL DATA

Estimated value of land and buildings, \$375,000, and equipment, \$100,000; total, \$475,000 (April 30, 1925)

General debt on the School (April 30, 1925): \$61,005 at 6 per cent interest per annum

Accumulated net assets (June 30, 1925): \$494,000

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Current income</i> : ¹				
Appropriated by the Province ²	\$13,029	\$25,780	\$25,000	None
Fees (all kinds) paid by the students	171,092	144,015	122,382	\$99,675
Fees paid by patients, in all clinical departments	26,621	46,622	58,939	42,630
Miscellaneous receipts	7,500	1,732	2,704	1,769
From the University of Toronto	None	None	None	None
Total amount of current income	\$218,242	\$218,149	\$209,025	\$144,074

¹ During the academic years 1920-24, there was no appropriation by the City, and no income from endowment or gift; and all miscellaneous receipts are included in the recorded items above. See "Capital income," on page 599.

² For loans of fees to ex-service men; repayable to the Royal College after graduation.

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
<i>Total amount of current income, brought forward</i>	\$218,242	\$218,149	\$209,025	\$144,074
<i>Total amount of current expenditures</i>	\$188,165	\$205,753	\$200,738	\$150,546
Net income for the year ¹	30,077	12,396	8,287	...
Deficit for the year	...	...	...	6,472
<i>Capital income:</i>				
Net current income	\$30,077	\$12,396	\$8,287	None
Borrowed	51,971	None	None	None
Total	\$82,048	\$12,396	\$8,287	None
<i>Capital expenditures:</i>				
Current deficit	None	None	None	\$6,472
For new construction (no land)	\$82,048	\$3,178	None	None
For reduction in principal of debt	None	9,218	\$8,287	None
Total	\$82,048	\$12,396	\$8,287	\$6,472
Surplus	None	None	None	...
Deficit	None	None	None	6,472
Average amount expended by the School per student (D.D.S.) per year	214	248	278	310
Average amount of all student fees paid to the School per student (D.D.S.) per year, including loans of fees to ex-service men	209	205	204	205
<i>Details of current expenditures:</i>				
For interest on debt	None	1,850	2,273	1,920
For rent	None	None	None	None
For repairs	771	3,003	5,095	4,444
For new equipment	28,712	20,268	8,557	2,734
For new construction (or land) ¹	None	None	None	None
For research	1,840	1,840	1,840	1,840
For improvement of the library	340	454	283	254
For supplies used in the clinical departments	10,649 ²	18,649 ²	23,512	15,820
To the University of Toronto ³	2,845	10,444	10,497	9,411
For salaries: for administration ⁴	21,600	23,000	25,553	16,641
For salaries: for teaching	90,905	102,571	99,420	81,475
For all other purposes ⁴	30,503	23,674	23,708	16,007
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(62)	(67)	(61)	(56)
Amount of their salaries as teachers	73,837	83,058	77,176	65,829
Number of teachers of dental subjects who did not receive salaries	(3)	(10)	(6)	(9)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	5,000	5,000	5,000	5,000
Smallest salary paid to a whole-time teacher of a dental subject	3,500	3,500	3,500	3,500
(Number of teachers of academic or medico-dental subjects)	(24)	(24)	(25)	(24)
Amount of their salaries as teachers	17,068	19,513	22,244	15,646

¹ See "Capital expenditures." ² A close estimate.

³ The payments to the University were the amounts of the fees for the examinations.

⁴ Includes secretarial salaries for service for both the Royal College and the Dental School; "separation on the records is impossible."

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	\$1,500	\$1,600	\$1,800	\$1,600
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	1,440	1,200	1,600	1,600

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 70. Of this total number, 1 was a whole-time, 2 were half-time, and 19 part-time or occasional teachers of academic or medico-dental subjects; 6 were whole-time, 24 half-time, and 18 part-time or occasional teachers of dental subjects; 6 were whole-time teachers in the Dental School only; 19 were "full" professors; 6 were associate professors; 5 were lecturers by title; 9 received no salaries; 18 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

Course for dental nurses (assistants): since 1919; attendance: 1921-22—22; 1922-23—12; 1923-24—12; 1924-25—10

Advanced courses for dental practitioners (annually in September): since 1921; attendance: 1922—35; 1923—52; 1924—106; 1925—70

Summer courses in clinical dentistry (May and June, and September): since 1920; all fourth-year (junior) students are required successfully to complete, during the summer, either one month in the School Infirmary or two months in the office of an approved Licentiate, before being admitted to the fifth (senior) year. Attendance: 1922—210; 1923—72; 1924—91; 1925—59

Dental extension teaching: lectures and clinics before local societies, since 1921

No combined curricula leading to the degrees of B.S. or B.A., and D.D.S.; no course for dental mechanics or technicians; no course for dental (oral) hygienists; no graduate course

STUDENTS AND GRADUATES

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance ¹	484	804	889	837	725	490 ¹
Women.....	9	14	17	15	12	6
From countries other than Canada; chiefly from the United States, Australia, and Japan.....	1	6	6	10	9	11
Negroes, from British West Indies.....	0	0	2	2	2	1
Attendance at the end of the year ¹	481	800	879	828	721	486
Admitted after examination.....	0	0	0	0	0	0
Admitted to advanced standing.....	5	36	10	18	41	23
From other countries, to advanced standing.....	1	4	3	5	3	7
"Repeaters" of one or more subjects ²	28	35	31	1	1	0
Denied further instruction because of deficient scholarship.....	0	0	0	0	0	0
GRADUATES (D.D.S.)						
Total number of graduates.....	86	127	141	180	315	179
Women.....	0	0	3	6	6	1
Admitted to practice in countries other than Canada	No available data					
Negroes.....	0	0	0	0	1	1
	1919	1920	1921	1922	1923	1924
Number of provinces in which graduates took their first license examinations.....	All graduates were automatically licensed to practise in Ontario, as explained under "Dental titles and degree awarded"					
Percentages of failures in provincial dental board examinations.....						

¹ The sharp rise (1918-21) and the corresponding fall (1921-24) in the number of students were due, in the main, to the admission and graduation of several classes that became very large in consequence of temporary post-war conditions. The addition of one year to the curriculum (1921) and the recent financial stringency have tended to diminish the attendance.

² Since 1921, students have not been permitted to proceed to a higher year carrying a condition.

Research: actively in progress in 1924-25, on the nature and origin of periodontal disease, including the mechanics of occlusion and the signs of incipient periodontal disease; six publications in 1924 and 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: copies of the appended questionnaire have been sent, annually, to towns and cities throughout the Province of Ontario, and the returned copies placed at the disposal of graduates and members of the graduating classes

QUESTIONNAIRE

Note: In certain localities the people are now required to travel some distance before obtaining the services of a practitioner of dentistry. The following information is desired that these conditions may be improved, and graduates in dentistry directed to districts where there will be the greater opportunity to serve the public. May we count upon your prompt and hearty coöperation in answering the following questions? ROYAL COLLEGE OF DENTAL SURGEONS, TORONTO, ONTARIO

(1) Name of town?; Province?; (2) Total population?; School population? (3) What industries are located in town? (4) Population of surrounding country within radius of five miles? (5) Names of dentists now in town? (6) Hospitals located in your vicinity? (7) Names of physicians in practice in town? (8) Nearest dentists at outside points (*name, town and miles distant*): (9) What special local conditions, if any, such as predominating language, religion, or other factor, should be considered by a prospective practitioner? (10) What are the facilities for modern dental practice? (a) Available office and rent? (b) Water supply? (c) Sewage disposal (d) Electricity? (e) Gas? (11) Railway facilities

This information was furnished by (*name and address*):

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research, although questionnaires such as the foregoing yield much information regarding the graduates, a record of which is kept by the Secretary of the Board of Directors

Visited: April and December, 1922; May, 1924; December, 1925

The foregoing data have been verified in detail by the Dean

ADDENDUM

OWNERSHIP of the School was transferred from the dental profession (Royal College of Dental Surgeons of Ontario) to the University of Toronto for two main reasons: (a) so far as possible to make the facilities of the University available to the Faculty of Dentistry, and, by effecting coöperation between the University and the Board of Directors of the Royal College of Dental Surgeons (Ontario Dental Licensing Board), (b) not only to promote dental education and practice, but also to obviate duplication of professional examinations. Cordial coöperation between the teaching and licensing bodies in Ontario will be maintained on the following plan: The dental profession transferred to the University the dental building and equipment, valued at \$494,000, but retained an equity of \$50,000, on which the University annually will pay \$2500 as interest. In the dental building the Board will occupy a room or rooms without rental for meetings and executive purposes. The University tuition fees will include the Ontario license examination fee, which will be paid by the University to the Board. The Faculty of Dentistry will conduct the professional examinations, and the University will report the results to the Licensing Board. The Faculty of Dentistry will elect a representative to serve as a member of the Licensing Board. The Board will designate three of its members for seats in the Faculty Council. The University

and the Board jointly will make provision for extension lectures by members of the Faculty to county dental societies, and will give special attention to the more sparsely settled districts of the province. Practitioners will be encouraged to refer their difficult problems or obscure cases to the Faculty for advice. Bulletins issued by the Faculty will also be available to practitioners. The University has established a departmental library to be housed in the dental building, with which the Harry R. Abbott Memorial Library of the Royal College of Dental Surgeons has been incorporated. The Abbott Library will be supported by the annual income from a permanent fund of \$15,000. These dental libraries will be accessible to both practitioners and students under the direction of the Faculty Council.

Formerly, during the period of general affiliation with the University, the instruction in all of the departments was given in the dental building. Much of the work in the pre-clinical years is now being done in the university departments concerned. Dental Research, given a fresh impetus through this development, has been associated with all of the teaching departments, and the separate organization for its promotion, which previously existed in the University, has been discontinued.

SUMMARY

For fifty years this School was the direct instrument of the organized profession of Ontario for the promotion of dental practice in the province. The recent organic union of the School with the University of Toronto, under conditions that assure generous public support for dentistry as a division of health service, has invigorated the School and given it a broader opportunity. The cordial coöperation of the University's teachers of the academic and medical sciences, with which the School has begun its new relationship, and prospective early elevation of the entrance requirement to parity with that for the Medical School (1927-28), will assure for dentistry at Toronto not only close similarity to medi-

CLASSIFICATION OF THE TOTAL ATTENDANCE AT THE DENTAL SCHOOL OF THE UNIVERSITY OF TORONTO: 1922-26

	First year	Second year	Third year	Fourth year	Fifth year	Total
1922-23	{ .. 45	{ .. 84	{ ... 106	320 ¹ 171	{	} 726
1923-24	58	57	79	106	185		485
1924-25	58	63	58	81	114	374
1925-26	53	70	60	60	92	335

GEOGRAPHICAL DISTRIBUTION OF THE STUDENTS AT THE SCHOOL OF DENTISTRY, ROYAL COLLEGE OF DENTAL SURGEONS; UNIVERSITY OF TORONTO, 1924-25

Provinces (8), and countries other than Canada (5)	First year	Second year	Third year	Fourth year	Fifth year	Total
Alberta	3	1	1	2	1	8
British Columbia	2	0	1	4	3	10
Manitoba	1	5	3	12	12	33
New Brunswick	2	1	0	1	0	4
Nova Scotia	0	1	0	0	1	2
Ontario	49	53	49	56	83	290
Quebec	0	0	0	0	1	1
Saskatchewan	0	1	4	5	10	20
Australia, British West Indies, Newfoundland, South Africa, United States—one or two each	1	1	0	1	3	6
Total	58	63	58	81	114	374

¹One of the large classes admitted under temporary post-war conditions; the last of the classes on the four-year curriculum.

Research: actively in progress in 1924-25, on the nature and origin of periodontal disease, including the mechanics of occlusion and the signs of incipient periodontal disease; six publications in 1924 and 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: copies of the appended questionnaire have been sent, annually, to towns and cities throughout the Province of Ontario, and the returned copies placed at the disposal of graduates and members of the graduating classes

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Note: In certain localities the people are now required to travel some distance before obtaining the services of a practitioner of dentistry. The following information is desired that these conditions may be improved, and graduates in dentistry directed to districts where there will be the greater opportunity to serve the public. May we count upon your prompt and hearty coöperation in answering the following questions? ROYAL COLLEGE OF DENTAL SURGEONS, TORONTO, ONTARIO

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of a state board as the enforcement of the dental statute, or the independent examination of graduates of schools in other states and countries.

The School, by the means indicated on page 601, has actively endeavored to place licensed graduates in communities particularly in need of oral health-service. As a rule, despite this special effort but in accord with prevailing tendencies everywhere, licensed graduates initiated their practice where they believed conditions would be most fortunate for themselves (page 87). Coöperating with the Licensing Board and the Provincial Department of Health, the School has begun an elaborate plan of university extension for the benefit of the dentists of the province, who will be organized into county groups and will meet at convenient centres. The services indicated in the following quotation from an official announcement (November 25, 1925) will be made available:

"1. *Library*.—The dental library [enlarged and made more serviceable under the auspices of the University] is accessible to dental practitioners of Ontario, who may secure books by mail to be returned within a two weeks period.

"2. *Teachers*.—Every member of the Faculty is available for extension lectures. The local society will pay the expenses of the teacher, while the Faculty will pay the honoraria. It is recommended that in each case the meeting extend over an afternoon and evening, and when possible over a longer period, that a more intensive study may be made of the subject under consideration. In making applications, the societies are requested to suggest the subject or subjects they prefer.

"3. *Publications*.—Arrangements have been completed with the University of Toronto Press to supply the profession with bulletins issued from time to time by members of the Faculty dealing with the newer developments in dentistry. These will be supplied at a nominal cost, and a list will be issued to the profession by the University of Toronto Press at an early date."

The general service of the School to the province, during recent years, may be estimated from the data in the accompanying table.

DATA PERTAINING TO THE DENTAL SCHOOL OF THE UNIVERSITY OF
TORONTO: 1919-26

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Total attendance ¹	800 ²	879 ³	828	796	485	377	335
Proportion of students resident in Ontario	75 ²	77	74	75	75	78	79
Number of graduates	127	141	180	315 ³	179 ²	107	92 ⁴

PRINCE EDWARD ISLAND

Population: 87,300. Number of dentists, 24; physicians, 72. Ratios: dentists to population, 1: 3638; physicians to population, 1: 1213; dentists to physicians, 1: 3.0
Statutory requirements. *Dentistry*.—Preliminary education: none. Professional

¹ In 1918-19 the attendance at the end of the year was 481; the number of graduates was 86. See footnote 2.

² The first group affected by the lengthening of the combined academic and professional curricula to five years.

³ The very large attendance in 1920-21, and the unusual number of graduates in 1923, represented a temporary policy due to post-war conditions.

⁴ The number of seniors (December, 1925).

training: graduation from any dental school in Canada or Great Britain, from any dental school in the United States "recognized by the National Association of Dental Examiners," or from an accredited dental school in any other country. *Medicine*.—Preliminary education: sufficient for admission to a medical school having a five-year curriculum or the equivalent. Professional training: graduation from an accredited medical school having a five-year curriculum or the equivalent
Dental school: none; medical school: none

QUEBEC

Population: 2,520,000. Number of dentists, 609; physicians, 2274. Ratios: dentists to population, 1: 4138; physicians to population, 1: 1108; dentists to physicians, 1: 3.7

Statutory requirements. *Dentistry*.—Preliminary education: completion of two years of approved work in the academic college of one of the universities in the province or the accredited equivalent. Professional training: graduation from either of the dental schools in the province (four-year professional curriculum) or the accredited equivalent. *Medicine*.—Preliminary education: equivalent to that for admission to the academic college of one of the universities in the province. Professional training: graduation from a medical school in the province having a five-year curriculum (one pre-medical year and four professional years), or the accredited equivalent

Location of the dental schools (2): Montreal; medical schools (3): Montreal (2), Quebec

MONTREAL

Population: 950,000.¹ Number of dentists, 393; physicians, 1050. Ratios: dentists to population, 1: 2417; physicians to population, 1: 905; dentists to physicians, 1: 2.7
Number of dental clinics or infirmaries, 2; hospitals, sanatoriums, and charitable institutions, 22; hospitals approved for internships, 2

Dental Schools: (1) Montreal University and (2) McGill University. *Medical Schools* (2): McGill University, Montreal University

(1) FACULTY OF DENTAL SURGERY, UNIVERSITY OF MONTREAL

Location: St. Hubert and De Montigny Streets; in the centre of the city

General character: integral part of the University of Montreal

Organized: in 1920, by absorption of the School of Dentistry of Laval University (1903-20). The Dental College of the Province of Quebec was organized in 1893. It was conducted under the supervision of the Board of Examiners of the Dental Association of the Province of Quebec, and was affiliated with the University of Bishop's College (Lennoxville) until 1903. Instruction was given in two Sections, French and English, but this division could not be maintained successfully. In 1903 the French Section of the College became the School of Dentistry of Laval University, which since 1921 has been the Faculty of Dental Surgery of the University of Montreal, the latter having been a branch of Laval University (Quebec) from 1878 to 1921. (See the statement regarding the organization of the Faculty of Dentistry of McGill University, page 610)

¹ The present writer is indebted to Dean Eudore Dubeau, of the Dental School of Montreal University, for the estimate of the population of Montreal as of June 1, 1925.

Building: erected in 1913; completely repaired after a serious fire in December, 1922; total floor area, 24,000 sq. ft. Three blocks from the main site of the University, and of the medical building. The first of three floors is occupied by an affiliated Veterinary School

Infirmary: in the dental building, with six accessory rooms; total floor area, 2650 sq. ft. Total number of chairs in active use, 50, including groups reserved for special purposes: prosthodontia, 8; oral surgery, 2; demonstration, 2; examination, 1

Relation of the School of Medicine: the medico-dental subjects are taught in the dental building without coöperation from the Faculty of Medicine; chemistry is taught in the medical building by members of the Faculty of Sciences. In 1924-25, teachers of medical subjects did not give dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Dispensary or Hospital in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: none

Library (in the dental building): room, 600 sq. ft.; part-time librarian. Contains 600 bound and 300 unbound volumes, and 100 pamphlets (all effectively card indexed). Of the volumes, approximately 800 relate to dental subjects

Library facilities additional to those in the dental building that are conveniently accessible to dental students: Libraries of the University and Medical School (three blocks); in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: whole-time officer; also Professor of Dental Pathology and Oral Surgery. *Vice-Dean*: whole-time officer; also Professor of Operative Dentistry, Crown and Bridge Work, and Dental Technology

Minimum academic requirement for admission to the first-year class, in September, 1924: "six years of classical studies [Rhétorique] in a French university or college; or four years of high school plus two years of college in an English university," or the equivalent of either, as determined by examination by the College of Dental Surgeons of the Province (since 1923)

Latest advance in the minimum academic requirement for admission: "seven years of classical studies [Philosophy, Jr.], or four years of high school, plus three years of college," beginning in September, 1925. In September, 1927, one more year will be added to the requirement which, in 1929 and thereafter, will be "a bachelor's diploma from a university"

Number of graduates (1921-25): 187; average per year, for five years, 37. (Number for the School of Dentistry of Laval University, 1905-20—290; average per year, for sixteen years, 18)

Average total attendance, per year (at the end of the year), for the past five years (1921-25): 182; proportion from the Province of Quebec: 1922-23—90 per cent; 1923-24—92 per cent; 1924-25—95 per cent. (Average total attendance at the School of Dentistry of Laval University, during its last six years, 1915-20—134)

Clinical service of the Dental School in the instruction of students:

Number of persons treated: 1920-21—5579; 1921-22—6134; 1922-23—6737; 1923-24—10,084; 1924-25—8649 (the figures are estimates)

Number of visits: 1920-21—11,159; 1921-22—12,267; 1922-23—13,474; 1923-24—20,169; 1924-25—17,299

FINANCIAL DATA

Estimated value of land and building (Dental School portion), \$292,500, and equipment, \$98,064; total, \$390,564 (June 30, 1925)

General debt on the School, or carried by the University on the School's account (June 30, 1925): \$51,835 at 5 per cent interest per annum

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on June 30				
<i>Current income:</i> ¹				
Appropriated by the City	\$2,200	\$2,200	\$2,200	\$2,200
Fees (all kinds) paid by the students	40,574	37,833	40,827	39,632
Fees paid by patients, in all clinical departments	2,441	2,327	2,869	4,402
University funds, additional to the income designated above:				
(a) Direct appropriation	16,629	19,485	15,952	27,831
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	None	None	None	None
Total amount of current income	\$61,844	\$61,845	\$61,848	\$74,065
<i>Total amount of current expenditures</i>	\$61,844	\$61,845	\$61,848	\$74,065
<i>Capital expenditures</i> (additional) by the University: ²				
For new equipment	3,292	6,543	3,770	12,778
For new construction (or land)	None	None	None	None
For additions to the library	122	328	96	168
Total	\$3,414	\$6,871	\$3,866	\$12,946
Amount expended for the School by the University, in excess of dental income; included in "University funds," and in "Capital expenditures," above. ("Rentals," below, are here accounted "dental income")	None	2,468	None	16,181
Excess of "rentals and interest," below, over "Direct appropriation" and "Capital expenditures," above	3,844	None	4,070	None
Average amount expended by the School per student (D.D.S.) per year	389	314	308	392
Average amount of all student fees paid to the School per student (D.D.S.) per year	255	192	203	210
<i>Details of current expenditures:</i> ²				
Rentals and interest on capital invested (paid to the University) ³	23,887	23,888	23,888	24,596
For repairs	446	446	447 ⁴	728
For research	None	None	None	None
For supplies used in the clinical departments	2,216	2,216	2,216	2,491
For salaries: for administration	4,840	4,840	4,840	5,740

¹ During the academic years 1920-24, there was no appropriation by the Province, and no income from endowment or gift; no money was borrowed; and there were no miscellaneous receipts. For the years 1920-23, some of the data are taken from a triennial report, and one-third of the totals is allotted to each of the three years.

² Reductions in the principal of the debt are included in "Rentals" among "Details of current expenditures."

³ "Rentals and interest on capital invested" includes the following specific items for the corresponding years:

For reduction in principal of debt	\$2,244	\$2,353	\$2,467	\$2,588
For interest on debt	3,027	2,918	2,803	2,683

⁴ The loss by fire in December, 1922, was covered by insurance.

DENTAL SCHOOLS IN CANADA

	(1)	(2)	(3)	(4)
Data for years ending on June 30	1920-21	1921-22	1922-23	1923-24
For salaries: for teaching	\$27,354	\$27,354	\$27,354	\$27,354
For all other purposes	3,101	3,101	3,103	13,156
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(14)	(14)	(14)	(16)
Amount of their salaries as teachers	23,194	23,194	23,194	23,194
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	4,800	4,800	4,800	4,800
Smallest salary paid to a whole-time teacher of a dental subject	3,600	3,600	3,600	3,600
(Number of teachers of academic or medico-dental subjects)	(9)	(9)	(9)	(9)
Amount of their salaries as teachers (including a proper allotment of university salaries for the instruction of dental students)	4,160	4,160	4,160	4,160
Largest salary paid to a whole-time teacher of an academic or medico-dental subject	(There were no whole-time teachers of these subjects)			
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University (the "allotment" referred to above)	None	None	None	None

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 27. Of this total number, none were whole-time, none half-time, and 9 part-time or occasional teachers of academic or medico-dental subjects; 4 were whole-time, 9 half-time, and 5 part-time or occasional teachers of dental subjects; 3 were whole-time teachers in the Dental School only; 7 were

STUDENTS AND GRADUATES: FACULTY OF DENTAL SURGERY, UNIVERSITY OF MONTREAL

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	138	158	164	203	208	195
Women.....	3	1	1	2	0	0
From countries other than Canada and Newfoundland; chiefly from France.....	0	0	18	17	20	1
Negroes.....	1	1	1	1	1	0
Attendance at the end of the year.....	134	155	159	197	201	189
Admitted by certificate ¹	0	0	0	0	0	0
Admitted to advanced standing.....	1	2	6	2	1	1
From other countries, to advanced standing.....	1	1	3	2	1	1
"Repeaters" of one or more subjects.....	3	2	5	7	8	7
Denied further instruction because of deficient scholarship.....	2	3	1	1	1	4
GRADUATES (D.D.S.)						
Total number of graduates.....	24	37	30	28	34	45
Women.....	2	2	0	0	0	0
Admitted to practice in countries other than Canada and Newfoundland.....	0	0	0	0	0	0
Negroes.....	1	1	1	1	1	0
	1919	1920	1921	1922	1923	1924
Number of provinces in which graduates took their first license examinations.....	No available data				1	2
Percentages of failures in provincial dental-board examinations.....	No available data				0	0

¹ All of the students are required to pass entrance examinations.

"full" professors; 17 were associate, assistant, or clinical professors; 1 was a lecturer by title; all received salaries; 6 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

No combined curricula leading to the degrees of B.S. or B.A., and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research: none in progress in 1924-25; no publication in 1924 or 1925

Systematic means employed to help to place licensed graduates in communities particularly in need of dental service: information obtained by correspondence with Mayors, parish priests, clergymen, and Boards of Trade is communicated to students and graduates

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: January, 1922; May, 1924

The foregoing data have been verified in detail by the Dean

SUMMARY

THIS School is the only one in North America that gives its instruction exclusively in French. For dentistry in Canada, it exacts the highest academic entrance requirement, which in respect of time is equal to that of the Rochester School in the United States. In 1929, when a baccalaureate will be a prerequisite for admission, the School's academic entrance requirement will become the very highest for dentistry. The laboratory of dental morphology has the appearance of an artist's studio, where the work shows special appreciation of esthetics in dental practice (page 131). At present the Faculty gives attention to the undergraduate curriculum only, and is inactive in research. The instruction in the medico-dental sciences is conducted without the coöperation of the Medical Faculty, although several of its members assist individually, but the work will be strengthened by a plan now under consideration to give the courses in anatomy and physiology in the medical laboratories. The correlations between clinical medicine and clinical dentistry are not so effectually presented as they might be under conditions of close accord between the Faculties of Medicine and Dentistry, and with suitable hospital facilities. The Medical School does not give formal instruction in oral health-service, but the prevention, treatment, and cure of diseases in other parts of the body are among the specialties designated in the curriculum. None of the teachers of dental subjects is included in the official register of instructors of medical students (1925-26).

Although the Infirmary receives a large number of patients annually, the fees for treatment are unusually small, the clinical service being strongly philanthropic. The School needs a large endowment, not only for the liquidation of the debt and for general maintenance, but also for special support during the period of declining attendance consequent upon the steady elevation of the entrance requirement; for the payment of higher salaries to most of the instructors, including a larger staff of whole-time teachers; for the development of coöperation between the Medical and Dental Faculties; and for the promotion of graduate work, the enlargement and improvement of the service of the library, and the advancement of research.

Comparative data relating to total attendance, proportion of students resident in the Province of Quebec, number of graduates, and classification of the total attendance, are given on page 616.

In 1924-25, of the 177 students in attendance, all except 9 were residents of the Province

of Quebec. Of the non-residents, 4 were from the United States, 3 from Ontario, and 2 from New Brunswick.

(2) FACULTY OF DENTISTRY, MCGILL UNIVERSITY

Location (medical building): on the site of the University; one-fourth mile from the centre of the city

General character: integral part of McGill University

Organized: as a separate Faculty, in 1919; a department of the Faculty of Medicine from 1906 to 1919. The Department was, in a sense, a continuation of the English Section of the Dental College of the Province of Quebec. (See the statement regarding the organization of the Faculty of Dental Surgery of the University of Montreal, page 605.) Consideration of plans for the continuance of the English Section was begun in 1903, but the Department could not be established before 1906. Its first graduates (three in 1908) received the degree of M.D.S. Since 1909 the degree has been D.D.S.

Buildings: two. The Faculty of Dentistry occupies half of the first floor of a wing of the medical building, which was erected in 1910; improvements were made in the dental section in 1920; total floor area used for special instruction in dentistry, 3300 sq. ft. The Dental Infirmary is situated in the Out-patient Department of the Montreal General Hospital (since 1908); it was remodeled and a wing added in 1921; total floor area of the Infirmary and accessory rooms, 5308 sq. ft. The Hospital is one and one-fourth miles from the medical (laboratory) building. Total floor area in both buildings used for special instruction in dentistry, 8608 sq. ft.

Infirmary: in the Montreal General Hospital, with twelve accessory rooms; total floor area, 5308 sq. ft. Total number of chairs in active use, 51, including groups reserved for special purposes: examination, extraction, and roentgenography, 1 each

Relation of the School of Medicine: the medico-dental subjects are taught in the medical building by members of the Medical Faculty; of these subjects, anatomy, bacteriology, histology, and physiology are taught to medical and dental students in the same classes. In 1924-25, teachers of medical subjects gave dental students instruction in clinical medicine; teachers of dental subjects did not give medical students instruction in clinical dentistry

Dispensary or Hospital, in addition to the Infirmary and general facilities in the Montreal General Hospital, in which dental students received accredited instruction, or performed stated clinical service, in 1924-25: none. In the General Hospital, in addition to the work in the Dental Infirmary, the dental students receive instruction in surgery, anesthesia, and roentgenography, and perform dental service in the wards

Number of dental internships or externships, held by officers or students of the School, in the Montreal General Hospital in 1924-25: none

Library (primarily medical, with a dental section): reading room, 2304 sq. ft.; stack room, 116,160 cu. ft.; four whole-time librarians. Contains 37,000 bound and 3000 unbound volumes, and pamphlets (all effectively card indexed). Of the volumes, approximately 500 relate to dental subjects

Library facilities additional to those in the medical building that are conveniently accessible to dental students: University Library; in active use

Scholarships, fellowships, or similar financial assistance received by dental students in 1924-25: none

Dean: whole-time officer; also Professor of Clinical Dentistry. *Associate Dean* (or equivalent officer): none. *Dean's executive assistant*: Assistant Superintendent of the Dental Clinic; whole-time officer

Minimum academic requirement for admission to the first-year class, in September, 1924. *For prospective practitioners in the Province of Quebec*: completion of at least two years of approved work in an accredited academic college; or its equivalent, as determined by examination conducted by the College of Dental Surgeons of the Province (in 1924 only). *For prospective practitioners in other Canadian provinces and in countries other than Canada*: certified compliance with the legal prerequisite, in general education, for a license in a given province or country (in 1924 only). Students admitted on this multiple standard were taught together

Latest advance in the minimum academic requirement for admission, in September, 1925: *For prospective practitioners in the Province of Quebec*: completion of at least two years of approved work under the Faculty of Arts of an accredited English University in this Province; to apply in 1926, also, and thereafter. *For prospective practitioners in other Canadian provinces and in countries other than Canada*: completion of one year of approved work in an accredited academic college; in 1926, and thereafter, two years of such work will be required. Students admitted on this double standard in 1925 were taught together

Number of graduates (1920-25): 124; average per year, for six years, 20. (Number for the Dental Department of the Faculty of Medicine, 1908-19—64; average per year, for twelve years, 5)

Average total attendance, per year (at the end of the year), for the past ten years (1916-25): 86; proportion from the Province of Quebec: 1922-23—58 per cent; 1923-24—60 per cent; 1924-25—61 per cent

Clinical service of the Dental School (at the Montreal General Hospital) in the instruction of students:

Number of persons treated: 1920-21—5066; 1921-22—6329; 1922-23—6551; 1923-24—5544; 1924-25—6679 (the figures are estimates)

Number of visits (sittings): 1920-21—15,199; 1921-22—18,988; 1922-23—19,654; 1923-24—16,643; 1924-25—20,037 (the figures are estimates)

Number of patients given dental treatment in the wards of the Hospital, by dental students: 1920-21—70; 1921-22—109; 1922-23—284; 1923-24—143; 1924-25—172

FINANCIAL DATA

Estimated value (Dental Infirmary) of building (wing), \$26,629, and equipment, \$22,371; total, \$49,000 (June 30, 1925). The estimated value of the dental equipment in the medical building is \$13,000. The value of the medical building and its equipment is \$1,750,000

General debt on the School, or carried by the University on the School's account (June 30, 1925): \$23,383, without interest

Data for years ending on May 31	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
<i>Current income</i> : ¹				
Appropriated by the City	\$1,000	\$1,000	\$1,000	\$1,000
Fees (all kinds) paid by the students	20,243	20,859	21,848	20,648
Fees paid by patients, in all clinical departments	6,014	10,589	13,342	12,344
Miscellaneous receipts	None	879	None	76
University funds, additional to the income designated above:				
(a) Direct appropriation	None	5,688	7,190	7,649
<i>Carried forward</i>	\$27,257	\$39,015	\$43,380	\$41,717

¹ During the academic years 1920-24, there was no appropriation by the Province, and no income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

DENTAL SCHOOLS IN CANADA

	(1)	(2)	(3)	(4)
Data for years ending on May 31	1920-21	1921-22	1922-23	1923-24
<i>Current income, brought forward</i> ¹	\$27,257	\$39,015	\$43,380	\$41,717
(b) Estimated amount of miscellaneous income available to the School as an integral part of the University, but not specified in the dental budget	25,239	30,253	28,710	30,501
Total amount of current income	\$52,496	\$69,268	\$72,090	\$72,218
<i>Total amount of current expenditures</i>	\$52,496	\$69,268	\$72,090	\$72,218
Amount expended for the School by the University, in excess of dental income, and included in "University funds," above, less repayment on account of debt	25,239	31,941	31,900	34,150
<i>Capital expenditures</i> (additional), by the University: ²				
For new construction	None	26,629	None	None
For new equipment	None	22,503	None	None
Average amount expended by the School per student (D.D.S.) per year	449	618	586	578
Average amount of all student fees paid to the School per student (D.D.S.) per year	173	186	178	165
<i>Details of current expenditures:</i>				
For reduction in principal of debt; paid to the University	None	4,000	4,000	4,000
For interest on debt	None	None	None	None
For rent ³	3,200	4,450	4,450	4,500
For repairs	21	15	98	52
For new equipment ⁴	1,156	288	486	452
For new construction (or land) ⁴	None	None	None	None
For research	None	None	None	None
For improvement of the library	None	157	17	161
For supplies used in the clinical departments	No available data		50	63
For salaries: for administration	5,600	6,000	6,300	6,300
For salaries: for teaching	27,296	33,634	38,428	37,442
For all other purposes	15,223	20,724	18,261	19,248
<i>Salaries for instruction:</i>				
(Number of teachers of dental subjects)	(19)	(20)	(21)	(21)
Amount of their salaries as teachers	9,796	14,634	18,928	17,642
Number of teachers of dental subjects who did not receive salaries	(None)	(None)	(None)	(None)
Largest salary paid to a whole-time teacher of a dental subject (exclusive of the Dean's salary)	1,488	2,500	2,750	2,700
Smallest salary paid to a whole-time teacher of a dental subject	1,000	1,000	1,000	1,500
(Number of teachers of academic or medico-dental subjects)	(12)	(14)	(17)	(17)

¹ During the academic years 1920-24, there was no appropriation by the Province, and no income from endowment or gift; no money was borrowed; and all miscellaneous receipts are included in the recorded items above.

² The cost of the construction and equipment of the remodeled and enlarged Infirmary; paid from funds loaned by the University and included in the School's indebtedness to the University.

³ The rental was paid to the Faculty of Medicine for the maintenance of the School's quarters in the medical building.

⁴ See "Capital expenditures," above.

	(1) 1920-21	(2) 1921-22	(3) 1922-23	(4) 1923-24
Data for years ending on May 31				
Amount of their salaries as teachers (including a proper allotment of university or medical salaries for the instruction of dental students)	\$17,500	\$19,000	\$19,500	\$19,800
Largest salary paid to a whole-time teacher of an academic or medico-dental subject (All members of the Medical Faculty)	7,000	7,000	7,000	7,000
Smallest salary paid to a whole-time teacher of an academic or medico-dental subject	750	750	750	700
Estimated proportionate share (for the Dental School) of the salaries of these teachers that was not included in the dental budget, but was paid by the University or from the medical budget (the "allotment" referred to above)	17,500	19,000	19,500	19,800

INSTRUCTION, RESEARCH, AND MISCELLANEOUS DATA

Number of teachers of dental students in 1924-25: total, 38. Of this total number, 16 were whole-time, none half-time, and 5 part-time or occasional teachers of academic or medico-dental subjects; 3 were whole-time, 7 half-time, and 7 part-time or occasional teachers of dental subjects; 3 were whole-time teachers of dental students only; 15 were "full" professors; 8 were associate, assistant, or clinical professors; 9 were lecturers by title; all received salaries; 23 were teachers with degrees other than, or additional to, D.D.S. or D.M.D., or took non-dental courses of college grade for at least one continuous academic year

No combined curricula leading to the degrees of B.S. or B.A., and D.D.S.; no course for dental mechanics, assistants, or technicians; no course for dental (oral) hygienists (nurses); no graduate course in dentistry; no advanced course for dental practitioners; no summer course in clinical dentistry; no dental extension teaching

Research: none in progress in 1924-25; no publication in 1924 or 1925

No systematic means have been employed to help to place licensed graduates in communities particularly in need of dental service

STUDENTS AND GRADUATES: FACULTY OF DENTISTRY, MCGILL UNIVERSITY

Total number (students or graduates) in each year	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
STUDENTS (D.D.S.)						
Maximum attendance.....	60	90	120	115	131	132
Women.....	0	1	0	0	1	1
From countries other than Canada.....	1	2	2	1	2	1
Negroes.....	0	0	1	1	1	1
Attendance at the end of the year.....	58	85	117	112	123	125
Admitted by certificate ¹	0	0	0	0	0	0
Admitted to advanced standing.....	1	0	1	2	4	15
From other countries, to advanced standing.....	1	0	1	0	0	0
"Repeaters" of one or more subjects.....	3	2	3	13	8	5
Denied further instruction because of deficient scholarship.....	2	1	2	7	3	3
GRADUATES (D.D.S.)						
Total number of graduates.....	8	15	14	7	32	16
Women.....	0	0	0	0	0	0
Admitted to practice in countries other than Canada	No available data					
Negroes.....	0	0	0	0	0	0
	1919	1920	1921	1922	1923	1924
Number of provinces in which graduates took their first license examinations.....	No available data					
Percentages of failures in such provincial dental board examinations.....	No available data					

¹ Before 1924 students were admitted only after passing examinations.

No effort has been made by the School to determine recurrently the quality of the instruction, as measured by the efficiency and success of the graduates in actual dental practice, or in other related professional service, such as teaching or research

Visited: January and October, 1922; May, 1924

The foregoing data have been verified in detail by the Dean

SUMMARY

This is the only dental school in North America that gives all of its clinical instruction in an associated hospital. This excellent arrangement, which despite the distance between the laboratory departments of the School and the Hospital is highly useful to both, favors close correlation between clinical dentistry and clinical medicine in the service for the patients in the Hospital and Infirmary, and in the instruction of the dental students. It could be made more serviceable if the number of patients treated in the wards by the dental students were larger, and if the Dental Infirmary were also used for the instruction of students of medicine in the general aspects of clinical dentistry. This plan might be adopted to very great advantage wherever hospitals, medical schools, and dental schools can be intimately coördinated, particularly in health centres such as those at Columbia University and Duke University, where all of the units are being rebuilt or created. In 1924 the Medical Faculty received \$500,000 from the Rockefeller Foundation "to establish a university clinic in the Department of Medicine at the Royal Victoria Hospital," which is closely affiliated with the University and located opposite the medical building. The Dental School does not have any teaching facilities in this important hospital, in the Out-patient Department of which, in 1924, a total of 56,809 cases were treated. Members of the Medical Faculty teach the dental students the required courses in the medico-dental subjects, of which those in anatomy, bacteriology, histology, and physiology are given to the dental and medical students in the same classes, despite important differences in preliminary education of the two groups. Enforcement of an entrance requirement of two years of approved work in an accredited academic college for all of the new dental students, beginning in 1926-27, will remove this disparity. The library in the medical building is one of the best in North America, but should have a much more useful dental section.

The Dental Faculty has been confining its attention to the undergraduate curriculum, and has not yet manifested the spirit of research as it is exemplified by the Medical Faculty and by other departments of the University. The fees paid by the students are unusually small, the charges paid by the patients relatively low, and the salaries for instruction inadequate. The School needs added income for the liquidation of its debt, and for general maintenance and development. Gifts for the support of scholarships for undergraduates would help the School to give to the province the needed quota of English-speaking practitioners. An adequate endowment would enable the School, favored as it is by close association with a leading medical school and having exceptional facilities in a great hospital, to become one of the most important centres for dental graduate study and research in North America. The Dean of the School is President of the American Association of Dental Schools (1925-26).

Although the Medical Faculty coöperates effectually with the Dental Faculty, the students of medicine do not receive formal instruction in any aspect of oral health-service, but the specialties relative to other parts of the head are given the conventional attention. This unconcern for oral conditions in the medical instruction is illustrated by the following quotation from the description of the courses in otolaryngology as published in the Announcement for 1925-26: "In the fourth year the students receive instruction in (a) the normal anatomy of the ear, nose, and throat, as exemplified in moist dissections, dried specimens, models, stereoscopic plates, and radiograms of normal conditions of the accessory sinuses of the nose and mastoid process; (b) the method of using the various instruments

GEOGRAPHICAL DISTRIBUTION OF THE DENTAL STUDENTS AT MCGILL UNIVERSITY : 1924-25

<i>Provinces (8) and foreign country (1)</i>	<i>First year</i> ¹	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
Alberta	0	0	2	2	4
British Columbia	0	0	1	2	3
New Brunswick	0	2	1	4	7
Nova Scotia	2	1	3	1	7
Ontario	0	2	4	3	9
Prince Edward Island	0	1	0	1	2
Quebec	7	19	16	25	67
Saskatchewan	1	0	2	2	5
United States	4	0	2	0	6
Total	14	25	31	40	110

for examining the ear, nose, and throat; (c) the usual tests for hearing; (d) the recognition of normal conditions of these special organs." There are no suggestions that the teeth also are relevant. None of the dentists in the Dental Faculty is registered in the medical Announcement for 1925-26 as a teacher of students of medicine.

At the University of Montreal nearly all of the dental students are residents of the Province of Quebec; at McGill less than two-thirds are resident. The data in the accompanying table show the geographical distribution of the dental students at McGill in 1924-25. Comparative data relating to total attendance, proportion of students resident in the Province of Quebec, number of graduates, and classification of the total attendance, are given on page 616.

GENERAL COMMENT

Of the two adjacent provinces, Ontario contains one dental school, New Brunswick none. Of the four contiguous American states, Maine, New Hampshire, and Vermont are without dental schools, but there are four in New York. The two schools in the Province of Quebec, although integral parts of universities, are dissimilar in their medical relationships, that of the University of Montreal being practically isolated in this regard, whereas the McGill School is intimately associated with the Medical Faculty and the Montreal General Hospital. The School of the University of Montreal lays more stress upon the academic preparation and on esthetics in dental technology. At the University of Montreal the instruction is given in French, at McGill in English.

The relative values of the two schools to the Province may be inferred from the data in the table on page 616. In each of the two schools since 1922-23, the total number of students, and the relative number from provinces other than Quebec, have decreased as the entrance requirements have been raised. It is very probable that the number of students in the dental school of each university will increase, after the stabilization of the pre-professional requirements. Generous financial support of both schools, to enable them to follow their ideals of service on their own plans of procedure, is the outstanding indication for the further advancement of dental education in the Province of Quebec.

The mature preference of the Canadian schools for the North American system of dental education, as contrasted with the European plan, was mentioned on page 210. Some of the difficulties associated with the organization of the McGill Dental School twenty years ago and with the selection of the professional degree to be awarded, owing to the attitude of the Medical Faculty, were intimated on page 216. At Alberta

¹The first group affected by the present entrance requirement.

DENTAL SCHOOLS IN CANADA

DATA PERTAINING TO THE DENTAL SCHOOLS IN THE
PROVINCE OF QUEBEC: 1919-26*Total attendance*

	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Montreal	155	159	197 ¹	208	194 ²	177	135 ³
McGill	85	117	112	131	133	110 ²	79
Total	240	276	309	339	327	287	214

Proportion of students resident in the Province of Quebec

Montreal	97	96	94	90	92	95	96
McGill	74	66	70	58	60	61	64

Number of graduates

Montreal	37	30	28	34	45	47 ¹	55 ⁴
McGill	15	14	7	32	16	40	28 ⁴
Total	52	44	35	66	61	87	83

Classification of the total attendance

	First year	Second year	Third year	Fourth year	Total
Montreal: 1922-23	52	61 ¹	46	49	208
1923-24	31 ²	46	59 ¹	58	194
1924-25	34	34 ²	45	64 ¹	177
1925-26	21 ³	22	37 ²	55	135
McGill: 1922-23	34	38	24	35	131
1923-24	33	33	46	21	133
1924-25	14 ²	25	31	40	110
1925-26	10	13 ²	28	28	79

the Dental School is an administrative department of the Medical School, but dentistry is accorded a separate educational status. At Dalhousie, McGill, Montreal, and Toronto the Dental Faculties are independent, the coöperation between the medical and dental teachers being intimate at Dalhousie, McGill, and Toronto, but almost non-existent at Montreal. Recently in Quebec, and here and there in the United States (page 5), there has been a revival of interest in the idea that dentistry should be converted into a specialty of the practice of conventional medicine, and also in the proposal that a full education in medicine and graduation with the M.D. degree should be made prerequisites to the study of dentistry. These views, although never approved in North America, have been discussed frequently during the past century. They were given earnest consideration throughout the present study. The reasons for the writer's dissent are indicated in the Introduction, and in Chapters VII and X, of this Bulletin. When dentistry, continuing its separate organization and its own system of training and practice, becomes the full service equivalent of an oral specialty of medicine, as is proposed on page 239, the public will have no interest in the technical question whether dentistry should be formally converted into a specialty of the practice of

¹ The first group affected by an entrance requirement of *one* year of approved work in an accredited academic college.

² The first group affected by an entrance requirement of *two* years of approved work in an accredited academic college.

³ The first group affected by the present entrance requirement of *three* years of approved work in an accredited academic college.

⁴ The number of seniors (December, 1925).

conventional medicine. But, in that day, physicians and dentists will easily agree either that the separation of medicine and dentistry into two autonomous professions has been so desirable that it should be continued, or so undesirable that union should be effected, and the ensuing decision will then be natural and assuredly useful. Meanwhile, dentistry in North America cannot profit from any new relationship which, by its forced requirements or its artificial character, would increase the difficulties of dental practice without assuring higher quality or greater excellence in the practitioner. Instead, dentistry, on the basis of its present independent organization, requires abundant opportunity, encouragement, and assistance fully to attain its normal stature and capabilities as a division of health service. Present dental leadership is clearly bringing about this very desirable growth.

SASKATCHEWAN

Population: 833,000. Number of dentists, 236; physicians, 512. Ratios: dentists to population, 1:3530; physicians to population, 1:1627; dentists to physicians, 1:2.2

Statutory requirements. *Dentistry*.—Preliminary education: sufficient for matriculation in a recognized university. Professional training: graduation from a dental school "recognized" by the University of Saskatchewan. *Medicine*.—Preliminary education: none. Professional training: graduation from an accredited medical school

Dental school: none; medical school: none

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Table 1

Table 1. Data from 1954-55 are given to the best of our knowledge and are based on the results of the survey of the 1954-55 season.

Table 2. Data from 1954-55 are given to the best of our knowledge and are based on the results of the survey of the 1954-55 season.

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INTRODUCTION

IN August, 1926, after detailed revision of this Bulletin to the end of Part VI, bound copies of the printer's proof of the foregoing pages were submitted to the deans of the American and Canadian dental schools, and to other advisers, for correction and criticism. Early in October, printed copies of Section A of this Appendix were similarly distributed to those most directly concerned. The volume was closed in December, 1926, with the completion of Section C (page 654).

Section A presents statistical information for 1924-26, relating to the dental schools in the United States and Canada, in extension of the data for 1920-24 in Part VI. Table 7 includes comparative data for attendance during 1925-26 (December) and 1926-27 (December). Tables 8 and 9 recapitulate some of the data in Part VI and in Tables 1-7. The tables, compiled from formal statements by the chief executive officers of the schools, have been prepared with as little deviation as possible from the original arrangement. The names of the schools are conveniently abbreviated and placed in alphabetic order to facilitate comparisons. Omitted from these tabulations, because the institutions are not directly comparable, are the graduate dental schools of the U. S. Army and the U. S. Navy, also the Forsyth Dental Infirmary for Children, and the Rochester Dental Dispensary, although all of them are included in Part VI.

The data have been presented in conformity with the conditions specified in the memoranda on pages 247-249. The Dean of each school has verified or corrected all of the statements affecting his institution.

In the tables, notes are indicated in the usual way by superscript numerals. For the first seven tables, the notes have been placed on even-numbered pages opposite the tables.

Section B, supplementing the facts and opinions presented on pages 1 to 617 in this Bulletin, suggests the most significant events at the schools during the calendar year 1926. Each school cooperated in the effort to indicate fully the developments during this period.

Section C consists of unclassified data. Errata are noted at its conclusion.

SECTION A

DATA FOR 1924-26 RELATING TO THE DENTAL SCHOOLS IN THE UNITED STATES AND CANADA

IN EXTENSION OF THE DATA FOR 1920-24 IN PART VI

The nine tables and the notes comprising Section A extend from page 622 to page 637, inclusive. To facilitate reference to the sections in Part VI relating to the individual schools, the corresponding initial page numerals are given in Table 1 and also in Table 7.

TABLE 1: NOTES

There are 43 dental schools in the United States and 5 in Canada (1924-25)

- ¹ The numerals in the first column are those of the pages of this Bulletin where the descriptions of the schools begin, and where data for previous years and in other relations may be compared.
- ² The numerals indicate the year of the school's organization, or of the reorganization into its status during 1924-25. Where reorganization or any new relationship has been chiefly nominal, or is unusual, the year of organization is given but the new "type" is indicated in the next column.
- ³ Abbreviations indicating the type of school: Ind = independent, but non-proprietary; P-as = a member of a group of associated professional schools; Prop = proprietary; U-af = affiliated with a university; U-as = associated with a university; U-i = integral part of a university.
- ⁴ The ratings are Class A, Class B, and Class C, as published by the Dental Educational Council of America on June 1, 1925. Blanks for schools in the United States signify rating postponed since 1923; in Canada, no rating by any authoritative body.
- ⁵ Abbreviations indicating minimum entrance requirement: H-S = graduation from a high school or the equivalent; C-1 = one year of approved work in an accredited academic college; C-2 = two years of approved work in an accredited academic college.
- ⁶ Length of service: whole-time, half-time, or part-time.
- ⁷ The "average attendance" includes the seniors at the end of the academic year for the last ten years (1916-25), or for the smaller number of years since organization or reorganization. The average for 1916-25, compared with the number of students in 1924-25, indicates the trend in attendance.
- ⁸ Given only where the property, if owned by the university or the school, is used chiefly or wholly by the school. Blanks signify that the school uses either property for which a rental is paid, or buildings devoted at a university or at a group of associated professional schools primarily to other purposes. For rental charges see Table 3.
- ⁹ The debt and the annual interest thereon, in most cases, are standing charges against current income.
- ¹⁰ Accumulated net assets can be given only for schools that are financially independent.
- ¹¹ Atlanta became non-proprietary in 1926.
- ¹² Atlanta, Loyola (New Orleans), and Ohio State were rated Class A in 1926.
- ¹³ Columbia and New York were rated Class B in 1926.
- ¹⁴ Georgetown, Temple, and Tulane began in 1925-26 to require C-1.
- ¹⁵ At Howard, Meharry, and Alberta the dental schools are administered under the direction of the chief executive officers of the medical schools.
- ¹⁶ Indiana, New York, and Toronto became integral parts of the universities at the end of 1924-25.
- ¹⁷ Loyola (Chicago) became an integral part of the University in 1926.
- ¹⁸ Marquette and Pittsburgh began in 1925-26 to require C-2.
- ¹⁹ Ohio College and Vanderbilt were discontinued at the end of 1925-26.
- ²⁰ The rating of the Ohio College has been withheld since 1923, pending completion of prospective reorganization as an integral part of the University of Cincinnati. See note 19.
- ²¹ Additional equipment has been supplied in the new building (1925-26).
- ²² In 1925-26 Washington lowered the minimum entrance requirement to H-S, but C-1 was restored in 1926-27.
- ²³ The debt at Western Reserve was written off by the Trustees at the end of 1925-26.
- ²⁴ The figures represent less than the full totals. See the note indicated at the head of the column.
- ²⁵ Before 1925-26 Alberta gave pre-clinical instruction only.
- ²⁶ For practitioners in provinces other than Quebec. In 1924-25 McGill began to require C-2 for practitioners in Quebec; in 1925-26, C-1 for practitioners in other provinces; in 1926-27, C-2 for all new students.
- ²⁷ In 1925-26 Montreal began to require C-3.

TABLE I: GENERAL DATA AND PROPERTY VALUES

School	General data								Estimated values of the property				
	Page ¹	Organized ²	Type ³	Rating ⁴	Entrance requirement ⁵	Dean (service) ⁶	Number of graduates since organization ²	Attendance ⁷ (end of year)		Land and buildings ⁸	Equip-ment	Amount of the general debt ⁹	Accumulated net assets ¹⁰
								Average 1916-25 ²	1924-25				
Schools in the United States													
Atlanta	310	1917	Prop ¹¹	B ¹²	H-S	Part	618	306	340	...	\$75,000	\$30,000	\$68,397
Baylor	555	1918	U-i	A	H-S	Part	176	126	174	\$80,000	83,200	None	...
Buffalo	444	1892	U-i	A	C-2	Part ¹	1,504	205	128	183,674	36,143	30,500	...
California	265	1881	U-i	A	H-S	Whole	1,276	292	385	204,289	117,184	24,233	...
Cincinnati (College)	491	1893	Prop	C	C-1	Whole	440	34	26	35,000	20,000	None	55,421
Columbia	453	1923	U-i	.. ¹³	C-2	Whole	253	451	371	365,591	60,654	112,500	...
Creighton	436	1905	U-i	A	H-S	Part	505	156	204	285,000	95,000	21,992	...
Denver	281	1922	U-i	B	H-S	Whole	127	162	176	40,000	25,000	10,000	...
Georgetown	288	1901	U-i	B	H-S ¹⁴	Part	406	127	147	...	20,000	None	...
Harvard	378	1867	U-i	A	C-1	Part	1,487	204	198	385,000	50,000	34,548	...
Howard	293	1884	U-i	B	C-1	None ¹⁵	674	175	90	20,000	20,000	None	...
Illinois	332	1913	U-i	A	C-1	Part	459	162	114	130,000	90,000	55,000	...
Indiana	340	1879	Prop ¹⁶	B	H-S	Half	2,062	270	368	...	60,205	64,000	30,600
Iowa	345	1882	U-i	A	C-1	Half	1,754	251	211	270,000	230,000	None	...
Kansas City	411	1919	Ind	B	H-S	Whole	383	333	415	...	102,270	22,400	85,319
Louisville	353	1918	U-i	A	C-1	Part	230	127	124	85,000	31,053	52,733	...
Loyola (Chicago)	317	1884	U-af ¹⁷	A	H-S	Part	4,614	473	624	282,000	102,937	None	518,395
Loyola (New Orleans)	363	1914	U-i	B ¹²	H-S	Part	95	45	61	...	50,000	None	...
Marquette	573	1912	U-i	A	H-S ¹⁸	Half	1,037	422	553	330,000	115,000	275,000	...
Maryland	369	1920	U-i	B	H-S	Half	321	231	480	125,000	60,298	7,500	...
Meharry	549	1915	P-as	B	C-1	None ¹⁹	514	233	183	100,000	25,000	None	...
Michigan	395	1875	U-i	A	C-1	Whole	2,584	352	326	400,000	150,000	None	...
Minnesota	402	1888	U-i	A	C-1	Whole	1,681	370	359	138,000	62,728	None	...
Nebraska	431	1918	U-i	B	C-1	Whole	158	98	80	...	17,000	6,146	...
New York	449	1865	Ind ¹⁶	.. ¹³	C-1	Whole	4,375	692	558	203,030	62,734	None	318,630
North Pacific	508	1898	P-as	A	H-S	Whole	1,504	407	468	239,500	86,886	182,000	144,386
Northwestern	324	1891	U-i	A	C-1	Half	4,650	472	215	...	150,000	None	...
Ohio College ¹⁹ (Cincinnati)	486	1845	U-af	.. ²⁰	C-1	Half	2,497	142	158	50,000	86,075	None	168,497
Ohio State (Columbus)	500	1914	U-i	B ¹²	C-1	Whole	388	151	141	...	45,000	None	...
Pennsylvania	514	1878	U-af	A	C-1	Whole	5,149	642	428	786,432	274,799	None	1,897,793
Pittsburgh	526	1905	U-i	A	H-S ¹⁸	Whole	1,352	533	1,038	400,000	140,000	80,000	...
St. Louis	423	1908	U-i	A	H-S	Whole	887	246	341	189,775	38,524	None	...
San Francisco ("P and S")	273	1923	Ind	B	H-S	Half	133	334	348	...	40,830	42,064	96,510
Southern California	258	1897	U-as	A	H-S	Whole	1,113	357	600	493,475	95,817	83,400	729,814
Temple	521	1907	U-i	B	H-S ¹⁴	Part	890	266	568	...	65,000	147,100	...
Tennessee	539	1878	U-i	A	C-1	Whole	653	71	85	...	45,000	None	...
Texas	560	1905	Prop	C	H-S	Part	244	63	93	...	18,000 ²¹	None	14,000
Tufts	384	1899	U-i	A	C-1	Whole	1,840	387	204	...	59,190	156,000	...
Tulane	359	1909	U-i	B	H-S ¹⁴	Half	337	90	105	...	21,807	None	...
Vanderbilt ¹⁹	543	1879	U-i	A	C-1	Part	1,539	132	141	29,825	16,945	None	...
Virginia	566	1913	P-as	A	C-1	Whole	230	87	55	...	9,443	41,666	...
Washington	417	1892	U-i	A	C-1 ²²	Part	1,001	89	38	71,146	24,641	None	...
Western Reserve	495	1892	U-i	A	C-1	Part	1,006	180	142	183,400	63,008	229,025 ²³	...
Total	...	...	29 U-i	24 A	20 H-S	18 Whole	53,146 ²⁴	10,946	11,863	6,105,137 ²⁴	3,042,371	1,707,807	4,127,762
Average	...	...	...	...	...	...	...	255	276	...	70,753	39,716	...
Schools in Canada													
Alberta	583	1918	U-i	..	C-1	None ¹⁵	.. ²⁵	29	34	...	\$7,200	None	...
Dalhousie	590	1912	U-i	..	C-1	Part	85	40	33	...	27,000	None	...
McGill	610	1919	U-i	..	H-S ²⁶	Whole	124	86	110	\$26,629	35,371	\$23,383	...
Montreal	605	1920	U-i	..	C-2 ²⁷	Whole	187	182	165	292,500	98,064	51,835	...
Toronto	596	1875	U-af ¹⁶	..	C-1	Whole	2,771	561	371	375,000	100,000	61,005	\$494,000
Total	...	...	4 U-i	..	1 H-S	3 Whole	3,167	898	713	694,129	267,635	136,223	494,000
Average	...	...	...	...	...	...	633	180	143	...	53,527	27,245	...

TABLE 2 : NOTES

There are 43 dental schools in the United States and 5 in Canada (1924-25)

- 1 "Current income" occasionally includes funds paid by universities to meet expenses in excess of ordinary income. In such instances there are no recorded deficits, but the sums thus used to balance accounts are included in those in the column headed: "Paid by the university in excess of dental income."
- 2 In most of the universities, where the finances of the schools are conducted on a budget system, various types of capital expenditure are made from the appropriations for expenses, and are included in the totals for "Current expenditures."
- 3 "Paid by the university in excess of dental income" includes not only actual payments and deficits but also the monetary value of advantages for the school that were derived from its relation to the university, as estimated by the school. In some cases these amounts appear to be overestimated; in others they are obviously too low. Compare this total amount with those in the last two columns under current income "From the university" (direct and also estimated). A blank in the fifth column signifies that the school is independent. See note 5.
- 4 The income from several endowment funds, now being accumulated from profits, was added to the principal and not used as current income.
- 5 Compare these amounts with those "Paid by the university in excess of dental income" (fifth column). "Salaries for instruction paid by the university additional to dental budget," in Table 4, third column, are included in the items of the last column in this table.
- 6 Includes borrowed funds: Denver, \$3500; Toronto, \$19,207.
- 7 The current financial data for Indiana's last year under the proprietary régime could not be obtained, but through the courtesy of the University the items for the first year under university control (1925-26) are given instead. These are similar to the data for 1924-25.
- 8 This amount includes a nominal charge of \$30,000 for rental.
- 9 The current financial data for Loyola (Chicago) are those of the calendar year 1924. The Dean declined all invitations to present data for 1924-25 or for 1925, the first year in affiliation with the University. See footnote 2, on page 320.
- 10 Includes a special budget allowance of \$15,000, which was not expended until 1925-26.
- 11 The New York College of Dentistry was united with New York University at the end of 1924-25.
- 12 An unpaid charge of \$42,000 for rental is included.
- 13 Fees amounting to \$20,290, paid by practitioners and graduate students, are included.
- 14 Includes \$3000 appropriated to the University by the state.
- 15 The debt written off by the University in 1926 (page 652) includes this deficit.
- 16 At Alberta there was no clinical instruction before 1925-26.
- 17 Includes \$2462 paid by the Montreal General Hospital.
- 18 Of this amount \$2200 was appropriated to the University by the Province of Quebec.
- 19 The affiliated school became an integral part of the University of Toronto at the end of 1924-25.

TABLE 2: CURRENT FINANCES—GENERAL SUMMARY AND DETAILS OF INCOME

School	General summary of current finances					Details of current income						
	Current income ¹	Current expenditures ²	Net income	Deficit ¹	Paid by the university in excess of dental income ³	Fees paid by		Endowment ⁴	Gifts	Miscellaneous	From the university ⁵	
						Students	Patients				Direct	Estimated
Schools in the United States												
Atlanta	\$119,233	\$99,706	\$19,527	...	...	\$78,351	\$34,520	None	None	\$6,362	...	...
Baylor	90,467	86,066	4,401	...	\$17,549	39,729	28,534	None	None	254	None	\$21,950
Buffalo	112,948	112,948	None	None	57,713	41,483	12,215	None	None	1,537	\$57,713	None
California	192,456	195,152	...	\$2,696	12,156	88,219	71,128	\$589	\$19,495	869	12,156	None
Cincinnati (College)	16,319	15,628	691	...	...	5,865	10,454	None	None	None	...	...
Columbia	238,900	238,900	None	None	67,777	126,483	30,985	6,550	None	8,005	47,777	20,000
Creighton	76,949	76,949	None	None	439	39,513	28,997	None	8,000	None	439	None
Denver	71,538	76,087	...	4,549	None	36,602	30,020	None	None	4,916 ⁶	None	None
Georgetown	60,368	56,218	4,150	...	16,433	31,260	8,301	None	None	224	None	20,583
Harvard	89,084	107,033	...	17,949	None	45,696	33,632	9,500	52	204	None	None
Howard	34,530	34,530	None	None	14,498	16,464	3,568	None	None	None	8,498	6,000
Illinois	148,448	148,448	None	None	113,400	18,286	14,975	None	None	787	71,571	42,829
Indiana ⁷	111,325	95,199	16,126	...	None	84,544	26,210	None	None	571	None	None
Iowa	177,600	177,600	None	None	113,519 ⁸	37,773	26,308	None	None	None	37,219	76,300 ⁹
Kansas City	168,067	132,710	35,357	...	...	100,735	63,503	None	None	3,829	...	...
Louisville	84,567	84,567	None	None	24,243	35,026	21,704	None	None	3,594	19,818	4,425
Loyola ⁹ (Chicago)	289,336	254,702	34,634	...	None	157,405	127,204	None	None	4,727	None	None
Loyola (New Orleans)	37,855	31,549	6,306	...	3,694	14,249	6,606	None	7,000	None	None	10,000
Marquette	220,200	182,493	37,707	...	None	136,076	76,624	None	2,500	None	None	5,000
Maryland	186,630	134,726	51,904 ¹⁰	...	None	130,099	40,710	None	None	821	15,000	None
Meharry	53,385	52,190	1,195	...	15,505	32,993	3,692	None	None	None	None	16,700
Michigan	275,936	275,936	None	None	182,895	70,069	21,172	None	1,800	None	27,895	155,000
Minnesota	247,139	247,139	None	None	120,988	77,610	48,541	None	None	None	18,849	102,139
Nebraska	57,850	57,850	None	None	30,068	10,993	16,789	None	None	None	None	30,068
New York ¹¹	256,614	245,916	10,698	...	...	162,130	84,646	None	None	9,838	...	...
North Pacific	178,934	174,752	4,182	...	...	119,819	57,873	None	None	1,242	...	...
Northwestern	248,636	248,636	None	None	84,615 ¹²	64,084	60,852	610	9,000	29,495 ¹³	42,615	42,000 ¹⁴
Ohio College (Cincinnati)	57,511	61,593	...	4,082	None	38,048	16,517	None	None	2,946	None	None
Ohio State (Columbus)	77,232	77,232	None	None	44,468	22,296	10,468	None	None	None	28,468	16,000
Pennsylvania	192,430	242,359	...	49,929	None	121,140	33,482	34,952	None	2,856	None	None
Pittsburgh	356,824	356,824	None	None	8,081	246,715	95,028	200	3,800	None	11,081 ¹⁴	None
St. Louis	169,276	161,932	7,344	...	12,656	86,419	62,373	None	None	484	None	20,000
San Francisco ("P and S")	148,451	96,282	52,169	...	...	74,501	68,880	None	None	5,070	...	...
Southern California	275,804	225,570	50,234	...	None	159,383	112,921	None	None	3,500	None	None
Temple	139,969	110,402	29,567	...	None	118,793	21,177	None	None	None	None	None
Tennessee	73,901	73,901	None	None	48,466	12,870	12,575	None	None	None	8,680	39,776
Texas	19,397	11,897	7,500	...	...	16,365	3,032	None	None	None	...	...
Tufts	109,149	109,149	None	None	35,713	47,930	25,446	None	None	60	35,713	None
Tulane	59,814	59,814	None	None	22,428	20,764	15,514	None	None	1,108	3,163	19,265
Vanderbilt	58,574	57,446	1,128	...	8,872	32,662	15,862	None	None	50	None	10,000
Virginia	68,171	68,171	None	None	46,985	14,536	6,650	None	None	None	46,985	None
Washington	37,857	37,857	None	None	21,876	7,880	8,101	None	None	None	18,376	3,500
Western Reserve	138,849	164,393	...	25,544 ¹⁵	60,000	36,744	41,505	None	None	600	None	60,000
Total	\$5,828,543	\$5,558,472	\$274,820	\$104,749	\$1,185,027	\$2,858,602	\$1,538,394	\$52,401	\$51,647	\$93,949	\$512,016	\$721,535 ²
Average	135,548	129,267	...	...	...	66,479	35,777	1,219	1,201	2,185	...	...
Schools in Canada												
Alberta	\$26,016	\$26,016	None	None	\$22,876	\$3,140	...	None	None	None	\$4,126	\$18,750
Dalhousie	23,261	23,261	None	None	13,917	6,513	\$2,548	None	\$175	\$108	None	13,917
McGill	84,940	84,940	None	None	51,988	17,996	12,432	None	None	2,524 ¹⁷	10,147	41,841
Montreal	73,880	73,880	None	None	9,530	37,255	3,980	None	None	None	32,645 ¹⁸	None
Toronto ¹⁹	135,200	135,200	None	None ⁶	None	75,869	36,345	None	None	22,986 ⁶	None	None
Total	\$343,297	\$343,297	None	None	\$98,311	\$140,773	\$55,305	None	\$175	\$25,618	\$46,918	\$74,508
Average	68,659	68,659	...	...	...	28,155	11,061	...	35	5,124	...	...

TABLE 3: NOTES

There are 43 dental schools in the United States and 5 in Canada (1924-25)

*The asterisk indicates that the school has no available data.

¹The expenditures for clinical supplies bear a direct relation to the scope and character of the work in the infirmary. See the data for clinical service in Table 5.

²At some of the schools, executives whose duties include teaching are paid general salaries for the combined service. In such cases the recorded apportionments between administration and instruction are estimated by the school.

³For the university schools the total "For all other purposes" includes the equivalent of a portion of the estimated amount of additional current income specified in the last column of Table 2, which, as is explained in note 3 for Table 2, was largely the estimated monetary value of advantages accruing from the relationship with the university.

⁴Paid from capital income, and excluded from the calculation of the item in the last column. See note 2, Table 2.

⁵Paid mainly from the Carnegie Corporation's gift to the University of California for the support of research in stomatology (page 272).

⁶For repairs and new equipment, the accounts having been combined.

⁷See footnote 3, on page 334.

⁸The recorded amount for rental at Iowa is a nominal value, which is also included in the estimated amount of income "From the University," in the last column of Table 2. No rental is charged or paid at Iowa.

⁹The rental was paid for minor facilities used in property not owned by the University.

¹⁰See note 2. The amount for teaching at Michigan is exceptionally large because it includes related expenditures in support of instruction, and also salaries for administration, that the Dean is unwilling to estimate separately.

¹¹See footnote 2, on page 327.

¹²This total amount, excluding the recorded payments from capital income, was only \$44,818.

¹³"Rentals and interest on capital invested"; as originally recorded, it included the items for reduction in the principal of the debt and for interest on the debt, \$2714 and \$2557, respectively.

TABLE 3: DETAILS OF CURRENT EXPENDITURES

School	Details of current expenditures											For all other purposes ³
	On account of debt		Rent	Repairs	New equipment	New construction or land	Research	Library in dental building	Clinical supplies ¹	Salaries		
	Principal	Interest								Administrative ²	Teaching ²	
Schools in the United States												
Atlanta	None	\$1,240	\$7,680	\$576	\$940 ⁴	\$50,100 ⁴	\$109	\$200 ⁴	\$8,330	\$11,200	\$38,312	\$31,659
Baylor	None	None	None	1,039	1,430	None	None	912	16,127	8,020	48,981	9,567
Buffalo	None	1,525	None	402	744	None	None	556	3,933	13,292	80,775	11,721
California	None	1,465	None	None	3,883	2,358	16,294 ⁵	500	*	8,549	94,288	67,825
Cincinnati (College)	None	None	None	None	None	None	None	None	2,486	6,820	4,050	2,272
Columbia	None	None	None	None	None	8,250	2,000	1,500	26,000	21,480	119,620	60,050
Creighton	\$6,584	1,500	None	928	206	None	2,500	276	8,048	7,889	33,641	15,377
Denver	None	None	2,400	1,737	2,603	None	None	240	9,764	5,750	33,306	20,287
Georgetown	None	None	None	676 ⁶	...	None	None	50	3,689	2,442	21,311	28,050
Harvard	None	830	None	1,770	2,406	None	2,500	396	11,435	6,233	43,275	38,188
Howard	None	None	None	*	*	None	None	None	2,819	*	26,711	5,000
Illinois	None	3,600	None	314	1,478	None	* ⁷	None	9,683	8,176	74,006	51,191
Indiana	None	None	15,000	None	1,085	None	None	None	10,667	8,387	35,405	24,655
Iowa	None	None	30,000 ⁸	None	3,000	None	3,000	700	18,000	9,710	98,035	15,155
Kansas City	9,700	1,647	22,355	2,845	7,756	None	None	None	17,343	9,800	35,954	25,310
Louisville	6,473	3,258	None	5,906	1,622	None	None	416	9,143	4,500	37,007	16,242
Loyola (Chicago)	None	None	None	27,389 ⁹	...	None	2,234	914	59,247	9,676	87,776	67,466
Loyola (New Orleans)	None	None	None	150	265	None	None	250	1,682	2,800	11,606	14,796
Marquette	None	18,875	4,690 ⁹	483	832	13,323	None	1,091	22,685	13,025	66,633	40,856
Maryland	3,750	390	5,000 ⁹	1,432	6,352	1,865	None	53	9,612	14,893	61,135	30,244
Meharry	None	None	None	1,200	4,500	3,000	None	200	3,443	8,000	27,307	4,540
Michigan	None	None	None	*	*	*	6,700	1,200	11,708	* ¹⁰	246,000 ¹⁰	10,328
Minnesota	None	None	None	2,000 ⁶	...	None	None	197	45,000	26,275	135,082	38,585
Nebraska	1,787	476	3,900	140	174	None	None	None	4,238	7,241	38,044	1,850
New York	45,000 ⁴	900	None	7,017	911	16,022	None	None	21,823	17,274	111,734	70,235
North Pacific	7,000	12,768	None	3,038	6,511	None	None	437	17,681	12,790	74,631	39,896
Northwestern	None	None	42,000 ¹¹	602	None	None	2,683	4,539	21,603	19,284	73,029	84,916
Ohio College (Cincinnati)	None	None	5,700	450	1,075	None	250	275	5,489	8,267	32,938	7,149
Ohio State (Columbus)	None	None	None	357	18,743	168,000 ⁴	1,000	500	5,581	4,200	42,100	4,751
Pennsylvania	None	None	None	10,509	500	None	800	500	30,194	34,714	139,826	25,316
Pittsburgh	None	4,800	None	12,474	6,217	None	1,000	3,382	38,632	9,750	178,958	101,611
St. Louis	10,500	None	None	978	1,144	None	None	600	14,751	16,866	67,980	49,113
San Francisco ("P and S")	2,972 ⁴	2,608	7,200	2,100	8,640 ⁴	11,150 ⁴	None	122	16,489	4,050	37,847	25,866
Southern California	None	4,399	None	6,400	4,918 ⁴	87,598 ⁴	None	1,414 ⁴	18,561	18,035	109,062	69,113
Temple	None	8,584	250 ⁹	6,055	7,778	None	None	467	7,695	5,900	62,600	11,073
Tennessee	None	None	None	1,001	8,052	None	300	1,500	6,415	6,680	45,676	4,277
Texas	None	None	1,800	None	None	None	None	None	2,400	1,565	3,133	2,999
Tufts	None	3,945	3,915	2,391	None	None	None	475	12,677	4,275	46,768	34,703
Tulane	None	None	None	None	5,949	None	None	136	5,661	8,163	34,325	5,580
Vanderbilt	None	None	None	661	72	None	None	209	4,121	3,840	39,200	9,343
Virginia	None	2,500	None	3,146	1,235	None	None	868	4,024	3,849	32,554	19,995
Washington	None	None	None	1,091	333	None	None	126	3,022	2,200	24,585	6,500
Western Reserve	None	14,749	None	1,376	None	None	None	142	17,646	10,050	78,854	41,576
Total	\$93,766	\$90,049	\$151,890	\$108,633	\$111,354	\$361,666 ¹²	\$41,370	\$25,343	\$570,147	\$405,910	\$2,794,060	\$1,245,216
Average	2.181	2.094	3.532	2.526	2.590	...	962	589	13.259	9.440	63.583	28.959
Schools in Canada												
Alberta	None	None	None	None	None	None	None	\$100	...	\$1,200	\$16,150	\$8,568
Dalhousie	None	None	None	None	\$60 ⁶	...	None	50	\$1,196	1,933	14,933	5,089
McGill	\$4,000	None	\$4,450	None	\$850	None	None	33	14,896	6,300	40,353	14,059
Montreal	2,714	\$2,567	19,403 ¹³	898	1,437 ⁴	None	None	122 ⁴	2,602	7,359	35,545	2,802
Toronto	None	2,647	None	1,531	943	None	None	127	13,672	13,712	78,549	24,019
Total	\$6,714	\$5,204	\$23,853	\$2,489	\$3,230	None	None	\$432	\$32,365	\$30,504	\$185,530	\$54,535
Average	1.343	1.041	4.771	498	646	...	...	86	6.473	6.101	37.106	10.907

TABLE 4 : NOTES

There are 43 dental schools in the United States and 5 in Canada (1924-25)

¹ The arbitrary distinction between "Dental subjects" and "Academic or medico-dental subjects" is indicated on page 249.

² The amount of salaries for instruction "Paid by the university additional to dental budget" is included in the amount of estimated income in the last column of Table 2.

³ Recent discussions of the importance of research have stimulated superficial attention to it. The plus sign is inserted wherever at least one publication by a teacher of a dental subject could reasonably be regarded as a contribution to research. In a large proportion of these cases the contributions were routine in character, and lacked originality in conception and procedure.

⁴ An independent school in 1924-25; or, in the case of North Pacific, practically independent.

⁵ All of the teachers at the proprietary Cincinnati College gave instruction in both main types of subjects. The total of the honoraria is arbitrarily placed under "Dental subjects."

⁶ Several teachers gave instruction in both types of subjects: at Loyola (Chicago), 7 in addition to the number indicated in the groups; at Northwestern, 3 who were counted twice in the groups, but not in the general total.

⁷ This amount includes related expenditures, in support of instruction, that the Dean does not wish to estimate separately.

⁸ There were publications of results of dental research under private auspices at the Medical School. See footnote 4, page 404.

TABLE 4: SALARIES FOR INSTRUCTION; CLASSIFICATION OF TEACHERS; RESEARCH

School	Details of salaries for instruction			Classification of teachers (extent of service)										Research: ³ Publication	
	Subjects ¹		Paid by the university additional to dental budget ²	Total number	Academic or medico-dental subjects				Dental subjects				Whole-time in dental school only	1924	1925
	Dental ¹	Academic or medico-dental ¹			Whole	Half	Part	Total	Whole	Half	Part	Total			
Schools in the United States															
Atlanta	\$27,262	\$11,050	...	34	3	2	6	11	8	3	12	23	11	-	+
Baylor	27,180	21,801	\$17,950	51	14	7	7	28	6	2	15	23	6	-	-
Buffalo	45,285	35,490	None	59	15	0	13	28	5	0	26	31	4	-	-
California	75,988	18,300	None	103	0	0	11	11	15	11	66	92	13	+	+
Cincinnati (College)	4,050	None ⁵	...	15	...	...	...	...	2	4	9	15	2	-	-
Columbia	71,450	48,170	15,000	85	1	6	24	31	3	22	29	54	4	+	+
Creighton	24,975	8,666	None	39	5	1	13	19	5	5	10	20	8	+	+
Denver	23,831	9,475	None	36	7	0	11	18	9	2	7	18	9	-	-
Georgetown	12,955	8,356	None	56	6	0	10	16	2	0	38	40	2	-	-
Harvard	35,475	7,800	None	154	26	0	12	38	2	6	108	116	2	+	+
Howard	17,500	9,151	6,000	29	6	5	5	16	5	5	3	13	4	-	-
Illinois	61,471	12,535	6,000	54	2	0	17	19	16	2	17	35	16	+	+
Indiana	26,680	8,725	None	42	0	0	15	15	8	5	14	27	8	-	-
Iowa	75,735	22,300	22,300	46	0	3	18	21	22	2	1	25	22	-	-
Kansas City	28,859	7,095	...	36	1	1	14	16	6	5	9	20	7	-	-
Louisville	23,402	13,605	2,000	43	7	3	3	13	7	0	23	30	7	+	+
Loyola (Chicago)	56,391	31,385	None	46 ⁶	2	3	6	11	10	6	12	28	15	-	+
Loyola (New Orleans)	6,606	5,000	3,000	32	6	6	4	16	0	4	12	16	0	-	-
Marquette	41,992	24,641	None	56	6	2	11	19	9	1	27	37	9	-	-
Maryland	38,510	22,625	None	54	2	1	19	22	7	4	21	32	9	-	-
Meharry	19,807	7,500	None	48	14	8	8	30	7	2	9	18	7	-	-
Michigan	97,135	148,865 ⁷	148,865 ⁷	68	18	0	19	37	14	14	3	31	14	+	+
Minnesota	78,225	56,857	56,857	110	39	0	4	43	5	3	59	67	5	- ⁸	- ⁸
Nebraska	24,213	13,831	13,831	29	11	0	3	14	4	1	10	15	4	-	-
New York	74,366	37,368	...	62	2	6	3	11	10	33	8	51	12	+	+
North Pacific	47,854	26,777	...	53	8	5	14	27	13	3	10	26	14	-	-
Northwestern	53,086	19,943	None	61 ⁶	3	0	12	15	10	11	28	49	12	+	+
Ohio College (Cincinnati)	16,563	16,375	None	29	1	7	4	12	6	2	9	17	6	-	-
Ohio State (Columbus)	30,100	12,000	12,000	35	17	0	0	17	4	5	9	18	4	-	-
Pennsylvania	105,826	34,000	None	77	9	1	12	22	8	34	13	55	9	+	+
Pittsburgh	134,313	44,645	None	102	8	8	11	27	39	18	18	75	46	-	-
St. Louis	25,880	42,100	12,500	74	11	0	34	45	10	5	14	29	10	+	-
San Francisco ("P and S")	26,627	11,220	...	73	2	1	15	18	4	3	48	65	6	+	-
Southern California	74,198	34,864	None	65	7	1	15	23	24	3	15	42	31	-	-
Temple	54,000	8,600	None	49	2	4	4	10	5	13	21	39	5	-	+
Tennessee	26,710	18,966	18,966	41	11	2	4	17	7	3	14	24	7	-	-
Texas	3,133	None	...	27	0	1	6	7	0	0	20	20	0	-	-
Tufts	38,600	8,168	None	131	7	0	22	29	6	14	82	102	6	-	+
Tulane	8,525	25,800	19,265	49	0	1	29	30	0	5	14	19	0	-	-
Vanderbilt	24,800	14,400	10,000	35	4	2	6	12	10	3	10	23	10	-	-
Virginia	19,290	13,264	None	38	15	1	2	18	3	2	15	20	4	-	+
Washington	16,250	8,335	3,500	27	8	0	1	9	3	2	13	18	3	-	-
Western Reserve	28,440	50,414	31,350	42	12	0	7	19	4	7	12	23	4	-	-
Total	\$1,753,598	\$980,462	\$399,384	2,395 ⁶	318	88	454	860	343	275	913	1,531	377	12+	15+
Average	40,781	22,801	...	56	7	2	11	20	8	6	21	36	9	...	...
Schools in Canada															
Alberta	\$3,945	\$12,205	\$12,205	44	12	2	28	42	0	2	0	2	0	-	-
Dalhousie	6,940	7,993	7,993	42	16	4	4	24	2	1	15	18	2	-	-
McGill	20,553	19,800	19,800	38	16	0	5	21	3	7	7	17	3	-	-
Montreal	31,385	4,160	None	27	0	0	9	9	4	9	5	18	3	-	-
Toronto	62,902	15,647	None	70	1	2	19	22	6	24	18	48	6	+	+
Total	\$125,725	\$59,805	\$39,998	221	45	8	65	118	15	43	45	103	14	1+	1+
Average	25,145	11,961	...	44	9	2	13	24	3	9	9	21	3	...	...

TABLE 5 : NOTES

There are 43 dental schools in the United States and 5 in Canada (1924-25)

- *The asterisk signifies that the school has no available data.
- ¹The plus sign indicates that a curriculum or course was offered; the minus sign shows that it was not.
- ²In most instances the instruction of dental students in the hospitals is optional, nominal, or perfunctory.
- ³Number of operations, sittings, or treatments, where visits cannot be given, is indicated by italic.
- ⁴An independent school.
- ⁵At California graduate courses have been begun (1925-26).
- ⁶A school in a university that does not have a medical school, or which conducts a medical school in a city other than that in which the dental school is located.
- ⁷Since the school became an integral part of the University, in June, 1925, the Medical Faculty coöperates in giving the instruction in the medico-dental subjects.
- ⁸Data relating to two infirmaries.
- ⁹At Nebraska the courses for dental mechanics have been discontinued (1925-26).
- ¹⁰At North Pacific there were students in the courses for assistants but none in those for dental mechanics.
- ¹¹North Pacific College of Oregon has a School of Pharmacy but not a medical school.
- ¹²At Pittsburgh courses for dental assistants have been established (1925-26).
- ¹³At San Francisco ("P and S") combined academic and professional curricula are now available (1925-26).
- ¹⁴At Tennessee curricula for dental hygienists have been organized (1925-26).
- ¹⁵At Texas the new building, occupied in 1925-26, contains a larger infirmary and a greater number of chairs.
- ¹⁶The instruction of dental students in the laboratories of the Medical School was discontinued in 1925-26; at Vanderbilt the Dental School was closed in June, 1926 (page 651).
- ¹⁷In the table on page 140, this numeral is 7, the plus mark for Illinois having been omitted. See errata, on page 663.
- ¹⁸Alberta gave no clinical instruction in dentistry before 1925-26.
- ¹⁹At Toronto the course for dental assistants is primarily one for dental nurses, who are distinguished from dental hygienists.

TABLE 5: CURRICULA; MEDICAL COÖPERATION; INFIRMARY; CLINICAL SERVICE

School	Curricula or courses offered in addition to the curriculum for the degree of D.D.S. or D.M.D. ¹							Medical co-operation		School's infirmary and accessory rooms		Clinical service in the practical instruction of dental students			
	Combined academic and professional	Graduate for higher degree	Advanced for practitioners	For dental hygienists	For mechanics, assistants, technicians	Summer: clinical	Extension	Medico-dental subjects taught chiefly by members of the medical faculty	Accredited instruction given in one or more hospitals ²			School's infirmary: Patients treated		Hospitals: Patients treated by dental students no.	
										Persons no.	Visits no. ³				

Schools in the United States

Atlanta	-	-	-	-	-	+	-	... ⁴	-	6,175	90	9,728	27,813	None
Baylor	+	-	-	-	-	-	-	+	+	4,824	61	7,291	21,912	702
Buffalo	-	-	-	-	-	+	-	+	+	4,435	58	1,749	10,494	None
California	+	- ⁵	-	+	-	+	+	-	+	8,000	128	9,532	*	*
Cincinnati (College)	-	-	-	-	-	+	-	... ⁴	-	1,600	21	8,500	*	None
Columbia	+	-	-	+	-	+	+	+	-	10,560	164	21,567	65,415	None
Creighton	+	-	-	-	-	-	-	-	+	8,540	95	4,800	24,000	None
Denver	+	-	-	-	-	-	-	... ⁶	+	5,630	71	6,805	20,415	295
Georgetown	-	-	-	-	-	+	-	+	+	5,000	25	5,834	17,502	*
Harvard	-	-	+	-	-	-	-	+	+	6,833	115	16,350	32,174	None
Howard	-	-	-	-	-	-	-	+	+	8,090	70	1,576	*	*
Illinois	+	+	+	-	-	+	+	+	-	5,000	84	3,331	8,564	None
Indiana	-	-	-	-	-	+	-	... ⁷	+	5,227	78	10,863	24,842	None
Iowa	+	-	+	-	-	-	+	+	+	14,393	127	5,500	24,186	1,931
Kansas City	-	-	-	-	-	-	-	... ⁴	+	11,800	115	23,316	92,364	*
Louisville	+	-	-	-	-	+	-	-	-	5,448	70	4,150	12,450	2,750
Loyola (Chicago)	+	-	+	-	-	+	-	-	+	15,230	199	26,900	*	None
Loyola (New Orleans)	+	-	-	-	-	+	-	... ⁶	+	3,938	34	1,323	10,590	1,287
Marquette	+	+	+	+	-	+	+	-	+	14,730	167	17,822	85,006	None
Maryland	-	-	-	-	-	+	-	-	+	9,324 ⁸	131 ⁸	18,100 ⁸	*	None
Meharry	-	-	-	-	-	-	-	+	+	5,829	63	4,299	*	180
Michigan	+	+	-	+	-	-	-	+	+	16,656	190	5,466	*	None
Minnesota	+	+	+	+	-	+	+	+	-	8,000	131	6,117	61,170	None
Nebraska	+	-	-	-	... ⁹	+	-	... ⁶	+	3,374	44	3,682	23,932	None
New York	-	-	+	-	-	+	-	... ⁷	-	12,608	138	36,992	*	None
North Pacific	-	-	-	-	... ¹⁰	+	-	... ¹¹	+	11,060	165	12,413	38,728	96
Northwestern	+	+	+	+	+	+	+	+	+	18,000 ⁸	130 ⁸	9,885 ⁸	*	None
Ohio College (Cincinnati)	-	-	-	-	-	+	-	+	+	3,480	67	7,140	35,700	1,600
Ohio State (Columbus)	+	-	-	-	-	+	-	+	+	6,452	66	3,493	12,114	511
Pennsylvania	+	-	+	+	-	+	-	+	+	15,556	201	16,099	*	*
Pittsburgh	+	-	+	-	- ¹²	-	-	-	+	22,500	225	20,899	61,065	7,802
St. Louis	-	-	-	-	-	+	-	+	+	10,000	105	14,578	145,780	1,222
San Francisco ("P and S")	- ¹³	-	-	-	-	+	-	... ⁴	-	7,683	106	7,211	63,998	None
Southern California	+	-	-	-	-	+	-	... ⁶	+	17,690	150	13,400	73,700	1,200
Temple	-	-	-	+	-	-	-	-	+	18,000	84	4,641	10,641	None
Tennessee	+	-	-	- ¹⁴	-	-	-	+	+	6,400	71	5,983	23,932	221
Texas	-	-	-	-	-	-	-	... ⁴	-	2,084 ¹⁵	18 ¹⁵	1,314	*	None
Tufts	-	-	+	+	-	+	-	+	+	11,416	107	6,185	18,000	6,000
Tulane	-	-	-	-	-	+	-	+	+	3,851	35	12,743	18,229	None
Vanderbilt	-	-	-	-	-	-	-	... ¹⁰	+	7,034	86	3,344	20,064	None
Virginia	+	-	-	-	-	-	+	+	+	2,432	42	1,370	5,480	32
Washington	-	-	+	-	-	+	-	... ¹⁶	+	4,000	38	3,251	*	None
Western Reserve	-	-	-	-	-	-	-	+	+	7,098	93	5,910	35,460	None
Total	21+	5+	12+	9+	3+	29+	8+ ¹⁷	22+	34+	375,980	4,258	411,452	...	25,829
Average	...	...	...	...	...	...	...	...	...	8,744	99	9,569	...	...

Schools in Canada

Alberta	+	-	-	-	-	-	-	+	... ¹⁸	...^{18}	...^{18}	...^{18}	...^{18}	...^{18}
Dalhousie	-	-	-	-	-	-	-	+	+	5,777	33	560	*	362
McGill	-	-	-	-	-	-	-	+	+	5,308	51	6,679	20,037	172
Montreal	-	-	-	-	-	-	-	-	-	2,650	50	8,649	17,299	None
Toronto	-	-	+	- ¹⁰	... ¹⁰	+	+	- ⁷	+	7,200	129	4,768	*	*
Total	1+	5-	1+	5-	1+	1+	1+	3+	3+	20,935	263	20,656	...	534
Average	...	...	...	...	...	...	...	...	...	5,234	66	5,164	...	...

TABLE 6 : NOTES

There are 43 dental schools in the United States and 5 in Canada (1924-25)

* The asterisk signifies that the school has no available data.

¹ Situated in the dental building, or in a building used jointly with the Medical School, unless otherwise indicated. Few have librarians or attendants.

² The size is that of the reading room, including any accessory rooms. In most instances there is only one room and the library is inactive.

³ The number of unbound volumes and pamphlets is indicated under "Library" in the statistical statement in Part VI for each school.

⁴ Taken from the official records. There are no available data for the Canadian schools.

⁵ The cumulative record, as given here, relates to a shorter period than sixteen years not only for schools that have been organized since 1910, but also for schools which, since 1915, have been reorganized or have entered important new relationships. See the second column in Table 1.

⁶ The library is primarily that of the Medical School.

⁷ At Minnesota the adjacent University Library contains a dental section of 2500 volumes.

⁸ At Nebraska the Biological Library (five blocks) contains about 1000 volumes related to dental subjects.

⁹ The official record for Virginia is 11.1 per cent. The School reports that all of its graduates in 1925 passed the license examinations in Virginia, but one failed to pass a later examination in West Virginia. The rules on which the record is based provide that only the results of initial examinations shall be reckoned. It is assumed that the School's information is correct. See the comment on page 532 regarding the growing tendency of dental graduates to take their first license examinations in the states where they receive the professional degree.

¹⁰ At many of the schools, the record of the number of graduates who returned to foreign countries is incomplete.

¹¹ The average percentages of failures in license examinations are taken directly from the official record, and relate to all of the schools in existence during the years indicated.

¹² Alberta will not offer a complete dental curriculum before 1926-27. The first class is expected to graduate in 1927.

TABLE 6: LIBRARY; ATTENDANCE AND SCHOLARSHIP; GRADUATES

School	Library ¹		Attendance and scholarship										Graduates				Percentage who failed in license examinations ⁴	
			Attendance						After examination	Advanced standing		Scholarship		Number				
	Size ² sq. ft.	Bound volumes ³ no.	Maximum	Women	Other countries	Negroes	End of year	Total		Other countries	Repeaters	Dropped for deficient scholarship	Total	Women	Other countries	Negroes	1925	1910-25 ⁵
									1925										1910-25^{5}
Schools in the United States																		
Atlanta	300	404	347	0	0	0	340	0	3	0	1	0	85	0	*	0	4.7	3.8
Baylor	3,200	4,100 ⁶	194	4	0	0	174	3	0	0	22	5	40	0	0	0	10.0	5.7
Buffalo	463	2,550	130	2	4	1	128	0	8	4	6	2	24	0	0	0	4.2	21.2
California	1,181	4,000	414	17	13	3	385	1	2	1	72	11	80	2	0	0	11.8	5.4
Cincinnati (College)	600	600	34	0	*	*	26	*	*	*	*	*	12	0	*	*	16.7	27.3
Columbia	2,040	1,930	379	27	24	8	371	0	8	8	21	3	88	13	11	2	17.9	29.0
Creighton	888	1,589	211	0	2	2	204	0	0	0	0	6	47	0	0	0	4.3	5.4
Denver	1,050	420	190	3	3	1	176	0	20	2	11	10	51	3	0	0	27.9	16.4
Georgetown	522	1,200 ⁶	165	0	3	0	147	0	0	0	16	1	13	0	1	0	9.1	20.1
Harvard	560	4,000	211	0	23	3	198	0	8	7	17	20	35	0	5	2	20.8	12.0
Howard	200	2,000 ⁶	104	2	8	104	90	0	1	0	17	1	20	0	1	20	57.1	29.9
Illinois	2,688	30,009 ⁶	127	9	21	9	114	0	1	6	6	10	10	19	1	0	None	9.4
Indiana	608	638	378	2	3	5	368	0	4	0	9	3	64	1	1	1	6.4	8.4
Iowa	1,224	1,700	222	1	8	2	211	0	2	0	19	3	28	0	0	1	8.0	4.7
Kansas City	678	700	435	0	2	0	415	2	20	2	52	7	91	0	*	0	2.2	2.7
Louisville	1,125	771	132	1	1	0	124	0	4	0	13	5	40	0	0	0	10.0	9.5
Loyola (Chicago)	2,020	3,700	658	0	14	0	624	0	8	2	24	13	124	0	*	0	1.7	1.9
Loyola (New Orleans)	1,008	1,625	62	2	3	0	61	0	8	0	5	1	17	1	1	0	None	1.3
Marquette	400	1,550	580	7	4	4	553	0	10	0	14	10	141	3	0	0	7.2	7.2
Maryland	3,867	19,000 ⁶	490	4	10	0	480	0	1	0	29	20	116	1	1	0	19.6	21.1
Meharry	440	758 ⁶	205	1	9	205	183	0	8	0	11	9	53	0	0	53	15.4	26.2
Michigan	1,405	3,644	346	2	29	3	326	0	1	1	34	8	54	0	*	2	None	2.8
Minnesota	None ⁷	None ⁷	390	2	6	4	359	0	3	0	105	2	89	1	6	1	18.2	6.9
Nebraska	None ⁸	None ⁸	85	1	1	0	80	0	1	0	7	2	10	0	0	0	None	7.1
New York	1,341	1,700	571	2	0	1	558	0	1	1	17	14	90	0	0	0	12.9	28.0
North Pacific	1,444	1,450	482	1	61	0	468	0	9	2	38	7	148	0	*	0	37.1	22.1
Northwestern	5,400	10,000	258	13	12	13	215	0	12	7	36	11	48	1	3	5	3.4	11.9
Ohio College (Cincinnati)	480	3,500	164	3	5	0	158	0	4	1	4	3	50	2	1	..	23.9	22.4
Ohio State (Columbus)	1,215	3,777 ⁶	142	1	1	4	141	0	2	1	26	2	22	0	0	2	None	7.6
Pennsylvania	1,953	6,300	440	16	34	13	428	0	15	10	20	8	69	6	7	3	13.0	19.3
Pittsburgh	450	5,663	1,095	14	5	19	1,038	24	12	0	53	23	176	2	1	0	0.6	2.2
St. Louis	3,500	12,000 ⁶	360	0	3	0	341	0	0	0	50	4	74	0	0	0	4.3	6.1
San Francisco ("P and S")	720	5,000	359	1	0	0	348	0	3	0	35	4	85	1	0	0	23.5	18.0
Southern California	2,138	2,997	640	14	36	8	600	0	8	0	21	24	133	2	5	1	20.2	9.0
Temple	800	3,870 ⁶	572	3	5	24	568	17	0	0	12	4	109	0	2	4	7.4	17.0
Tennessee	3,600	5,600 ⁶	87	2	0	0	85	0	0	0	3	0	27	1	0	0	7.4	7.4
Texas	None	None	93	4	8	0	93	0	13	7	5	0	23	2	7	0	13.3	17.3
Tufts	1,148	1,369 ⁶	214	9	6	5	204	0	2	2	9	3	36	0	0	1	19.4	10.3
Tulane	3,000	12,500 ⁶	110	3	2	0	105	0	1	0	10	3	37	1	0	0	2.8	6.7
Vanderbilt	2,026	11,151 ⁶	141	2	1	0	141	0	0	0	0	0	63	0	0	0	4.9	5.0
Virginia	1,980	7,463 ⁶	57	0	0	0	55	0	0	0	8	1	10	0	0	0	None ⁹	7.7
Washington	432	2,900	39	5	0	0	38	0	2	0	0	0	7	1	0	0	None	3.6
Western Reserve	352	1,668	144	1	1	2	142	0	0	0	3	4	55	0	0	2	None	13.5
Total	58,455	185,796	12,467	181	371	443	11,863	47	205	64	861	267	2,594	63	54 ¹⁰	100	...	...
Average	...	...	290	4	9	10	276	1	5	2	20	6	60	1	1	2	11.3 ¹¹	14.2 ¹¹
Schools in Canada																		
Alberta ¹²	1,173	1,600 ⁶	34	0	0	0	34	All	0	0	0	2	...	..	..	..	...	...
Dalhousie	600	7,000 ⁶	34	0	1	0	33	0	0	0	1	3	14	0	3	0	...	...
McGill	2,304	37,000 ⁶	113	1	6	0	110	0	3	0	12	0	38	0	9	0	...	...
Montreal	600	600	177	0	5	0	165	All	0	3	22	4	47	0	6	0	...	...
Toronto	722	1,129	376	7	6	0	371	0	13	3	0	0	106	0	*	0	...	...
Total	5,399	47,329	734	8	18	0	713	0	16	6	35	9	205	0	18	0	...	...
Average	...	...	147	2	4	..	143	..	3	1	7	2	42	..	4	..	...	...

TABLE 7: NOTES

There were 43 dental schools in the United States in 1924-25, and 44 in 1925-26; now there are 42 (December, 1926). In Canada the number for each year is 5

¹The numeral indicates the initial page, in Part VI, of the statistical statement relating to the school. See Table 1, and also notes 7, 8, and 11, of this table, for indications of the minimum entrance requirements.

²These "costs" have been calculated by the method stated on page 248. While accurate in their indication of average tuition fees, they cannot be contrasted without due regard for the reservations noted on page 248, and are significant in a very general way only. Thus, the expenditure per student at Western Reserve is largely an expression of the School's very liberal estimate of \$60,000 as the value of current indirect benefits accruing to the students from the School's membership in the University. See page 500 for an earlier allusion to this estimate. For information regarding the variables involved in all of these calculations, see the corresponding data in Tables 1-6 of this Appendix, and in the financial statements in Part VI (1920-24).

³The data for December, 1925-26, are used in order to make the contrast with the latest available data for 1926-27 direct and useful.

⁴As a rule the schools expend more per student than they receive in tuition fees from the student. The exceptions (Temple and Texas) are indicated by italic.

⁵The "pre-dental" students are those taking one year or more of work in the academic college preparatory to admission to the dental school. A blank in this column signifies that there are no available data regarding the number of pre-dental students.

⁶The first year of the conventional four-year dental curriculum. For Marquette and Pittsburgh, on the two-three-graduate plan, the column shows the number of pre-dental students in the second year in the academic college.

⁷The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

⁸At California and Texas, graduation from a high school continues to be the minimum entrance requirement (1926-27).

⁹The data for Indiana pertain to 1925-26. See note 7, Table 2.

¹⁰The data for Loyola (Chicago) apply to the calendar year 1924. See note 9, Table 2.

¹¹This is the number of pre-dental students in the first academic year of the School's two-three-graduate program. See the classification of the attendance at Marquette, on page 644; at Pittsburgh, on page 647.

¹²Ohio College and Vanderbilt were discontinued at the end of 1925-26. See pages 646 and 651.

¹³Rochester announced its readiness to accept dental students beginning in 1925-26. The minimum admission requirement is three years of approved work in an accredited academic college. The dental faculty of this School of Medicine and Dentistry has not yet been organized (page 467).

¹⁴There were no admissions to a first-year class on the "1-4" plan; the present first-year students constitute the first class on the new "0-5" plan.

¹⁵Tulane will discontinue the School after the graduation of the present third-year and fourth-year students. Meanwhile, no new students will be admitted.

TABLE 7: COSTS PER STUDENT; CLASSIFICATION OF ATTENDANCE

School	Page ¹	Costs per student ²			Classification of the attendance (D.D.S.) during the first semester (December) of each of the last two academic years: 1925-27 ³											
		Average amounts paid in 1924-25 per student (D.D.S.) by the			1925-26						1926-27					
		School ⁴	Student	Difference ⁴	"Pre-dental" year ⁵	1st year ⁶	2d year	3d year	4th year	Total	"Pre-dental" year ⁵	1st year ⁶	2d year	3d year	4th year	Total

Schools in the United States

Atlanta	310	\$293	\$230	\$63	...	105	90	79	90	364	...	19 ⁷	100	97	86	302
Baylor	555	495	228	267	...	61	47	40	30	178	...	18 ⁷	52	37	39	146
Buffalo	444	882	324	558	...	27	7	49	51	134	36	33	18	9	50	146
California ⁸	265	507	229	278	...	78	84	97	100	359	...	78	73	82	129	362
Cincinnati (College)	491	601	226	375	...	6	10	6	8	30	...	None	13	15	35	63
Columbia	453	644	341	303	...	25	31	109	138	303	...	34	25	31	107	197
Creighton	436	377	194	183	...	80	54	38	51	223	...	6 ⁷	73	52	38	169
Denver	281	432	208	224	...	58	39	38	45	180	...	6 ⁷	49	41	39	135
Georgetown	288	382	213	169	...	18	62	25	23	128	28	27	19	58	26	158
Harvard	378	541	231	310	...	45	61	31	41	178	...	23	42	47	29	141
Howard	293	384	183	201	...	25	15	27	31	98	...	16	23	16	28	83
Illinois	332	1,302	160	1,142	...	45	51	23	29	148	...	47	37	49	24	157
Indiana	340	259 ⁹	230 ⁹	29 ⁹	...	106	90	97	75	368	35	14 ⁷	104	85	105	343
Iowa	345	842	179	663	...	66	65	52	64	247	...	60	61	59	48	228
Kansas City	411	320	243	77	...	98	91	109	100	398	33	26 ⁷	85	81	114	339
Louisville	353	682	282	400	...	17	8	46	33	104	...	9	17	11	59	96
Loyola (Chicago)	317	408 ¹⁰	252 ¹⁰	156 ¹⁰	...	235	181	169	126	711	52	46 ⁷	199	173	160	630
Loyola (New Orleans)	363	517	234	283	...	32	18	17	19	86	18	14 ⁷	29	20	28	109
Marquette	573	330	246	84	75 ¹¹	7	144	121	121	468	70 ¹¹	38	27	143	123	401
Maryland	369	281	271	10	25	111	107	106	133	482	53	38 ⁷	97	99	104	391
Meharry	549	285	180	105	...	26	32	56	43	157	...	33	30	24	59	146
Michigan	395	846	215	631	...	135	112	70	76	393	200	88	107	101	76	572
Minnesota	402	688	216	472	...	99	75	79	119	372	...	102	75	75	102	354
Nebraska	431	723	137	586	...	25	25	25	15	90	38	29	18	20	27	132
New York	449	441	291	150	...	147	167	157	107	578	...	46	126	145	163	480
North Pacific	508	373	256	117	...	94	89	85	126	394	44	10 ⁷	97	99	93	343
Northwestern	324	1,157	298	859	...	58	51	60	69	238	50	92	75	64	60	341
Ohio College ¹² (Cincinnati)	486	390	241	149	...	11	10	52	42	115	...	...	...	...	...	...
Ohio State (Columbus)	500	548	158	390	...	77	55	42	18	192	...	61	71	58	41	231
Pennsylvania	514	566	283	283	...	177	128	110	103	518	...	172	156	126	120	574
Pittsburgh	526	344	238	106	153 ¹¹	56	352	238	242	1,041	153 ¹¹	116	96	280	266	911
Rochester ¹³	463	...	...	...	None	...	...	...	None	...	None	None	None	...	...	None
St. Louis	423	475	253	222	...	156	97	76	73	402	51	18 ⁷	128	74	68	339
San Francisco ("P and S")	273	277	214	63	...	52	77	82	79	290	58 ¹⁴	None ⁷	51	81	73	263
Southern California	258	376	266	110	...	145	149	129	160	583	119	30 ⁷	130	152	147	578
Temple	521	194	209	15	...	53	156	153	100	462	...	80	67	146	154	447
Tennessee	539	869	151	718	...	17	1	28	29	75	...	34	21	14	20	89
Texas ⁵	560	128	176	48	...	36	35	20	38	129	...	51	44	38	22	155
Tufts	384	535	235	300	...	118	77	53	40	288	...	127	104	71	53	355
Tulane	359	570	198	372	...	None	23	25	14	62	...	...	None	20	22	42
Vanderbilt ¹²	543	407	232	175	...	18	18	6	55	97	...	...	...	...	...	...
Virginia	566	1,239	264	975	...	36	7	12	18	73	...	40	28	11	11	90
Washington	417	996	207	789	...	61	29	9	21	120	27	8 ⁷	69	37	16	157
Western Reserve	495	1,158	259	899	...	71	50	24	13	158	...	75	58	46	24	203
Total	...	...	...	...	253	2,913	3,070	2,870	2,908	12,014	1,065	1,764	2,694	2,887	2,988	11,398
Average	...	\$469	\$241	\$228	...	66	71	67	68	273	...	43	64	70	73	271

Schools in Canada

Alberta	583	\$765	\$92	\$673	10	9	10	7	...	36	9	11	10	8	7	45
Dalhousie	590	705	197	508	...	13	8	6	6	33	12	9	9	5	6	41
McGill	610	772	164	608	...	10	13	28	28	79	...	3	10	12	30	55
Montreal	605	448	226	222	...	21	22	37	55	135	13	6	18	23	45	105
Toronto	596	364	204	160	53	70	60	60	92	335	61	61	62	59	62	305
Total	...	...	...	...	63	123	113	138	181	618	95	90	109	107	150	551
Average	...	\$481	\$197	\$284	...	25	23	28	36	124	...	18	22	21	30	110

SUMMARY OF DATA IN PART VI AND IN TABLES 1-7 FOR 1920-25, WITH EXTENSIONS

TABLE 8. DENTAL SCHOOLS IN THE UNITED STATES.¹ SEE TABLE 9

	1920-21	1921-22	1922-23	1923-24	1924-25 ²	1920-25		
						Total	Average per year	
							All schools	Per school
Number of schools	46	46	46	43	43	224	44.8	...
Current income	\$4,285,528	\$4,971,140	\$5,618,420	\$5,781,931	\$5,828,543	\$26,485,562	\$5,297,112	\$118,239
Current expenditures	4,144,418	4,761,729	5,330,951	5,460,410	5,558,472	25,255,980	5,051,196	112,750
Surplus	\$141,110	\$209,411	\$287,469	\$321,521	\$270,071	\$1,229,582	\$245,916	\$5,489
Deficit	...	...	...	...	...	...	...	...
Paid by universities in excess of dental income, and included above	\$787,925	\$930,887	\$908,636	\$953,237	\$1,185,027	\$4,765,712	\$953,142	...
Direct appropriation	195,512	254,976	294,266	350,078	512,016	1,606,848	321,370	...
Indirect—estimated (net) ³	592,413	675,911	614,370	603,159	673,011	3,158,864	631,773	...
Net deficit ³	646,815	721,476	621,167	631,716	914,956	3,536,130	707,226	...
Income from endowment	41,520	49,678	50,271	55,347	52,401	249,217	49,843	1,113
Library expenses	13,082	15,843	19,891	22,912	25,343	97,071	19,414	433
Research expenses	14,347	16,432	22,164	36,795	41,370	131,108	26,222	585
Payments on account of debt	201,895	194,410	207,421	232,522	183,815	1,020,063	204,013	4,554
Principal	128,721	102,215	114,015	150,104	93,766	588,821	117,764	2,629
Interest	73,174	92,195	93,406	82,418	90,049	431,242	86,248	1,925
Salaries	2,246,812	2,497,231	2,756,546	3,026,809	3,139,970	13,667,368	2,733,474	61,015
Administration	331,312	357,859	394,050	407,056	405,910	1,896,187	379,237	8,465
Instruction	1,915,500	2,139,372	2,362,496	2,619,753	2,734,060	11,771,181	2,354,236	52,550
Subjects: ⁴								
Academic or medico-dental	800,415	833,767	868,207	929,240	980,462	4,412,091	882,418	19,697
Dental	1,115,085	1,305,605	1,494,289	1,690,513	1,753,598	7,359,090	1,471,818	32,853
Per teacher: dental subjects	891	931	986	1,061	1,145	...	1,009	1,009
Fees (income)	3,305,176	3,774,619	4,431,898	4,560,316	4,396,996	20,469,005	4,093,801	91,382
Students	2,392,437	2,664,796	2,928,685	2,937,660	2,858,602	13,782,180	2,756,436	61,528
Patients	912,739	1,109,823	1,503,213	1,622,656	1,538,394	6,686,825	1,337,365	29,852
Average payments ("costs"):								
By school for student ⁵	353	385	407	442	469	...	411	411
By student to school ⁵	204	215	224	238	241	...	224	224
Difference	149	170	183	204	228	...	187	187
By patient to school	3.48	3.62	3.93	3.82	3.74	...	3.74	3.74
Teachers of dental subjects ⁴	1,252	1,403	1,515	1,593	1,531	7,294	1,459	33
Persons treated in the infirmaries	262,595	306,467	381,928	424,780	411,452	1,787,222	357,444	7,979
Attendance: D.D.S. (end of year)	11,745	12,369	13,099	12,355	11,863	61,431	12,286	274
Women	198	182	170	174	181	905	181	4
Students from foreign countries ⁶	407	434	476	452	371	2,140	428	9
Negroes	769	754	712	542	443	3,220	644	14
Advanced standing	266	281	264	215	205	1,231	246	5
Special curricula (attendance):								
Dental hygienists	*	217	298	267	258	1,040	260	...
Graduate students	2	2	8	18	26	56	11	...
Practitioners (advanced)	*	360	327	210	308	1,205	301	7
Graduates (D.D.S.)	1,821	1,791	3,416	3,380	2,594	13,002	2,600	58
Women	47	46	60	51	63	267	53	1
Students from foreign countries	50	52	68	47	54	271	54	1
Negroes	88	105	291	180	100	764	153	3
State board record: ⁷								
Number of states*	42	43	47	47	47	...	45-46	...
Number of graduates examined	1,650	1,577	3,013	3,092	2,407	11,739	2,348	52
Number of failures	219	200	306	377	272	1,374	275	6
Percentage of failures	13.3	12.6	10.1	12.2	11.3	11.7	11.7	11.7

* Record incomplete.

¹ Some of the annual totals are tabulated on pages 150 and 151. See also Tables 1-7; and Table 9, footnote 1.

² See Errata (page 663) for references to deviations here from Table 4 on page 151.

³ The totals for the supplementary payments by universities include liberal estimates of the value of the indirect benefits derived by most of the schools from their membership in universities.

⁴ The distinction between "dental subjects" and "academic or medico-dental subjects" is indicated on page 249.

⁵ Calculated for the attendance at the end of the year.

⁶ The records at some of the schools, on the number of graduates who returned to foreign countries, are incomplete. The number is somewhat larger than these figures indicate.

⁷ Taken from the official records, in which the returns were not quite complete in any year.

SUMMARY OF DATA IN PART VI AND IN TABLES 1-7 FOR 1920-25, WITH EXTENSIONS

TABLE 9. DENTAL SCHOOLS IN CANADA.¹ SEE TABLE 8

	1920-21	1921-22	1922-23	1923-24	1924-25 ²	1920-25		
						Total	Average per year	
							All schools	Per school
Number of schools	5	5	5	5	5	25	5	...
Current income	\$374,539	\$397,552	\$396,279	\$342,465	\$324,090	\$1,834,925	\$366,985	\$73,397
Current expenditures	344,462	385,156	387,992	348,937	343,297	1,809,844	361,969	72,394
Surplus	\$30,077	\$12,396	\$8,287	...	...	\$25,081	\$5,016	\$1,003
Deficit	...	...	...	\$6,472	\$19,207 ³	...	...	...
Paid by universities in excess of dental income, and included above	\$45,809	\$64,355	\$58,440	\$86,081	\$98,311	\$352,996	\$70,599	...
Direct appropriation	17,654	26,246	24,881	37,280	46,918	152,979	30,596	...
Indirect—estimated (net) ⁴	28,155	38,109	33,559	48,801	51,393	200,017	40,003	...
Net deficit ⁴	15,732	51,959	50,153	92,553	117,518	327,915	65,583	...
Income from endowment	None	None	None	None	None	None	...	...
Library expenses	607	1,139	496	633	432	3,307	661	182
Research expenses	1,840	1,840	1,840	1,840	None	7,360	1,472	294
Payments on account of debt	5,271	20,339	19,830	11,191	11,918	68,549	13,710	2,742
Principal	2,244	15,571	14,754	6,588	6,714	45,871	9,174	1,835
Interest	3,027	4,768	5,076	4,603	5,204	22,678	4,536	907
Salaries	203,423	225,776	235,358	210,719	216,034	1,091,310	218,262	43,652
Administration	35,240	36,623	40,276	32,939	30,504	175,582	35,116	7,023
Instruction	168,183	189,153	195,082	177,780	185,530	915,728	183,146	36,629
Subjects: ⁵								
Academic or medico-dental	54,586	59,610	64,244	59,339	59,805	297,684	59,517	11,903
Dental	113,597	129,543	130,838	118,441	125,725	618,144	123,629	24,726
Per teacher: dental subjects	1,014	1,089	1,148	1,077	1,221	...	1,108	1,108
Fees (income)	284,304	289,389	282,530	235,403	196,078	1,278,704	255,741	51,148
Students	245,922	218,184	203,648	173,154	140,773	981,681	196,336	39,267
Patients	38,382	62,205	78,882	62,249	55,305	297,023	59,405	14,851 ⁶
Average payments ("costs"):								
By school for student ⁷	276	311	337	398	481	...	346	346
By student to school ⁷	197	176	177	197	197	...	188	188
Difference	79	135	160	201	284	...	158	158
By patient to school	2.51	3.48	3.84	2.85	2.68	...	3.09	3.09
Teachers of dental subjects ⁵	112	119	114	110	103	558	112	22
Persons treated in the infirmaries	15,315	17,880	20,523	21,868	20,656	96,242	19,248	4,812 ⁶
Attendance: D.D.S. (end of year)	1,249	1,239	1,153	877	713	5,231	1,046	209
Women	22	20	16	9	8	75	15	3
Students from foreign countries ⁸	26	29	33	14	18	120	24	5
Negroes	4	4	4	2	None	14	3	...
Advanced standing	18	23	48	39	16	144	29	6
Special curricula (attendance):								
Dental hygienists (nurses)	None	22	12	12	10	56	11	...
Graduate students	None	None	None	None	None	None	...	...
Practitioners (advanced)	*	48	35	102	106	291*	58*	12*
Graduates (D.D.S.)	191	223	398 ⁹	258	205	1,275	255	51
Women	3	6	7	3	None	19	4	1
Students from foreign countries	*	*	1*	*	18	19*	4*	1*
Negroes	1	1	2	1	None	5	1	...
Provincial board record ¹⁰	No available data ¹⁰							

* Record incomplete.

¹ Tables 8 and 9 were compiled after most of this volume had been printed. A re-examination of all the data, to insure accuracy in the tabulations, resulted in the discovery of several minor discrepancies in original reports from schools. Although nearly all of the disagreements could be corrected in Part VI and in these tables, they account in part for the mathematical errors on pages 151 and 220 that are noted on page 663. See Table 8, footnote 1.

² See Tables 1-7. ³ Funds equal to the amount of the deficit were borrowed to provide income equal to the expenditures.

⁴ The totals for the supplementary payments by universities include liberal estimates of the value of the indirect benefits derived by most of the schools from their membership in universities.

⁵ The distinction between "dental subjects" and "academic or medico-dental subjects" is indicated on page 249.

⁶ Calculated for the four schools having infirmaries (none at Alberta until 1925-26).

⁷ Calculated for the attendance at the end of the year.

⁸ The records at most of the schools, on the number of graduates who returned to foreign countries, are incomplete.

⁹ At Toronto the exceptional number of graduates in 1923 was due to temporary post-war conditions (page 600, footnote 1).

¹⁰ There are no records of the results of license examinations comparable to the official tabulations for the schools in the United States.

SECTION B

STATEMENTS OF SIGNIFICANT DEVELOPMENTS AT THE DENTAL
SCHOOLS IN THE UNITED STATES AND CANADA

DURING 1926, IN EXTENSION OF THE DATA FOR 1920-25 IN PART VI

DENTAL SCHOOLS IN THE UNITED STATES¹

THE text of Part VI is based on conditions in the dental schools in the United States and Canada at the end of the academic year 1924-25, but the "summaries" and "general comment" frequently extend its scope to the end of the first half of 1925-26. Supplementary references to important new conditions during the second half of 1925-26, and before December 10, 1926, are indicated in the following brief statements, which, like the data in Section A, are grouped in the alphabetic order of the abbreviated names of the schools.

ATLANTA-SOUTHERN: PAGE 310²

On March 1, 1926, the School was re-chartered and reorganized as a non-proprietary institution by a corporation of twenty-four "founders." Title to all of the properties is now vested in a Board of Trustees having seven members. Under the terms of the charter, the "corporation shall have no capital stock and shall not be conducted for pecuniary gain or profit to any one, but its sole purpose shall be to give, promote, and extend instruction and education in dentistry, and to encourage and promote research and study in all branches of learning, arts, and sciences relating to dentistry. . . . All receipts from tuition or otherwise shall be applied exclusively to the maintenance of the institution, and no profit shall be derived from the operation, business, or property of the college by the corporation, or any of its officers or trustees. . . . If for any reason . . . this corporation shall cease to . . . function as a dental college . . . the Board of Trustees . . . shall, after the payment of all legal obligations . . . devote any fund or funds, or property . . . to any institution or organization which, in their opinion, is contributing to the education of dental students, or the advancement of learning in the dental profession." The entire capital stock has been retired. Twenty-year 3 per cent third-mortgage bonds, issued in the total amount of \$150,000, are preceded by a first-mortgage ten-year loan of \$110,000 at 8 per cent, and by a second-mortgage five-year loan of \$20,000 at 8 per cent—a total debt of \$280,000. The holders of the third-mortgage bonds have agreed to waive interest for six consecutive years before foreclosure, which can be ordered only by a two-thirds vote of the value of the outstanding bonds.

On April 15, 1926, the School was moved to Courtland Street and Forrest Avenue, three-fourths of a mile from the centre of the city, where it occupies new quarters consisting of a four-story concrete and brick building, intended to accommodate about 500 students, and a two-story brick annex for the exclusive use of the Department of Anatomy. The total floor area of the main building is 40,400 sq. ft.; of the annex, 3000 sq. ft. The Infirmary has a total floor area of 8884 sq. ft.; and contains 139 chairs. The total completed cost of land and buildings was \$214,637; of the equipment (including the value of old equipment), \$111,752—a total investment of \$326,389.

The Dental Educational Council of America rated the School Class A, as of August 1, 1926. The minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the

¹ The section on dental schools in Canada opens on page 633.

² In the central headings, the page numerals after the names of the schools refer the reader to the corresponding statistical statements in Part VI.

number of first-year students: 1925-26—105; 1926-27—19. See Table 7. The School does not conduct a five-year curriculum to include the intended equivalent of one year of approved work in an accredited academic college, but two years of such work admits the student to a three-year curriculum. Bedside and surgery clinics at St. Joseph's Infirmary (one block), begun in 1925-26, are used in the fourth year to supplement the lecture course (32 hours) in physical diagnosis.

BAYLOR: PAGE 555

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—61; 1926-27—18. See Table 7.

BUFFALO: PAGE 444

The School's experimental study of the dental curriculum, in an effort to improve the instruction in the correlations between medicine and dentistry, has shown with increasing clarity that the medico-dental sciences can be taught most advantageously to dental students in separate classes, and in courses adapted to the requirements of preventive and remedial dental practice. It is believed, also, that further improvement might be effected by extending the academic year to include a summer "quarter," and by shortening the undergraduate curriculum from four conventional years to three lengthened years—a prospective change that is now under advisement for early adoption.

At the Buffalo City Hospital the seniors in dentistry receive weekly, throughout the year, three hours of clinical instruction in the subjects mentioned on page 444. They attend demonstrations but do not conduct treatments or perform operations. A committee of the Faculty has been appointed to consider the desirability of organizing a curriculum for dental hygienists, beginning in 1927-28.

CALIFORNIA: PAGE 265

This School is now the only dental school in a university, in the United States or Canada, that does not require at least one year of approved work in an accredited academic college for admission to a four-year professional curriculum, or does not include it as the first year in a five-year combination of academic and professional curricula. Since the beginning of 1926-27, the School has failed, in this respect, to meet a prerequisite for the Dental Educational Council's Class A or Class B rating, and is now "unclassified," on the Council's register, as of December 4, 1926. See page 656.

Although high-school graduates of 1926 may obtain the dental degree at the University of California in 1930, but not before 1931 at any other American school excepting the proprietary Texas Dental College, nevertheless at California the number of first-year dental students in 1926-27 is not larger than in 1925-26. See Table 7. Graduate courses in dentistry were inaugurated in 1925-26; degree: M.S.; attendance: 1925-26 (end of the year)—8; 1926-27 (beginning of the year)—6.

CINCINNATI COLLEGE: PAGE 491

The School has no first-year students.¹ The data for recent attendance continue to indicate that, despite the School's Class C rating, it is popular among students who have occasion to leave other schools. Thus, the class of 1927 has grown from none in 1923-24 to 35 in 1926-27. This situation will probably continue while the dental profession in

¹ The Ohio Dental Board has recently announced that it will not admit to the license examinations any future graduates of this School who as students are not now members of the second-year, third-year, or fourth-year class.

Ohio remains inattentive to it, and so long as state boards of dental examiners admit the graduates of Class C schools to license examinations.¹

CLASSIFICATION OF THE TOTAL ATTENDANCE AT THE CINCINNATI COLLEGE OF
DENTAL SURGERY: 1924-27

	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
1924-25	7	2	2	15	26
1925-26	6	10	6	8	30
1926-27	0	13	15	35	63

COLUMBIA: PAGE 453

The Courses in Oral Hygiene, which since 1916 have been conducted by the Department of University Extension, are now given under the auspices of the Dental Faculty. The Dental Educational Council rated the School Class B, as of August 1, 1926. The Associate Director is serving as Acting Director.

The Trustees of the University have definitely decided to include the School in the new Health Centre now being created at West 168th Street, New York City, where the School will be closely coordinated with the Medical School, and the associated hospitals and dispensaries, under conditions of exceptional advantage for the promotion of teaching and research in all aspects of oral health-service. Important reorganization is about to be effected.

CREIGHTON: PAGE 436

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—80; 1926-27—6. See Table 7.

DENVER: PAGE 281

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—58; 1926-27—6. See Table 7.

GEORGETOWN: PAGE 288

On May 18, 1926, twenty-seven members of the Faculty, objecting to pending reorganization of the School, resigned in a body as the final examinations for the year were about to be conducted. The University met this emergency without serious embarrassment to the students. The Faculty has been completely reorganized under the leadership of a whole-time Dean, who was Dean of the Washington Dental College (1897-1901) and served as Dean of the Georgetown School from 1901 to 1913. The Dean gives his attention exclusively to administrative duties. There are now whole-time professors of oral surgery, prosthetic dentistry, crown and bridge work, and operative dentistry, and a whole-time Superintendent of the Infirmary.

Since September, 1926, all of the School's funds have been received by the Treasurer of the University, the Dean of the Medical School no longer serving as Treasurer of the Dental School.

The Professor of Oral Surgery and Oral Diagnosis and the Professor of Dental Medicine give to the senior students of medicine, weekly throughout the academic year, two hours of instruction in clinical dentistry.

¹ The Ohio Dental Board has recently announced that it will not admit to the license examinations any future graduates of this School who as students are not now members of the second-year, third-year, or fourth-year class.

HARVARD: PAGE 378

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is two years of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—45; 1926-27—23. See Table 7.

The title of the Assistant Professor of Dental Research has been changed (1925-26) to "Thomas Alexander Forsyth Professor of Dental Science." A course in hygiene and public health has been established, to stress the ideal of prevention and to teach broadly the principles of preventive dentistry. The freshmen are now required to submit to a physical examination, and all remedial defects must be corrected before graduation. The library has been completely reorganized and recatalogued, many new volumes have been added, and the assistant librarian gives whole-time service.

HOWARD: PAGE 293

Senior students of medicine and of dentistry are now taught clinical dentistry and oral surgery in a weekly dental clinic at the Freedmen's Hospital, which has a graduate dental interne. The senior dental students, in groups, will receive sixteen hours of this instruction during the present academic year. In the medical building a new laboratory for dental technology (floor area, 1050 sq. ft.) has been equipped for the use of dental students.

ILLINOIS: PAGE 332

Since September 1, 1926, the Professor of Orthodontia has been the Dean of the School. The junior and senior dental students now receive instruction in general medicine and oral surgery, and the medical students are taught oral surgery, in the Research Hospital (one block), one of the University's new group of medical buildings. The instruction in general medicine extends through forty-eight hours each year. In oral surgery for both medical and dental students, the instruction is given by a member of the Dental Faculty.

INDIANA: PAGE 340

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—106; 1926-27—14. See Table 7.

No appropriation has been made by the Indiana Legislature for the maintenance of the School (December, 1926). The University, lacking funds that are urgently needed for its general support, has been financing the School on the income from fees, a profit of \$16,126 having been obtained in 1925-26. The average amount of the fees paid by the students in 1925-26 was \$230, but the expenditures in behalf of the average student exceeded this amount by only \$29. The citizens of Indiana should not expect the University to conduct a good dental school, and to promote the best quality of oral health-service, without adequate financial means for the purpose. The University has announced its intention to award the D.D.S. degree to all of the surviving graduates of the Indiana Dental College, and is presenting the diploma to those who apply for it.

IOWA: PAGE 345

A Children's Clinic of ten chairs, separate from the general Infirmary, has been established. The School, coöperating with the State Board of Control of Penal and Eleemosynary Institutions, conducts an Accessory Clinic of four chairs at the State Sanatorium for the

Treatment of Tuberculosis, at Oakdale, Iowa, five miles from the University. The Clinic is open from 10 a.m. to 4 p.m., one day a week, when dental seniors, in groups of four under the direction of a member of the Dental Faculty, do the clinical work. Each group of students, carefully instructed in the precautions to be observed in practice for patients having tuberculosis, is shown the oral evidences of tuberculosis, and also the effects of oral cleanliness and improved dental function on the rate of improvement or recovery. The service of each senior (ten hours) is an accredited part of his practical training for the year.

A required course in oral hygiene has been added to the first-year curriculum. It includes examinations of the mouth and teeth of the members of the class, followed by reparative measures and instruction in prevention, but does not supplant the courses in hygiene, dietetics, and prophylaxis in the third and fourth years.

KANSAS CITY-WESTERN: PAGE 411

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26 — 98; 1926-27 — 26. See Table 7. The School now conducts a five-year curriculum intended to include the equivalent of one year of approved work in an accredited academic college; present attendance of first-year (pre-dental) students: 33.

On October 29, 1926, the Trustees of Kansas City-Western Dental College conveyed to Lincoln and Lee University, by general warranty deed, the new main dental building and the land it occupies, subject to first and second mortgages, and also the unencumbered equipment of the College, but the older and smaller building was not included in the transaction. By the terms of this conveyance, the School (a) until 1938 will be conducted by a board of five trustees, two of whom will be directly designated by the University and three by the College, but all of whom will be subject to rejection or confirmation by the University; and (b) on July 1, 1938, it will automatically become an integral part of the University, when all of the School's property will accrue to the University. The intrinsic value of the new real estate, as estimated by the College, was \$350,000, and of the equipment, including important recent additions, \$128,600 — a total of \$478,600. The amounts of two mortgages on the property are: first mortgage, \$81,868 (the unpaid balance of \$100,000 originally) at 6 per cent; second mortgage, \$106,000 at 5.5 per cent — a total indebtedness of \$187,868. The former owners of the new real estate, who continue as trustees of the School, accepted the second mortgage in full payment of their equity in the real property. The College will be required to pay annually, from its current income, not less than \$6000 of the principal of the first mortgage and also the interest on the unpaid portion of the principal. At least \$10,000 of the principal of the second mortgage, to be paid by the University, will be due annually, from 1936 and before 1947. The interest on the second mortgage in lieu of rental, due annually on the unpaid portion of the principal beginning in November, 1926, will be paid by the School from current income, but a delinquency on any payment may continue for thirty months before the mortgage can be foreclosed. The agreement between the contracting parties provides that "if at any time the project of the establishment of the Lincoln and Lee University should fail or be abandoned," the Trustees of the University will endeavor to affiliate the School with a non-proprietary educational institution in the vicinity of Kansas City, and to prevent the use of the property for private purposes in dental education.

It is expected that public benefactions will enable Lincoln and Lee University promptly to pay for all of the School's property, and at an early date to make the School an integral part of the University. A campaign for funds to insure the establishment of the University is about to be inaugurated. On June 1, 1926, the School's remaining indebtedness of

\$22,400 on its equipment was paid in full from current income. The number of students who were admitted to advanced standing since 1922-23, and are now in the School, has been reduced to ten. *Visited* (for the third time): *April, 1926.*

LOUISVILLE: PAGE 353

The part-time Dean has been succeeded by a whole-time Acting Dean, who is also Professor of Dental Pathology and Dental Therapeutics. The floor area of the Infirmary has been increased 900 sq. ft. and a new adjunct laboratory with two accessory rooms, adequate for 75 students, has been added to it. The clinical work has been divided into departments: crown and bridge work, dental pathology, denture construction, operative dentistry, oral surgery, roentgenography, and therapeutics. The curriculum and courses of instruction have been generally reorganized. Important changes have been made in the Faculty in conformity with this improvement.

LOYOLA (CHICAGO): PAGE 317

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26 — 235; 1926-27 — 46. See Table 7. The dental students now receive all of their instruction in general anatomy at the Medical School (one and one-half blocks). The Professor of Anatomy in the Medical School occupies the same chair in the Dental Faculty. This improvement appears to be the first step toward close coordination in the work of the Medical and Dental Schools.

The University now conducts, in the dental building, a first-year curriculum for dental students ("0-5 plan") that is intended to be equivalent to one year of approved work in an accredited academic college: present attendance of first-year (pre-dental) students: 52. Full-year graduate curricula, leading to advanced degrees, are being organized for instruction in orthodontia; also in dental surgery, which will include anatomy, pathology and bacteriology, exodontia, roentgenography, and anesthesia.

Research in mandibular and maxillary nutrition, to include the relation of the soft and hard tissues of the mouth to the problem of artificial denture construction, is now in progress. On June 30, 1926, the School's endowment fund, accumulated from current income, including accrued interest, was \$72,385.

LOYOLA (NEW ORLEANS): PAGE 363

The Dental Educational Council of America rated the School Class A as of August 1, 1926. The School's minimum academic requirement for admission to a four-year undergraduate

RECENT ATTENDANCE AT THE TWO DENTAL SCHOOLS IN NEW ORLEANS

		<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
1924-25	Tulane	29	25	14	37	105
	Loyola	17	15	12	17	61
	Total	46	40	26	54	166
1925-26	Tulane	0 ¹	23	25	14	62
	Loyola	32	18	17	19	86
	Total	32	41	42	33	148
1926-27	Tulane	0 ²	0 ¹	20	22	42
	Loyola	14 ¹	29	20	28	91
	Total	14	29	40	50	133

¹ The first group affected by the latest minimum entrance requirement of one year of approved work in an accredited academic college. See footnote 2.

² The School will be discontinued in 1928; meanwhile, no new students will be admitted. See page 651.

curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—32; 1926-27—14. See Table 7. The number of prospective dental students now in the first year in the academic college is 18.

The recent attendance at the two dental schools in New Orleans is shown in the table on page 643. (See also page 368.)

MARQUETTE: PAGE 573

The former Associate Professor of Oral Hygiene and Pathology, and Superintendent of the School for Dental Nurses, at the University of Minnesota, is now the whole-time Director of the Graduate Courses in Dentistry at Marquette University. Until the work of the graduate students requires his undivided attention, he will conduct a study of the organization and content of the undergraduate courses, particularly from the point of view of their coordination with the graduate courses.

The attendance, last year and at present, is shown by the accompanying data. The steady increase in the number of students on the new plan, since the initial loss, is a striking feature of these figures.

CLASSIFICATION OF THE ATTENDANCE OF DENTAL STUDENTS AT MARQUETTE UNIVERSITY: 1925-27

Year	Curriculum	Academic years		Professional years				Total	
		First	Second	First	Second	Third	Fourth		
1925-26	The "0-4 plan"	...	...	...	144	121	121	386	
	New two-three-graduate plan	59	16	7	...	...	...	82	468
1926-27	The "0-4 plan"	...	...	...	...	135 ¹	123	258	
	New two-three-graduate plan	70	38	27	8 ¹	...	...	143	401

The Dean of the School is President of the American Dental Association (1926-27).

MARYLAND: PAGE 369

On June 15, 1923, when the Baltimore College of Dental Surgery was united with the Dental School of the University of Maryland, by an agreement that was not entirely clear in some of its phraseology, the University of Maryland began to administer the consolidated schools as the "School of Dentistry of the University of Maryland and the Baltimore College of Dental Surgery." In 1924 and 1925, the diplomas were issued in the names of both. On April 9, 1924, the Maryland Legislature, in ratifying the amalgamation, expressed ambiguously the Legislature's purpose to continue only the Baltimore College of Dental Surgery and to discontinue the School of Dentistry that had formerly been a part of the University. On December 13, 1925, the Baltimore City Dental Society voted to appeal to the Regents of the University "to rearrange the title of the School to conform with the spirit of the merger agreement" so that the name of the older school would "stand out as it was intended it should." On May 18, 1926, after the Legislature's intention had been officially clarified by the Attorney General of the State of Maryland, the University announced the continuance of the Baltimore College of Dental Surgery as the Dental School of the University, and the simultaneous discontinuance of the previous School of Dentistry of the University of Maryland, to be effective as of June 15, 1923, but without nullification of any of the equities involved in the conditions that had been maintained while the two schools were continued as one. The School now bears the official title: "Baltimore College of Dental Surgery, Dental School, University of Maryland."

¹ In several courses the second-year and third-year students, on these two plans, are being taught in the same classes.

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—111; 1926-27—38. See Table 7. The University now conducts, in the dental buildings, a first-year curriculum for dental students ("0-5 plan") that is intended to be equivalent to one year of approved work in an accredited academic college; present attendance of first-year (pre-dental) students: 53.

The Dean of the School has been assured (September, 1926) by the Governor of the State, the Chairman of the Board of Regents, and the President of the University, that the surplus accumulated from the earnings of the School, although the annual portions have reverted to the state treasury, will be reserved for the use of the Dental School. The accumulated surplus, at the end of 1925-26, was \$57,210. During 1925-26 the expenditures for reconstruction were \$9305; for new equipment, \$18,717; total, \$28,022. This amount was drawn from the accumulated surplus. Important reorganizations of the Faculty and of the instruction are in progress.

The School has vacated the building of the former Baltimore College of Dental Surgery, the recent extension of the main Infirmary having provided an equivalent of the clinical facilities in the old building. At 6 and 8 South Green Street, a four-story building with a basement (floor dimensions—42 x 80 ft.), purchased by alumni of the Schools of Dentistry and Pharmacy and rented for three years by the University, has been added to the equipment of both schools. In addition to laboratories, lecture rooms, and offices of administration, for the Schools of Dentistry and Pharmacy, it also contains a union library (room: 544 sq. ft.; whole-time librarian). The dental books in Davidge Hall and the books of the Clarence J. Grieves Foundation of the Baltimore City Dental Society constitute the dental section. An appropriation of \$1000 for the current year is being applied to the purchase of additional dental books and current journals.

MEHARRY: PAGE 549

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1927-28, will be two years of approved work in an accredited academic college. The accompanying data for recent attendance are interesting in this connection. See the footnote on page 298.

CLASSIFICATION OF THE ATTENDANCE OF DENTAL STUDENTS AT MEHARRY: 1924-27

	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
1924-25	33 ¹	50	36	64	183
1925-26	26	32 ¹	56	43	157
1926-27	33	30	24 ¹	59	146

MICHIGAN: PAGE 395

The School's minimum academic requirement for admission to a three-year undergraduate curriculum, beginning in 1927-28, will be two years of approved work in an accredited academic college. From the number of students who are now taking the second year of approved work in accredited academic colleges and have indicated their purpose to enter the three-year curriculum, the Dean estimates that the first-year class in 1927-28 will be fully equal to the maximum number the School can admit.

¹ The first group affected by the present entrance requirement of one year of approved work in an accredited academic college.

MINNESOTA: PAGE 402

The School's minimum academic requirement for admission to a three-year undergraduate curriculum, beginning in 1927-28, will be two years of approved work in an accredited academic college.

NEBRASKA: PAGE 431

The rooms in the rented building have been renovated, and their equipment and facilities greatly improved. Until the Legislature appreciates the urgent need for better clinical facilities, and provides them, the School will be unable to give the State the highest grade of service. The Faculty has been undergoing effectual reorganization, with special reference to the acquisition of experienced teachers, and to a larger measure of interest and control by the Faculty as a body.

NEW YORK: PAGE 449

The Dental Educational Council rated the School Class B, as of August 1, 1926. The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is two years of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—147; 1926-27—46. See Table 7.

A teaching Diagnostic Clinic of ten chairs has been established for the careful examination of all patients who are admitted to the Infirmary. Senior and junior students make examinations under competent instruction. A Children's Clinic of ten chairs has been installed. Children of pre-school age are receiving preventive and remedial treatment in all phases of oral health-service.

NORTH PACIFIC: PAGE 508¹

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—94; 1926-27—10. See Table 7. The School now conducts a five-year curriculum intended to include the equivalent of one year of approved work in an accredited academic college; present attendance of first-year (pre-dental) students: 44.

NORTHWESTERN: PAGE 324

During October, 1926, the School moved into the exceptional new building, which, provided and maintained from the great gifts of Mrs. Montgomery Ward, is the largest now used jointly by schools of medicine and dentistry.

OHIO COLLEGE (CINCINNATI): PAGE 486

This School, unsuccessful in its effort to obtain an endowment or gifts of special funds for its support, and unable to maintain the quality of an acceptable school on its income from fees, was discontinued on July 15, 1926.² Publication of the Dental Educational Council's rating of the School had been suspended since July 1, 1923, pending prospective organic union of the School with the University of Cincinnati.

¹ Preliminary informal action by representatives of the Oregon State Board of Dental Examiners and of the Oregon State Dental Association indicates that these organizations are about to further the development of oral health-service at the Medical School and hospitals of the University of Oregon, in Portland. See page 613.

² See page 651 for statements of similar conditions and consequences at Tulane and Vanderbilt.

OHIO STATE (COLUMBUS): PAGE 500

The Dental Educational Council rated the School Class A, as of August 1, 1926.

The appropriation of \$200,000 by the Ohio State Legislature in the spring of 1925, for the extension and equipment of the dental section of the new Hamilton Hall, has been under contract for these purposes and the new construction has almost been completed. The size of the Infirmary will be doubled, and the new units will include an infirmary for children, an amphitheatre, an exodontia clinic, a roentgenographic department, important facilities and equipment for oral surgery, sterilization rooms, three recitation rooms, a room for meetings of the Faculty, and laboratories for research, metallurgy, and plaster modeling. The appropriations for the salaries of the teachers of dental subjects were increased \$5500 in 1925-26 and \$3100 for 1926-27.

PENNSYLVANIA: PAGE 514

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1927-28, will be two years of approved work in an accredited academic college. The Instructor in Operative Dentistry, a whole-time officer, has been appointed Assistant to the Dean.

PITTSBURGH: PAGE 526

At this School a former member successively of the dental faculties of Northwestern University and the University of Illinois, long active in dental research and now Secretary of the International Association for Dental Research, is serving as Director of Research and Professor of Anatomy. He is also assisting in the development of the graduate courses and graduate curricula in dentistry in the Dental Division of the Graduate School of the University.

The School's minimum academic requirement, for admission to a three-year undergraduate curriculum, is two years of approved work in an accredited academic college. The attendance last year and at present is shown by the data in the accompanying table. After an initial decrease, the number of students on the two-three-graduate plan has steadily increased and promises to mount rapidly to the maximum the School will admit.

CLASSIFICATION OF THE ATTENDANCE OF DENTAL STUDENTS AT THE UNIVERSITY
OF PITTSBURGH: 1925-27

Year	Curriculum	Academic years		Professional years				Total	
		First	Second	First	Second	Third	Fourth		
1925-26	The "0-4" plan	...	...	...	352	238	242	832	
	The "1-4 plan" ¹	...	...	56 ²	...	...	...	56	
	New two-three-graduate plan	153	None	...	...	...	...	153	1041
1926-27	The "0-4" plan	...	...	...	...	280	266	546	
	The "1-4 plan" ¹	...	...	...	85 ²	...	...	85	
	New two-three-graduate plan	153	116	11 ³	...	...	...	280	911

¹ Only one class was admitted on the "1-4 plan."

² This group contains a number of students who, admitted on the "0-4 plan," are repeating a year with students admitted on the "1-4 plan."

³ In some subjects the first-year students in the two-three-graduate group receive instruction with the second-year students in the 1-4 group.

ROCHESTER: PAGE 463

The Council on Medical Education rated the School Class A, as of February 14, 1926. "This approval was from the standpoint of the Medical School and did not take into consideration the Dental Department." The preparations for the inauguration of a study of the etiology of dental caries, mentioned on page 465, have been completed and the research is now progressing in the Department of Bacteriology. The School was opened in September, 1925. The present attendance of students and their geographical distribution (November, 1926) are indicated in the accompanying tables.

CLASSIFICATION OF THE ATTENDANCE OF STUDENTS AT THE ROCHESTER SCHOOL OF MEDICINE AND DENTISTRY: 1926-27

Students	First year	Second year	Third year ¹	Fourth year ¹	Total
Medical	27 ²	23	...	...	50
Dental	None	None	...	...	None

GEOGRAPHICAL DISTRIBUTION OF THE MEDICAL STUDENTS AT ROCHESTER UNIVERSITY: 1926-27

States (10) and foreign countries (3)	First year	Second year	Total	Number holding bachelor degrees
California	1	3	4	1
Maryland	3	0	3	3
Massachusetts	0	2	2	1
New York	13	16	29	26
Ohio	3	1	4	4
Georgia, Illinois, India, Montana, Nevada, Norway, Pennsylvania, Sweden — one each	7	1	8	6
Total	27	23	50	41

The register of the "Faculty of the School of Medicine and Dentistry and the Staff of the Strong Memorial Hospital of the University of Rochester and the Municipal Hospital of the City of Rochester," for 1926-27, includes a part-time consultant in dental surgery, the Chief Exodontist of the Rochester Dental Dispensary serving in that relation.

ST. LOUIS: PAGE 423

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—156; 1926-27—18. See Table 7. The University now conducts a five-year dental curriculum intended to include the equivalent of a preliminary academic year; present attendance of first-year (pre-dental) students: 51.

Members of the Dental Faculty and of the senior class of the School conduct the clinical work at St. Apollonia House, at 1315 South Grand Boulevard, a dental infirmary exclusively for nuns that was established by the University in November, 1926. The Infirmary has four chairs and is fully equipped for all types of oral health-service.

SAN FRANCISCO: PAGE 273

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by the data in the table on page 649. See also Table 7. The School now conducts a five-year curriculum intended to include the equivalent of a preliminary academic year.

¹ There have been no admissions to advanced standing.

² There are two additional special students of anatomy.

CLASSIFICATION OF THE ATTENDANCE AT THE DENTAL SCHOOL OF THE COLLEGE OF PHYSICIANS AND SURGEONS, SAN FRANCISCO: 1925-27

	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>	
1925-26 Four-year curriculum ("0-4 plan")	52	77	82	79	—	290
1926-27 Four-year curriculum ("0-4 plan")	None	51	81	73	205	
Five-year curriculum ("0-5 plan")	58	..	..	.	58	263

The striking feature in this record is the increase in the size of the first-year class on the new plan as compared with that a year ago on the old plan, notwithstanding the fact that the School in the University of California continues an undergraduate curriculum on the "0-4 plan."

The Faculty has been increased by the addition of three whole-time teachers, of which the School now has nine. The number who serve without salaries has been reduced, during the past two years, from 51 to 40, all of whom give part-time instruction only. The Infirmary now has seven accessory rooms and a total of 115 chairs in active use, including these groups reserved for special instruction: orthodontia, gold foil fillings, preventive dentistry, and ceramics, 24; prosthodontia, 8; oral surgery, 6; examination and roentgenography, 2 each; anesthesia, 1. The building was extensively renovated during the summer of 1926 and much new equipment added in the departments of bacteriology, chemistry, metallurgy, operative dentistry, and physics.

SOUTHERN CALIFORNIA: PAGE 258

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—145; 1926-27—30. See Table 7. The School now conducts a five-year curriculum intended to include the equivalent of a preliminary academic year; present attendance of first-year (pre-dental) students: 119.

Five whole-time teachers, one half-time teacher and one part-time teacher, have been added to the staff. A whole-time technician cooperates in the work of the technical courses. The "science and technic building" has been remodeled to provide a laboratory for physics, an additional lecture room, and several offices for teachers. Changes in the "clinical building" have increased its utility. Considerable equipment in both buildings has been improved. The debt has been reduced to \$20,000 at 6 per cent interest.

TEMPLE: PAGE 521

A department of research, chiefly in dental pathology, is now being organized and equipped from the income of a permanent fund of \$50,000, presented by a former member of the Faculty, Dr. Henry I. Dorr, of Boston, Mass.

The footnote on page 523, although presenting a quotation from successive issues of the Announcement of the Medical School, does not relate to conditions in force at present. No student ever received from Temple University the M.D. and D.D.S. degrees in a six-year combination of medical and dental curricula, and the offer of this opportunity has been withdrawn.

TENNESSEE: PAGE 539

In 1925-26 the dental students in the first, second, and third-year classes at Vanderbilt numbered 18, 18, and 6, respectively. Twenty were admitted to advanced standing at Tennessee after the discontinuance of the Vanderbilt School (page 651). The figures

for the attendance at Tennessee during the past two years are given in the accompanying table.

CLASSIFICATION OF THE ATTENDANCE OF DENTAL STUDENTS AT THE UNIVERSITY
OF TENNESSEE: 1925-27

	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
1925-26	17	1 ¹	28	29	75
1926-27	34	21	14 ¹	20	89

The first of the new buildings in the program for the Health Centre in Memphis has been completed and well equipped. All of the instruction in the medico-dental subjects is now given in this building, and Rogers Hall is used exclusively for the work of the Dental School. A laboratory in charge of a whole-time teacher has been added to the Infirmary to facilitate the clinical work in bacteriology and pathology. These changes afford opportunity for improvement in all aspects of the work for patients.

TEXAS: PAGE 560

This School and that of the University of California are the only dental schools in North America that do not require at least one year of approved work in an accredited academic college for admission to a four-year curriculum or do not include it as the first year in a five-year combination of academic and professional curricula.

Beginning in 1927-28, the School will lengthen the curriculum to five years, to which the minimum entrance requirement will be graduation from an accredited four-year high school or the equivalent in high-school credits. One year of approved work in an accredited academic college will admit a student without condition to the second year of the five-year curriculum.

The active members of the corporation, who have lately decided to convert the School into a non-proprietary institution, are endeavoring to locate several inactive stockholders in order to obtain unanimous approval of the proposed change in status, which is necessary before the corporation can be legally re-chartered.

The Dental Educational Council and the Carnegie Foundation have received formally, from the Secretary of the College, the information in the last two preceding paragraphs, which have been verified by him as correct (November, 1926).

The present attendance, compared with the number of students during the past two years, is shown in the accompanying table.

CLASSIFICATION OF THE ATTENDANCE AT THE TEXAS DENTAL COLLEGE: 1924-27

	<i>First year</i>	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Total</i>
1924-25	25	16	29	23	93
1925-26	36	35	20	38	129
1926-27	51	44	38	22	155

TUFTS: PAGE 384

The School's minimum academic requirement for admission to a three-year undergraduate curriculum, beginning in 1927-28, will be two years of approved work in an accredited academic college.

TULANE: PAGE 359

There are no first-year or second-year students in the School. See Table 7. The urgent need for public support of dental education, and the impossibility of conducting a dental

¹The first group affected by the present entrance requirement of one year of approved work in an accredited academic college. Enforcement of this requirement was begun at Vanderbilt in 1923-24.

school properly on an income from fees alone, are indicated by this statement on page 8 of the School's Announcement for 1926-27:¹

"The Board of Administrators of Tulane University has decided [July 2, 1926] on account of lack of funds to discontinue the School of Dentistry until a sufficient endowment can be obtained to enable the Board to reopen the School upon a sound financial basis. At the end of the Session 1925-26, the School had a considerable deficit and it became evident that this deficit would be increased each year until within a few years the School would be burdened with a large debt. Under these circumstances and in accordance with the fixed policy of the Board to keep the University in all of its departments free from indebtedness, the Board felt compelled with regret and reluctance to suspend the School. It was decided to operate the Clinic for two more years in order to enable all students now in the School to complete their courses and obtain their degrees. In the Session 1926-27, therefore, only the Junior and Senior Classes will be conducted; in 1927-28, the Senior Class alone will be given instruction."

VANDERBILT: PAGE 543

Where educational sincerity is dominant a dental school cannot acceptably conduct its work on an income consisting solely of the fees ordinarily paid by students and patients. Endowment and special support are needed in the public interest. These facts are emphasized by the conditions revealed in the foregoing paragraph and also by the following quotation from an official public statement by the Board of Trust of Vanderbilt University, dated June 21, 1926:²

"Vanderbilt University announces with great regret the suspension for the present of its School of Dentistry. This step is made necessary by a combination of circumstances.

"One year ago the School of Medicine was moved from the South Campus to its new home on the West Campus. During this one year the School of Dentistry has remained in its old quarters, and conducted the school under great difficulties. It is recognized that permanent arrangements for the School of Dentistry will require the erection of a special building on the West Campus adjacent to the School of Medicine, and the provision of adequate endowment for this work.

"Present requirements for admission have greatly decreased attendance. The last large class was graduated in June, 1926. The senior class for next year would have only six students. Altogether there are now only forty-two students left in the School of Dentistry. This fact shows the impossibility of conducting a high-grade professional school of this character without considerable endowment.

"For a number of years, and especially during the last twelve months, efforts have been made in several directions to secure funds sufficient to provide a new building and adequate endowment for teaching dentistry. We regret to say that these efforts have been unsuccessful.

"The University is not willing to allow the quality of its work to decline. Vanderbilt dentists are now filling the highest places in their profession, and it would not be endurable to send out graduates in the future with any training but the best. Better than that is the decision to suspend the School of Dentistry until larger resources are provided for its work.

"If in the future funds can be secured for a building and adequate endowment, the

¹ See page 646 and the section below for statements of similar conditions at Ohio College and Vanderbilt, respectively.

² See page 646 and the section above for statements of similar conditions at Ohio College and Tulane, respectively.

University will be glad to reestablish the department. The training of dentists is a public necessity. It must be provided by public taxation or by private benefactions. Perhaps the suspension of the Vanderbilt School of Dentistry at the present time is the best way to call attention to a need that will become greater and more pressing as the years go by."

VIRGINIA: PAGE 566

The Medical College is endeavoring to raise a special fund of \$1,000,000, to be used chiefly for "physical betterments," in which the Dental School will share proportionately. More than one-half of this amount has been obtained. Beginning in 1927-28 the School will lengthen the curriculum to five years, to which the minimum entrance requirement will be graduation from an accredited four-year high school, or the equivalent in college entrance units. One year of approved work in an accredited academic college will admit a student without condition to the second year of the five-year curriculum. Courses for dental assistants will be offered in 1927-28.

Three annual scholarships of \$125 each have become available to needy dental students from the State of Virginia. These have been awarded on the basis of scholarship, and on prospective fitness for the practice of dentistry. Each scholar who receives at least two awards must agree that, if he obtains a license, he will practise dentistry for fully one year in a Virginia locality in need of dental service. On a new plan of cooperation, members of the Dental Faculty annually give three hours of instruction in clinical dentistry to members of the senior class in the School of Medicine, and one hour of instruction in dental anatomy to medical freshmen.

WASHINGTON: PAGE 417

The School's minimum academic requirement for admission to a four-year undergraduate curriculum, beginning in 1926-27, is one year of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26—61; 1926-27—8. See Table 7.

The library has been effectively card indexed and made readily accessible. The laboratories have been enlarged, in part reconstructed, and made more useful for the instruction of classes of the present size. The teacher who held the professorship that included five subjects, to which attention was drawn on page 422, is now the occupant of the Chair of Dental Pathology, Therapeutics, and Biochemistry, and has been relieved of most of his former administrative duties. The Faculty has been strengthened by the addition of experienced teachers of radiodontia, exodontia, and materia medica.

On page 475 it was noted that although, in 1925-26, the School did not meet the requirements for registration in New York, it was continued nevertheless as a registered school. Handbook 10 for Dentistry, issued by the New York Regents for 1926, places the School on the accredited list, but accredits its four-year professional curriculum for only two years instead of three—the credit accorded both the School in St. Louis University and the Kansas City-Western Dental College, which based their four-year curricula on the same entrance requirement as that of the Washington School.¹

The University has concluded to rebuild the Dental School adjacent to the Medical School, and is seeking sufficient special funds for the purpose. See page 421.

WESTERN RESERVE: PAGE 495

The Trustees, at their meeting in June, 1926, canceled the School's debt of \$229,000. The minimum academic requirement for admission to a four-year undergraduate curric-

¹ The Deputy Commissioner of Education of New York stated, in reply to an enquiry, that this was "an error and [that] . . . the credit has been raised from two years to three years" (December 6, 1926).

ulum, beginning in 1927-28, will be two years of approved work in an accredited academic college.

Beginning in 1929, the degree of B.S. in Dentistry will be conferred by the University upon men and women who, after having had two years of approved work in an accredited academic college, complete the first two years of the dental curriculum at a grade of 80 per cent or more, which is 5 per cent above the passing minimum. Beginning in 1928, the B.A. degree will be awarded to Western Reserve students who, having completed three years of work in one of the undergraduate colleges, pass the first year of the dental curriculum.

A grant of \$1000 by the Research Commission of the American Dental Association has facilitated important dental research in the Department of Anatomy in the Medical School.

DENTAL SCHOOLS IN CANADA

ALBERTA: PAGE 583

ALBERTA is now conducting a full dental curriculum and is giving instruction to its first senior class in dentistry. The attendance during the past two years is shown in the accompanying summary.

CLASSIFICATION OF THE ATTENDANCE OF DENTAL STUDENTS AT THE UNIVERSITY OF ALBERTA: 1925-27

	<i>First year</i> ¹	<i>Second year</i>	<i>Third year</i>	<i>Fourth year</i>	<i>Fifth year</i>	<i>Total</i>
1925-26	10	9	10	7	...	36
1926-27	9	11	10	8	7	45

DALHOUSIE: PAGE 590

Research on the relation between the nerve supply of the teeth and their decay is now in progress with the coöperation of teachers of physiology, embryology, and biology.

In order to promote the training of both men and women for service in public health and preventive dentistry, the medical and dental students are required to attend the pre-school-age and school dental clinics in the University Health Centre. This branch of dentistry offers an exceptional opportunity for women, and the attention of prospective dental students is directed to it.

MCGILL: PAGE 610

The School's minimum academic requirement for admission to a four-year undergraduate curriculum for all of its students, beginning in 1926-27, is two years of approved work in an accredited academic college. The immediate effect on the attendance is shown by these figures for the number of first-year students: 1925-26 — 10; 1926-27 — 3. See Table 7.

MONTREAL: PAGE 605

Beginning in 1927-28, the School's requirement for admission to a four-year undergraduate curriculum will be four years of approved work in an accredited academic college, although the Quebec law defining eligibility to license examinations does not oblige the dental schools to exact more than two preliminary years of study in an academic college. The Faculty has been increased by the addition of a whole-time teacher of clinical dentistry, a half-time teacher in the Department of Surgery, and a half-time teacher in the Department of Dental Morphology. A member of the Medical Faculty gives the seniors

¹The first year is devoted to "pre-dental" work in academic subjects.

twenty-five lectures on general medicine, each of which is followed by a one-hour clinic on physical diagnosis.

The University has purchased 150 acres of land on the west side of Mount Royal Park, two miles from the centre of the city, where the entire University will be rebuilt. In this reconstruction, the dental and medical schools will be closely coördinated. A special annual tax has been imposed by the Provincial Government for the support of the universities. Montreal, expecting to receive annually \$300,000 of this income, beginning in May, 1927, will use it to finance an early loan of from \$3,000,000 to \$4,000,000, including annual payments of interest and of portions of the principal.

TORONTO: PAGE 596

The School's minimum requirement for admission to a five-year undergraduate curriculum, beginning in 1927-28, will be one year of approved work in an accredited academic college.

In coöperation with the Toronto Department of Health, the School conducts a school-children's clinic in the Infirmary. Ten chairs are used for this purpose. During the past two years the library room has been enlarged in size from 722 sq. ft. to 864 sq. ft. and the number of volumes increased by 250. The library is now operated as a department library of the University of Toronto.

SECTION C

SUPPLEMENTARY NOTES, INCLUDING ERRATA

DENTAL EDUCATIONAL COUNCIL: PAGE 102

For the ensuing year, the three bodies represented in the Dental Educational Council will diminish the size of their delegations from six to five, thus decreasing the total membership from eighteen to fifteen. Further reduction, effected conservatively, is strongly indicated. (See page 113.)

The Council, at its last meeting (December 2-4, 1926), continuing its progressive influence, adopted important modifications of its minimum requirements for a Class A or a Class B rating. Heretofore the standing requirements included numbers of hours of instruction in designated subjects, the minimum total for four years having been 4400 hours (pages 120-121), but there was no allocation of subjects to particular years, nor apportionment of the hours for any subject to didactic, laboratory, technical, or clinical work. The mathematical restrictions have been removed. Hereafter the schools, while properly expected to exact a prescribed minimum entrance requirement and to give suitable instruction in specified sciences and arts (page 655), will be free, so far as the Council's rating is concerned, to arrange their professional curricula in accordance with their own judgment, subject only to the Council's determination that in given instances the curricula are adequate for the training that the general practice of dentistry may require.

In the judgment of the Council the curriculum need not prescribe more than a total of about 3700 hours. The Secretary was authorized to issue a statement of this belief, and to suggest the schedule on page 655 as one of many that might be appropriately adopted by any school. The subjects omitted from the schedule, compared with the last previous issue (1922), are these: inorganic chemistry¹ and physics¹ (I), biology¹ (II), comparative dental anatomy (V), oral surgery clinics (VII), orthodontia technics (VII), English¹ and seminar, and technical drawing (IX). The total apportionment for these subjects was

¹ Now required for admission to all acceptable dental schools.

DENTAL CURRICULUM SUGGESTED BUT NOT REQUIRED BY THE DENTAL EDUCATIONAL COUNCIL
(DECEMBER, 1926)

	<i>Hours</i>	<i>Total</i>
<i>Division 1.</i> — CHEMISTRY, ETC.		
Dental metallurgy	48	
Physiological chemistry (including *quantitative analysis)	96	
Organic chemistry ¹	96	240
<i>Division 2.</i> — ANATOMY, ETC.		
Anatomy	240	
Histology and embryology	144	384
<i>Division 3.</i> — PHYSIOLOGY, PHARMACOLOGY, MATERIA MEDICA, AND THERAPEUTICS		
Physiology	144	
Materia medica, pharmacology, and therapeutics	64	208
<i>Division 4.</i> — PATHOLOGY AND BACTERIOLOGY		
Bacteriology	128	
General pathology	80	
Dental pathology and dental therapeutics	96	
*General hygiene and oral hygiene	32	
Physical diagnosis and principles of medicine	32	368
<i>Division 5.</i> — OPERATIVE DENTISTRY, ETC.		
Dental anatomy	112	
Operative technology	160	
Operative dentistry,	96	368
<i>Division 6.</i> — PROSTHETIC DENTISTRY, ETC.		
Prosthetic technology	320	
Crown and bridge technology	192	
Prosthetic dentistry	64	576
<i>Division 7.</i> — ORAL SURGERY, ETC.		
Principles of surgery	16	
Oral surgery	32	
Exodontia	16	
Anesthesia	16	
Radiology	16	
Total number of <i>laboratory</i> hours for oral surgery, exodontia, anesthesia, and radiology	32	128
<i>Division 8.</i> — ORTHODONTIA		
Orthodontia		32
<i>Division 9.</i> — PRINCIPLES OF PRACTICE ²		
Economics, ethics, history of dentistry, jurisprudence		32
<i>Division 10.</i> — CLINICAL PRACTICE ²		
Operative, prosthetic, radiology, orthodontia, oral hygiene, pathology, exodontia, *oral medicine, *oral diagnosis		1,376
Total		3,712

* New subject.

¹ For schools that do not require organic chemistry for admission.

² New title for the division.

556 hours.¹ The changes in the reservations are indicated in the accompanying summary.

The Secretary was authorized to state for the Council, in the use of the foregoing advisory schedule, that "more hours than the number suggested may be justified in a number of the courses, but those responsible for the dental curriculum in a school should make

RESERVATIONS OF HOURS, BY DIVISIONS, IN THE DENTAL EDUCATIONAL COUNCIL'S CURRICULA IN 1922 (REQUIRED) AND IN 1926 (OPTIONAL)

	I	II	III	IV	V	VI	VII	VIII	IX	X	I-X
1922	384	528	208	352	416	736	144	80	176	1376	4400
1926	240	384	208	368	368	576	128	32	32	1376	3712
More in 1926	...	...	...	16	...	...	...	...	...	...	...
Less in 1926	144	144	...	...	48	160	16	48	144	...	688

certain that they are not burdening the students with classroom, clinic or laboratory work so as to make thoroughness and true scientific attainment on their part impossible. . . . The Council disapproves of overloading the curriculum, since this often makes thorough and painstaking study on the part of the student impossible because the student has so much of his time occupied in *doing* that he has little time left for contemplation and thought."

The following quotations from the manuscript of the new edition of the Council's booklet, on "Minimum Requirements for Class A Dental Schools," as revised at the last meeting and about to be published, indicate additional stages of active progress in dental education:

"Pre-professional education given either by a dental faculty in a dental school or not mainly under the auspices of the academic college does not meet the minimum requirement in the sense in which the Council now expects this standard to be enforced. After the close of the academic year 1927-28, a school conducting such a first-year curriculum will not be eligible for a Class A or Class B rating."

"In a dental school requiring *one* year of prescribed college work for admission, the course must be four years in length. . . . In a school that requires *two* years of prescribed college work for admission, the course of study must be at least three years in length, each year [on either plan] to consist of not less than thirty-two weeks, exclusive of vacations, and teaching should continue for six days of each week."

"Up to and including the session of 1931-32, dental schools offering graduate curricula leading to higher degrees may admit to such courses graduates of Class A or Class B dental schools who have completed three-year or four-year curricula leading to the professional degree in dentistry only. Up to and including the session of 1931-32, it will be considered appropriate to award such graduate students the degree of B.S., unless the student is already in possession of this degree, in which case the Master's degree may be given."

"Curricula consisting in the main of practice work, or of short courses in technical procedures, shall not be considered to satisfy the requirements for higher degrees."

"A school which in the judgment of the Council (1) cannot meet the requirements [for a Class A or Class B rating] . . . without extensive improvement and complete reorganization, or (2) which is conducted for profit to individuals or to a corporation, or (3) which does not meet any other minimum requirements that are regarded as essential for an acceptable school, is not acceptable and shall be designated as Unclassified."²

¹Of a general reservation of 208 hours for inorganic chemistry and metallurgy, 156 have been allotted here to inorganic chemistry.

²This new definition eliminates the grade of Class C, and substitutes "Unclassified" for it. The Cincinnati College of Dental Surgery and the Texas Dental College—Class C schools heretofore—are now unclassified schools. The Dental School of the University of California is also in this group for the reason stated on page 639.

“The Council believes that a good working relationship with a hospital in the correlations between clinical dentistry and clinical medicine is a desirable feature of the training for the practice of dentistry.”

“In the opinion of the Council the public interest requires that dental and medical schools should effect the closest possible correlation in their related work. A university centre for education in health service cannot be complete without a dental school.”

TWO-THREE-GRADUATE PLAN: PAGES 181-206

Further experience at Marquette: page 197

In a paper on “the eventual dental curriculum,” read at a meeting of the Section on Dental Education of the Seventh International Dental Congress (August, 1926), the Dean of the Dental School of Marquette University, referring to the conditions mentioned on page 198, included these remarks:

“The quality of the work done during the past year by the . . . first-year dental students [admitted after two years of work in an academic college] met with our expectations. . . . These students, as a group, excelled the sophomores in the four-year course in the medical sciences, and, by the end of the year, they equaled the sophomores in the dental technic courses, notwithstanding the fact that the sophomores had had the seeming advantage of an additional year of instruction in technic work. . . . The members of our Faculty have found that they can demand more from these well-trained students, and, as a result, it is possible to teach them more in a given time. The capacity that these men have to assimilate new facts related to the medical sciences as well as to mechanical procedures is very satisfactory. Our technic courses are freed from duplication and we can emphasize fundamental principles rather than the mere technical procedures.”¹

DATA ON THE NUMBER OF DENTAL HYGIENISTS: PAGE 73

The data in the accompanying summary, and in Tables 8 and 9 of this Appendix, supplement the statement on page 78 regarding the number of dental hygienists in active practice.

NUMBER OF GRADUATES OF THE THREE OLDEST SCHOOLS FOR DENTAL HYGIENISTS

	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	Total
Columbia	93	33	7	27	35	48	54	44	36	46 ²	423
Forsyth	13	23	21	34	39	51	69	60	67	63 ²	440
Rochester	38	40	24	57	58	63	79	45	49	44 ²	497
Total	144	96	52	118	132	162	202	149	152	153	1,360

FORSYTH DENTAL INFIRMARY FOR CHILDREN: PAGE 389

Memorial Foundation

The Forsyth Dental Infirmary for Children was founded by John Hamilton Forsyth and Thomas Alexander Forsyth in memory of their brothers, James Bennett Forsyth and George Henry Forsyth. The Infirmary was incorporated in 1910 by a special act of the Massachusetts Legislature.

¹ Shortly after the presentation of this paper, its author was elected President of the American Dental Association for 1926-27.

² Total present attendance (1925-26).

AMERICAN DENTAL ASSOCIATION : PAGE 33

*Scientific Foundation and Research Commission : page 159*EXPENDITURES FOR RESEARCH : 1920-26; IN EXTENSION OF THE DATA IN THE TABLE ON
PAGE 160¹

(Compiled from annual reports of the Secretary of the Commission)

	1920-25	1925-26	Total
T. B. Hartzell, ² College of Medicine, University of Minnesota	\$17,925	\$3,567	\$21,492
P. R. Howe, Forsyth Dental Infirmary, and Harvard Medical School	12,297	3,550	15,847
G. S. Millberry, ¹ College of Dentistry, University of California	7,477	1,700	9,177
W. H. G. Logan, Chicago College of Dental Surgery	3,300	... ³	3,300
A. D. Black, Dental School, Northwestern University	8,000	2,929	10,929
A. D. Black, Dental Index Bureau	11,002	...	11,002
Henry C. Ferris, New York City	2,150	...	2,150
M. L. Ward, R. W. Bunting, and U. G. Rickert, ¹ College of Dental Surgery, University of Michigan	5,400	2,000	7,400
H. B. Tileston, School of Dentistry, University of Louisville	4,125	1,500	5,625
E. H. Bruening and C. E. Woodbury, College of Dentistry, Creighton University	717	...	717
F. O. Hetrick, For the West Texas Dental Society	1,089	910	1,999
F. V. Simonton, For the Stomatological Research Group, Univ. of California	2,925	1,800	4,725
F. O. Hetrick, For the Nebraska State Hospital	500	...	500
Hermann F. Prinz, Dental School, University of Pennsylvania	...	995	995
F. C. Waite, Medical School, Western Reserve University	...	309	309
Total amount of the expenditures	\$76,907	\$19,260	\$96,167

Number of individuals to whom payments were made
from these grants⁴

... 23 ...

¹ The funds appropriated for the support of the researches at the University of California and at the University of Michigan were paid to the fiscal representatives of the universities and by them transferred to the corresponding collaborators. In all other instances payments were made directly to the collaborators by the Secretary-Treasurer of the Commission upon proper detailed requisition from the advisers, each of whom is named in this table. See footnote 2.

² The names of individuals as advisers were used by the Commission to differentiate the grants, but in no case did an adviser receive remuneration. He served solely as an unpaid adviser of collaborators to whom the funds were paid and who conducted the researches in the institutions specified. See footnote 1.

³ The mark, . . . , indicates no grant.

⁴ A renewed grant of \$600 to the United States Bureau of Standards was not used. See the footnotes on page 160 for previous references to unused grants.

DENTAL SCHOOLS IN THE STATE OF NEW YORK

Attendance under recent conditions: pages 468 and 469

A continuing effect of the current measures in New York forcibly to increase the quantitative requirements in dental education, without allowance for important qualitative deficiencies or prevailing economic conditions, is shown by the data in this summary:

		First year	Second year	Third year	Fourth year	Total		
Buffalo:	1922-23	46	21 ¹	50	64	181		
	1923-24	58	51	20 ¹	54	183		
	1924-25	9 ²	47	46	26 ¹	128		
	1925-26	27	7 ²	49	51	134		
	1926-27	33	18	9 ²	50	110		
New York:	1922-23	110	88 ¹	266	225	689		
	1923-24	185	105	87 ¹	263	640		
	1924-25	203	163	104	90 ¹	560		
	1925-26	147 ³	167	157	107	578		
	1926-27	46 ²	126	145	163	480		
College of Dental and Oral Surgery:	1922-23	149	92 ¹	188	172	601		
Columbia (old): ⁴	1922-23	8	5	3	4	20 ⁵		
Columbia (new): ⁶	1923-24	133 ⁶	142	78 ¹	179	532		
	1924-25	35 ²	111	143	90 ¹	379		
	1925-26	25	31 ²	109	138	303		
	1926-27	34	25	31 ²	107	197		
Rochester: ⁷	1925-26	None	..	..	..	None
	1926-27	None	None	..	..	None
Total number in all of the New York Schools ⁸		1920-21	1921-22	1922-23	1923-24	1924-25	1925-26	1926-27
		1,681	1,463 ¹	1,491	1,355	1,067	1,015	787 ^{2,9}

¹ The first group affected by the general minimum entrance requirement of one year of approved work in an accredited academic college.

² The first group affected by the general minimum entrance requirement of two years of approved work in an accredited academic college.

³ The attendance was limited to a maximum of 150.

⁴ The entrance requirement from the beginning (1916-23) was two years of approved work in an accredited academic college.

⁵ See footnote 4. The maximum attendance was attained in 1922-23.

⁶ The entrance requirement was one year of approved work in an accredited academic college for the consolidated schools in 1923-24; it has been two years since 1924-25.

⁷ The Rochester School, requiring three years of approved work in an academic college for admission, announced its readiness to receive students beginning in 1925-26. No one has qualified for admission as a student of dentistry.

At the meeting of the American Association of Dental Schools in 1925 (*Proceedings*, page 112) the Assistant Commissioner and Director of Professional Education of the State of New York made this statement: "We do believe, however, that for our state, with medical education in the flux as it is, with a population such as we have to deal with largely in the great city of New York, and with a dental school at Rochester that is putting on three years of pre-dental work and four years of dental instruction . . . a dental school should have the same three years that a medical school has for admittance and that it should have the four-year course." [Italic does not appear in the original.] It is improbable, however, that official plans to favor Rochester University will be helpful until it organizes a dental faculty (page 467).

⁸ The steady decline in the attendance need not cause alarm in New York, for, in order to obtain students from that state, several schools in other states, by adjusting their policies to successive evolutions of the official New York preferences (page 534), have been helping New York to maintain its local exactions and also to meet its need for an increasing number of dental practitioners.

⁹ Present attendance (November, 1926).

DATA PERTAINING, IN 1925, TO POPULATION, NUMBER OF PRACTITIONERS OF DENTISTRY AND MEDICINE, AND MINIMUM ACADEMIC REQUIREMENTS FOR ADMISSION TO PRACTICE, IN THE STATES AND PROVINCES OF THE UNITED STATES AND CANADA, RESPECTIVELY (RECAPITULATION OF DATA IN PART VI)

State or province	Population	Total number of practitioners		Ratios			Minimum requirement in academic education for admission to practice ¹	
		Dentists	Physicians	Practitioners (1) to population (x)		Dentists (1) to Physicians (x) 1 : x	Dentistry	Medicine
				Dentists 1 : x	Physicians 1 : x			
United States								
Alabama	2,456,370	530	2,284	4.635	1.076	4.3	H-S	C-2
Arizona	401,016	119	378	3.369	1.061	3.2	None	C-2
Arkansas	1,843,750	423	2,212	4.359	834	5.2	None	C-2
California	3,967,278	3,943	8,363	1.006	474	2.1	H-S	C-1
Colorado	1,012,044	756	1,837	1.339	551	2.4	H-S	C-2
Connecticut	1,517,562	968	1,884	1.568	806	1.9	H-S	C-1
Delaware	233,654	94	256	2.486	913	2.7	None	H-S
District of Columbia	492,421	564	1,813	873	272	3.2	H-S	C-2
Florida	1,079,637	501	1,452	2.155	744	2.9	None	C-2
Georgia	3,043,493	864	3,122	3.523	975	3.6	None	C-2
Idaho	486,597	279	416	1.744	1,170	1.5	H-S	C-2
Illinois	6,921,342	4,435	10,743	1.561	644	2.4	H-S	C-2
Indiana	3,048,596	1,705	4,251	1.788	717	2.5	C-1	C-2
Iowa	2,496,337	1,684	3,378	1.482	739	2.0	H-S	C-2
Kansas	1,809,588	1,050	2,364	1.723	765	2.3	H-S	C-2
Kentucky	2,481,896	782	3,041	3.174	816	3.9	H-S	C-2
Louisiana	1,871,705	668	1,991	2.802	940	3.0	H-S	C-2
Maine	781,220	502	1,037	1.556	753	2.1	H-S	C-2
Maryland	1,529,137	727	2,313	2.103	661	3.2	None	C-2
Massachusetts	4,102,626	3,321	6,187	1.235	663	1.9	H-S	H-S
Michigan	4,110,423	2,063	4,837	1.992	850	2.3	C-1	C-2
Minnesota	2,547,511	1,833	2,823	1.390	902	1.5	H-S	C-2
Mississippi	1,790,618	387	1,702	4.627	1,052	4.4	H-S	C-2
Missouri	3,461,078	2,120	5,806	1.633	596	2.7	H-S	H-S
Montana	637,904	342	525	1.865	1,215	1.5	None	C-2
Nebraska	1,350,015	970	1,869	1.392	722	1.9	H-S	C-2
Nevada	77,407	50	129	1.548	600	2.6	H-S	H-S
New Hampshire	449,526	258	601	1.742	748	2.3	H-S	C-2
New Jersey	3,474,561	2,661	3,567	1.306	974	1.3	H-S	C-2
New Mexico	377,371	95	365	3.972	1,034	3.8	H-S	C-2
New York	11,040,134	9,923	17,671	1.113	624	1.8	C-2	C-2
North Carolina	2,740,841	810	2,281	3.384	1,202	2.8	H-S	C-2
North Dakota	682,828	289	485	2.363	1,408	1.7	H-S	C-2
Ohio	6,270,435	3,295	8,113	1.903	773	2.5	H-S	H-S
Oklahoma	2,219,422	746	2,524	2.975	879	3.4	H-S	C-2
Oregon	840,362	870	1,176	966	715	1.4	H-S	C-2
Pennsylvania	9,263,317	5,037	11,140	1.839	832	2.2	C-1	C-1
Rhode Island	636,218	386	771	1.648	825	2.0	None	C-2
South Carolina	1,770,415	365	1,317	4.850	1,344	3.6	H-S	C-2
South Dakota	663,668	354	604	1.875	1,099	1.7	H-S	C-2
Tennessee	2,416,732	927	3,115	2.607	776	3.4	H-S	C-2
Texas	5,058,089	1,511	6,063	3.348	834	4.0	None	C-2
Utah	488,562	295	505	1.656	967	1.7	H-S	C-1
Vermont	352,428	174	537	2.025	656	3.1	H-S	C-2
Virginia	2,436,693	674	2,534	3.615	962	3.8	C-1	C-2
Washington	1,467,162	1,157	1,781	1.268	824	1.5	None	C-2
West Virginia	1,588,637	601	1,753	2.643	906	2.9	None	C-2
Wisconsin	2,785,649	1,940	2,826	1.436	986	1.5	H-S	C-2
Wyoming	219,347	118	255	1.859	860	2.2	H-S	H-S
Total	112,793,622	64,166	146,997	1.758	767	2.3	33 H-S	39 C-2
Canada								
Alberta	651,700	202	562	3.226	1,160	2.8	H-S	C-1
British Columbia	560,500	292	610	1.920	919	2.1	None	C-1
Manitoba	656,400	237	524	2.770	1,253	2.2	H-S	C-1
New Brunswick	403,300	167	271	2.415	1,488	1.6	H-S	H-S
Nova Scotia	536,900	177	457	3.033	1,175	2.6	C-1	C-2
Ontario	3,103,000	1,782	3,839	1.741	808	2.2	H-S	C-2
Prince Edward Island	87,300	24	72	3.638	1,213	3.0	None	H-S
Quebec	2,520,000	609	2,274	4.138	1,108	3.7	C-2	C-1
Saskatchewan	893,000	236	512	3.530	1,027	2.2	H-S	H-S
Total	9,352,100	3,726	9,121	2.510	1,025	2.4	5 H-S	4 C-1

¹The symbols are those used in Table 1 on page 623. H-S=graduation from a high-school; C-1=one year of approved work in an accredited academic college or the first year in a combination of academic and professional curricula; C-2=two years of the work indicated by C-1. The requirements are those specified by statute, or exacted by boards of examiners within their official discretion.

DATA PERTAINING, IN 1925, TO POPULATION, AND TO NUMBER OF PRACTITIONERS OF DENTISTRY
AND MEDICINE, IN THE CITIES IN THE UNITED STATES AND CANADA THAT CONTAIN
DENTAL SCHOOLS (RECAPITULATION OF DATA IN PART VI)

City	Population	Total number of practitioners		Ratios		
		Dentists	Physicians	Practitioners (1) to population (x) Dentists 1: x	Physicians 1: x	Dentists (1) to Physicians (x) 1: x
United States						
Ann Arbor	21,936	47	163	467	135	3.5
Atlanta	230,083	273	633	843	363	2.3
Baltimore	790,617	523	1,468	1,511	539	2.8
Boston	779,975	1,190	2,269	655	344	1.9
Buffalo	549,550	457	950	1,203	578	2.1
Chicago	2,968,922	2,928	5,729	1,014	518	2.0
Cincinnati	408,559	369	901	1,107	453	2.4
Cleveland	924,493	730	1,397	1,266	662	1.9
Columbus	271,022	227	599	1,194	452	2.6
Dallas	190,655	143	494	1,333	386	3.5
Denver	278,691	376	809	741	344	2.2
Houston	162,508	137	342	1,186	475	2.5
Indianapolis	354,945	333	734	1,066	484	2.2
Iowa City	15,289	17	50	899	306	2.9
Kansas City (Mo.)	363,565	427	1,002	851	363	2.3
Kansas City (Kansas)	115,949	64	171	1,812	678	2.7
Lincoln	60,396	111	229	544	264	2.1
Los Angeles	1,100,000	998	2,273	1,102	484	2.3
Louisville	258,862	194	596	1,334	494	3.1
Memphis	173,380	168	492	1,032	352	2.9
Milwaukee	497,946	530	742	940	671	1.4
Minneapolis	421,357	594	791	709	532	1.3
Nashville	123,822	124	361	998	343	2.9
New Orleans	412,014	263	651	1,567	633	2.5
New York	6,059,444	6,624	10,768	915	563	1.6
Omaha	209,846	219	478	958	439	2.2
Philadelphia	1,965,220	1,541	3,502	1,275	561	2.3
Pittsburgh	678,788	634	1,226	1,071	554	1.9
Portland	280,192	463	582	605	481	1.3
Richmond	185,063	130	384	1,423	482	3.0
Rochester	315,245	280	510	1,126	618	1.8
St. Louis	817,120	739	1,861	1,106	439	2.5
St. Paul	244,973	303	418	808	586	1.4
San Francisco	552,907	882	1,456	627	380	1.7
Washington	492,421	564	1,813	873	272	3.2
Total	23,275,755	23,602	46,844	986	497	2.0
Canada						
Edmonton	65,378	57	139	1,147	470	2.4
Halifax	55,000	37	95	1,487	579	2.6
Montreal	950,000	393	1,050	2,417	905	2.7
Toronto	549,429	645	1,086	852	506	1.7
Total	1,619,807	1,132	2,370	1,431	683	2.1

INCREASE IN THE NUMBER OF DENTAL PRACTITIONERS IN CONTINENTAL UNITED STATES, AS SHOWN AT EACH FEDERAL CENSUS SINCE 1850: PAGES 83 AND 85

	1850	1860	1870	1880	1890	1900	1910	1920
Number of dentists	2,923	5,606	7,839	12,314	17,498	29,665	39,997	56,152
Increase at each census:								
Actual	...	2,683	2,233	4,475	5,184	12,167	10,332	16,155
Percentage	...	91.8	39.8	57.1	42.1	69.5	41.0	40.4
Women	None	None	24	61	337	807	1,254	1,829

These relative increases have regularly been larger than those of the general population.

NUMBER OF GRADUATES OF THE DENTAL SCHOOLS IN THE UNITED STATES: 1841-1926¹

The records of the number of graduates of the American dental schools are very incomplete. The total number from 1841 to 1926, inclusive, is approximately 85,000.

TERRITORIAL AND INSULAR POSSESSIONS OF THE UNITED STATES

Dentistry and dental education

The practice of dentistry is regulated by law or executive order in Alaska, Hawaiian Islands, Panama Canal Zone, Philippine Islands, Porto Rico, and Virgin Islands. In Guam and Samoa, dentistry is practised only by officers of the Dental Corps of the United States Navy. There are boards of dental examiners in Alaska, Hawaiian and Philippine Islands, and Porto Rico. In the Virgin Islands examinations for the license are conducted by the Board of Medical Examiners. General societies of dental practitioners have been organized in the Hawaiian and Philippine Islands, and in Porto Rico. Graduation from a reputable dental school is a general prerequisite to admission to practice. The Hawaiian law regulates the practice of dental hygiene and there is a school for dental hygienists in Honolulu. Public dental infirmaries have been established in the Hawaiian and Philippine Islands, and in Porto Rico.

In 1925 the total number of dental practitioners in the territorial and insular possessions of the United States was 708, distributed as follows: Alaska, 43; Guam, 2; Hawaiian Islands, 66; Panama Canal Zone, 10; Philippine Islands, 440; Porto Rico, 142; Samoa, 1; Virgin Islands, 4.

There are no dental schools in any of the territories or insular possessions of the United States except the Philippine Islands, where there are four.² Before the American occupation in 1898, dentistry could be practised without restraint by any one disposed to undertake it, and apprenticeship and self-training were the common methods of preparation, although the Dental School in the University of Santo Tomas, organized in 1886, trained dental practitioners until 1916. The first dental statute was adopted in 1903. The Philippine Dental College, the oldest of the existing dental schools, was founded in 1913 and has had nearly 300 graduates (1916-26). Dental schools were organized in the University of the Philippines in 1915, and in the National University in 1924, the former having about 100 graduates (1919-26) and the latter an enrollment of 81 (1924-25). The College of Dentistry for Women was founded in 1925, and is affiliated with the Centro Escolar de Señoritas. All of the existing dental schools in the Philippines are situated in Manila.

¹ The number of graduates of the Canadian schools is indicated on page 217.

² See Aldecoa: "Dental Education and the Philippine Dentist." Paper read at the Seventh International Dental Congress (August, 1926). To be published in an early issue of the *Journal of the American Dental Association* (1927).

ERRATA

Page *xii*: sixth line from bottom. The numerals 1924-25 should be 1924-26.

Page 35: fourteenth line from the top. The state boards that participated in the organization of the National Association of Dental Examiners were those of Georgia, Illinois, Indiana, Iowa, Michigan, Ohio, *Pennsylvania*, *New Jersey*, and Vermont.

Page 42: Table; New York College of Dental Surgery, Syracuse. Instruction was begun informally in 1851, before the charter was granted in 1852. See page 454.

Page 140: Table. On the line for Illinois there should be a plus sign in the column for dental extension teaching, which was begun at Illinois in June, 1925. The total at the bottom of the column should be 8. See page 631.

Page 151: Table 4. In 1922-23 the current expenditures were \$1800 greater—in 1923-24, \$1850 more—than the recorded totals. In 1924-25 the income was \$18,498 larger than the amount noted. Equivalent corrections are required in the amounts for surplus or deficit in these years. In the calculation of the general net deficit for 1924-25, the amount for the estimated additional expenditure was used instead of the total expenditure (direct plus estimated) in excess of dental income. The corrected amounts are given in Tables 2 and 8, on pages 625 and 636, respectively.

Page 220: Table 2. The total amount of current income for 1921-22 should be \$397,552 instead of \$397,557. For 1924-25, current income should be \$324,090; current expenditures, \$343,297; "excess of expenditures over dental income in the university schools," \$98,311; general net deficit, \$117,518; and average net deficit per school, \$23,504. The correct figures are given in Tables 2 and 9, on pages 625 and 637, respectively.

Page 220: Table 3. The amounts in the first two lines present the estimated values in the preceding Table 2. To show "direct appropriations," the first three lines in Table 3 should carry these amounts:

	1920-21	1921-22	1922-23	1923-24	1924-25
Total amount of direct appropriations by universities to dental schools, in excess of tuition and infirmary fees and of all other current income	\$17,654	\$26,246	\$24,881	\$37,280	\$46,918
Average amount of the appropriations	8,827	8,749	8,294	12,427	15,639
Number of schools to which these appropriations were made	2	3	3	3	3

Page 285: Table; last line. In the second column, 3.00 is a misprint for 30.0.

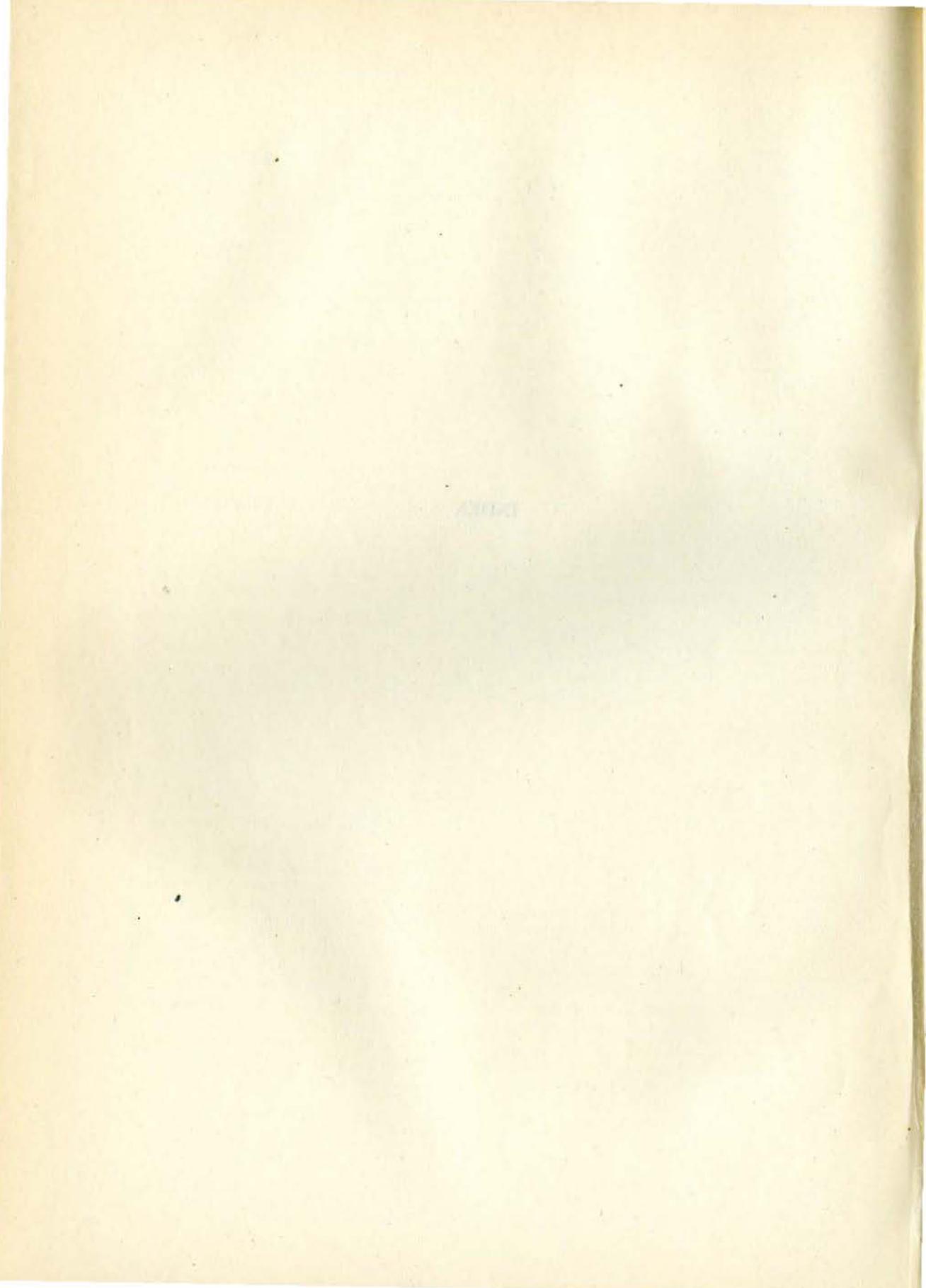
Page 309: Florida; sixth line. Although there is no legal requirement in preliminary education before admission to the study of medicine, two years of approved work in an accredited academic college is the practical exaction because none but graduates of Class A schools are admitted to the license examination. This fact is noted in the table on page 660.

Page 309: Georgia; end of second line. The ratio of dentists to physicians should be 1:3.6 instead of 1:6.3. This correction is noted in the table on page 660.

Page 394: Michigan; end of second line. The ratio of dentists to physicians should be 1:2.3 instead of 1:23. This correction is noted in the table on page 660.

Page 456: eighth line from top; number of visits in 1924-25. Instead of "65,664 including 957 for treatment in orthodontia," the statement should read: 65,415 including 708 for treatment in orthodontia. This correction is noted in the table on page 631.

General Note. In Part VI, in the statements of the cumulative percentage results of license examinations for 1910-25, the data relate to shorter periods for several schools that were organized or reorganized during the years 1910-15, although that fact is not always indicated. The year in which students first graduated is specified for each school in the corresponding statistical summary.



INDEX

IN this index, page numerals for the dental schools show the location of corresponding sections of statistical data which, compiled in Part VI on a uniform plan to facilitate reference, have not been detailed here. The tables and notes on pages 622-637 of the Appendix, which consist of data relating to all of the existing dental schools (1920-26), are not correlated here with the individual schools, but are indexed under "Statistical data" and other general terms.

- ACADEMIC colleges:** attendance; statistical data, 184, 205.
- Pre-dental education; advantages of at least two years of study, 181.
- Desirability of extra courses in oral hygiene, mechanics, and fine art, 185, 186.
- Present tendencies; need for rededication to fundamentals, 184.
- Proposed extra courses; prospective dentists, 182, 185, 186, 203, 240.
- See also* Pre-professional education.
- Academic subjects: dental curriculum; distinguished from medico-dental and dental subjects, 249. *See also* Academic college.
- Academic year: dental schools; length; proposed extension, xvii (footnote), 18, 188, 206, 240, 639.
- Summary of minimum requirements in length (since 1840), 55.
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- Acknowledgments: general; xxi, 241, 245, 250.
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- Admission requirements: dental and medical schools contrasted, 17, 125, 126 (table).
- Dental schools (tables), 55, 122, 124, 623.
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- See also* Dental curriculum, Pre-professional education.
- Advanced courses: general dental practitioners; schools that provide courses (tables), 140, 631.
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- Infantile; dentistry responsive, 148.
- Journal of the American Dental Association;* promotes sale of products of doubtful value, 163, 235.
- Rochester University; for dental students, 467.
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