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LA THÈSE A ÉTÉ
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SOCIAL CONTROL AND SCHOOL ARCHITECTURE!

A BRIEF HISTORY OF THOUGHT ON ELEMENTARY EDUCATION
AND
SCHOOL BUILDING DESIGN

by

© Attila Horváth

A dissertation
submitted in partial fulfilment
of the requirements for the degree of
Doctor of Philosophy
at Dalhousie University

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Abstract

"First we shape the buildings and then the buildings shape us." - said Sir Winston Churchill touching on an important medium of social control, architectural space. The thesis is an attempt to reveal the methods by which educators and architects intend to "shape us" by the means of designing schools. Classrooms, corridors, halls and offices continuously 'teach' whenever students are around; they encourage or prohibit sets of activities and, consequently, convey values about distinct behaviours. A comparison between the written and the built philosophy of education at different times in the history of education may contribute to a better understanding of changing pedagogical ethoses. The scrutiny of a number of designs of schools in England, Germany and North America in the past one and a half centuries resulted in establishing certain types of order of spaces in educational facilities. The following archetypes of spatial-social control are discussed: 1. Utilitarian, that kept the principle of efficiency in the first place by repressing undesirable behaviours; 2. Prussian militaristic, which was based on personal charisma and on excellent bureaucratic organization; 3. Scientific, that united the teachers of the world under the aegis of the Science of Pedagogy and focussed on the content of education; 4. Progressive, the chief concern of which was for the child and gave priority to creative activity in education; 5. Systematic, that helped to shift control from dictation to stimulation. While control seems to be present in every school at every time, its manifestation became more covert through time.

CHAPTER ONE

Introduction

Educational sociology has changed in recent years. Contrary to earlier emotionally heated Marxist approaches, authors like Apple (1979) have emphasized that the

[P]rocess of reproduction is not caused (in the strong sense of that concept) by an elite group of managers who sat or sit around tables plotting the ways to 'do in' their workers at both the workplace and the school. ... this reproductive process is a 'logical necessity' for the continued maintenance of an unequal social order. (Apple 1979:40)

Order differs in various societies but an effort on behalf of the social institutions to make the new generations as loyal as possible to that order is omnipresent. Perhaps this is the modern school's main objective. The aim of education in the nineteenth and twentieth centuries may have been to inculcate values by which people might relate themselves to nature and society. The question, however, of how this takes place is still not adequately answered. When sociologists talk about the 'hidden curriculum' one gets the feeling that it just 'happens', that it is neither planned

nor consciously implemented by teachers. Educational philosophers who have investigated the concept arrive at a similar conclusion (Barrow 1981). Apple (1979), for example, suggests that the hidden curriculum in science teaching is present when a 'conflictless' science history is taught in schools. I think, though, that teaching a conflictless science curriculum is teaching a "bad" curriculum (if we accept that there were conflicts in the sciences) and not a hidden one. The content of the curriculum is subject to academic debate. The hidden curriculum is at work, in my opinion, when a 'good' (in our case, not conflictless) curriculum is taught but still, the students think and act as if they were taught a conflictless science. In this case a surprise is the apparent outcome of the teaching. It is a surprise in that the overt aims of the overt curriculum are not achieved, yet the real outcome is a success with respect to the hidden aims of the hidden curriculum. The hidden curricular aims are, by nature, covert but that does not imply that they cannot be revealed, and neither does that mean that they might not be consciously planned. In this thesis I will argue that the making of the hidden curriculum is a conscious and designed process, that it exists only on a different plane than the overt planning, and, therefore, that the researcher may have to look for it somewhere else than in the works of educational philosophers. I have to emphasize that, in my

use of the phrase, the hidden curriculum is not something that happens inadvertently, accidentally or against the will of the teacher. On the contrary, in this study the hidden curriculum is perceived as the unadvertised part of what is taught in schools, the presumptions hidden in the content of the overt curriculum and the values, expected behaviours and attitudes which are not always expressed in the formal curriculum.

In an attempt to outline the theory of the hidden curriculum it is necessary to define how educational theory (overt and covert) relate to educational practice. In fact, theory and practice are not only separate concepts but they are split in themselves. I distinguish the theory which is exercised by educational philosophers and theorists (this is the practice of theory) which has little influence on classroom activities and which has its own autonomous, academic realm. Sometimes educational theory is not stimulated by education that takes place in schools; but more often than not philosophers and theoreticians learn from each other and not from the school. On the other hand, there is the school or the educational practice which has its own subtle theory, the theory of practice. This theory provides the legitimization of everyday schooling practices, it is 'written' by teachers, administrators, and relative laymen like school building architects. This theory is what practical men have in mind when they think about schools and

it is definitely different from that of the educational theorist. The ideas of principals, teachers, and janitors, may be what they have filtered from general theories and may involve the distortion of academic theories to fit daily practice.

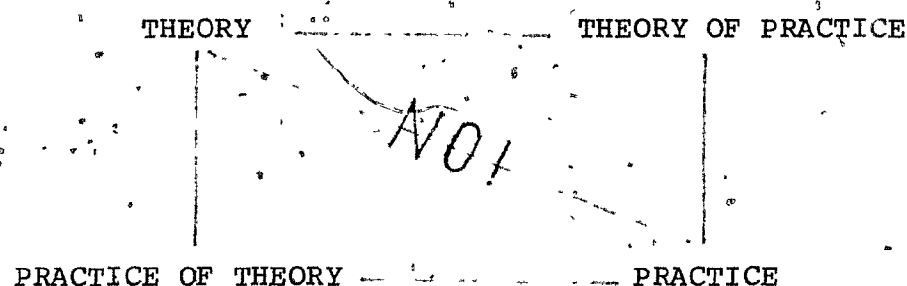


Fig. 1. Relationships between theories and practices

This simple diagram is intended to show how analysis can be done between the content of overt theories and the ways they are forged, or between the school's everyday practice and how the justification of that practice is coined. Sociologists exploit both directions: there is an abundance of material available on the subject of how scientific theories are made and there is also a voluminous literature which inquires into the ways of schools, children and their teachers. In this study my concern is at the theoretical level, and I will attempt to put side by side the overt and the covert theory of schooling. It would, of course, exceed the limits of any study to investigate all the aspects of

the theory of practice in all cultures and times. This research focusses on one particular aspect: the control over children in schools. Control, in this thesis, is conceived to be the regulation of the functioning of schools as organizational systems. I use the word 'control' in the organizational theoretical sense, i.e. as being a collection of regulative rules and processes which enable the system to run smoothly. I will examine how control was conceived in theory and how it was perceived on the plane of the theory of everyday practice. In order to interpret the theory of the practice of control I will use four dimensions to locate certain attitudes: a hidden theory will be compared to (1) overtly fashionable ideas, (2) theories and practices of control in other, non-educational fields of social life, (3) hidden theories of different national cultures, and (4) hidden theories of different times. The overall scope of the research is limited to modern elementary mass education. In searching for material which would help me to unveil the 'theory of practice' in different cultures, I found myself investigating school designs, and what educators found necessary in a teaching environment in order to function properly. I believe my analysis of texts on school architecture and of actual designs have provided me with circumstantial evidence of educational practitioners' intentions. Seaborne suggested that

[I]t is possible to study changing educational ideas and teaching methods through the sequence of buildings and such a study is a valuable supplement to what can be learnt from purely written sources. (Seaborne 1971a:5)

In this way we arrive at a history of education different from that of the history of theories. The question is, how?

Investigating the history of school buildings is not an original idea in itself, although there is a scarcity of such work. In the English language there seem to be only two major works published which are devoted to the subject. Both studies are about the development of a national system: one is on English (Seaborne 1971a; Seaborne-Lowe 1977) and the other on Australian school architecture (Burchell 1980). The approach of the authors is positivist in both cases. They present an enormous compilation of historical data but there is hardly any attempt to interpret and furnish the data with meaning. School architecture is viewed in these works as being the result of political conspiracies and social and economical changes. This is, surely, one legitimate way of looking at schools and both studies have provided me with invaluable raw material. Historical studies of minor scope and importance also contain interesting fragments of information (Sloane 1972; Wriston 1963). Studies published in German were a great help in establishing arguments on the development of Prussian-German school architecture (Lange 1967; Schmidt 1967).

Short studies, mostly from the "Introduction" chapters

of books on school buildings, make up the other part of the literature. Of these only a few profound studies are wary of establishing close relationships between educational philosophy and school buildings (e.g. Godfrey-Castle Gleary 1953; Seaborne 1971b). Most of the writers, thinking of their "historical chapter" as only a prelude to their own thoughts, risk far reaching and usually shallow assumptions and parallels. Manning, for example, simply states that

The theoretical and practical activities such as Froebel, Pestalozzi, Dewey, Montessori, A. S. Neill, Whitehead and others during the last hundred years have fundamentally altered the theory and practice of primary education in this country. (Manning 1967:71)

The nature of the change is unequivocally expressed in all studies: it is not simply a change from this to that, it is a shift from the bad, inadequate, authoritarian, stupid and boring, to the good, adequate, democratic, smart and exciting. Taylor and Vlastos put it bluntly:

We have closeted our children for years in sterile monochrome classroom-boxes which house antiquated desks, tables, and inadequate storage systems. There has been little or no relationship between classroom or playroom architecture and what is to be taught to children. (Taylor-Vlastos 1975:8)

The same emotional and incorrect approach characterizes the representative compilation of studies in the Harvard Educational Review (Architecture and Education 1969). School architecture is perceived as the result of developments in educational philosophy in Griffin (1971),

Otto ([1963] 1966), Perkins-Cocking (1949), Roth (1966), West (1970) as well, just to mention a few examples. Some studies even select an idea (e.g. that of flexibility) and regard the history of school buildings as its unfolding process (Bennett et. al 1980; Open Space Schools 1971). Comparative studies of national school building practices are either out-dated (Clay 1906; Robson 1874; Wheelwright 1901) or do not comment on the designs (Otto [1963] 1966; Roth 1966). The only profound comparative study that I have found is merely descriptive and also unfortunately unbalanced, for considerably more space and attention is devoted to German than to Anglo-Saxon schools (Lange 1967).

Sociological studies of school designs or buildings are almost non-existent. Eggleston's (1965) article deserves attention, - his sociological survey took an interesting and unique angle in looking at school buildings. He examined the performance of students in new and old schools and his data suggest that a good, new school building may not be the cause but the indicator of higher pupil achievement. This is to say that student performances in new schools might not have improved because the new building provided learners with a better environment but because the student body has changed. New schools in London were usually the part of the general reconstruction of the area when all the 'rubbish' of the slums had been cleaned out. With the old ones their inhabitants disappeared too, and gave way to new buildings

and new people.

My assumption is that by building schools, architects, concerned citizens and teachers reify the daily theory that governs their practice. This means that I look on the buildings as indicators of certain thoughts instead of viewing them as results. When I look at school buildings as indicators of theories of practice rather than interpreting them as results of theories I use the word indicator to mean a sign of the presence of something which is not apparent. For example, the smoke rising from behind a hill is an indicator of a fire. My intention is to show what second thoughts semi-professionals had while planning education. For example, in Plate I/1 there is a picture of the Stockport Sunday School. Laqueur (1976) realized that the picture did not depict reality in the way a photograph would. What is interesting to me is the way it differs from reality, the idea that made the artist see the school as he painted it. Similar distortions are examined in Chapter II, in which we find a factory room idealized to make the workshop look more spacious (see Plates II/6,7) and in Chapter III in which we find the teacher being idolized (Plate III/17). Here I may give another example of how attitudes can be detected by researching the ways objects are seen. Plate I/2 contains an etching of mule-spinning and the comments of Ure ([1835] 1967) on, most probably, the same picture. Ure argues that the picture was not only

inadequate technically but intended to show the factory system in a bad light. Interestingly the etching is taken from a contemporary work (Huggett 1976) which depicted vividly the horrors of the nineteenth century factory system. In comparison, there is Ure's version of the same place (Plate I/3) where, presumably, the owner is shown amongst his workers so as to emphasize that the factory was not at all that gloomy, dusty, and unbearable environment.

Physical environment is also the conveyor of the theory of practice in the sense that it allows certain behaviors and impedes others. School spaces and furniture are always 'at work', always 'teach' when the students are around, they restrict and encourage activities which are valued and ranked by a concealed theory. By establishing a list of behaviours encouraged and discouraged by school spaces the researcher may arrive at a set of values, motives and justifications with which to outline a theory of practice, or hidden theory. Behavioral modification and the inculcation of values often happen with the help of spaces. This, perhaps the most important, function of the school often appears to be a technicality in the teaching process where KNOWLEDGE is thought to be at stake. The ways of teaching, not to mention the arrangement of spaces and furniture, are methodological questions in theory and as such they are subservient to higher aims. Hidden curriculum and its hidden theory are veiled in methodology, they seem

to be means of practice in achieving the aims of theory.

When the hidden curriculum is examined in buildings, three different spaces may be distinguished in one room: behavioral, physical or perceptual. Conceptual spaces exist simultaneously. A study of how students use schools' spaces and how those spaces affect them would be sociological. In this study I only refer to this space when I am pointing out inconsistencies between theory and practice in the field. The physical or perceptual space, in fact, consists of the parameters of the space. These data (not only bricks but also the designs and descriptions) must be interpreted. By the very fact of interpretation the space becomes conceptual and ceases to be merely perceptual. The interpretation of a space becomes a philosophical problem. The meaning of a word, an object, or a space is not an innate or intrinsic characteristic but it is a relationship, a reference to (a) other concepts (e.g. conceptual analysis) and (b) concrete objects of reality (e.g. industrial archeology). Thus my raw material is referred to conceptual contexts in philosophy, architecture, and educational theory.

The study gives an account of theories and theories concealed architecturally in the schools of England, Germany and America from the early nineteenth century to recent times. The second chapter describes the development and the characteristics of the schools of the Industrial Revolution. The Lancastrian and Bell systems of teaching are discussed

with references to English utilitarianism. It is argued that the key notion of control in schools was restrictive discipline. This discipline is compared to that of factories. Chapter III focusses on the systematic building efforts in Prussian education. The chapter describes the early nineteenth century developments in organizing the military and their effect on education through the development of state bureaucracy. The analysis of German theories of education shows that such progressive ideas as child-centered education, anti-verbalism, many sidedness, and so forth, are rooted in Prussian militarism. Chapter IV gives an overview of a transitory stage of schooling in the Western world in the late nineteenth century. This was the time when both in Europe and America state systems of compulsory education had been established firmly. It is pointed out that theories and theories of practices converged until an almost uniform 'international' education was born. The pivot of this new education and its controlling functions was science which was conceived as being a moral power. Finally Chapters V and VI offer a summary of the twentieth century developments with special regard to the control theories of the American progressives and the open-space movement. It is argued that theories of modern schooling practices have not lost their controlling aspect, but rather that the process of control has become more veiled.

CHAPTER TWO

The Development and Characteristics of the Schools of the Industrial Revolution

The term 'Industrial Revolution' often conjures up the image of a huge steam engine puffing black smoke. Although the association is apt, there was another equally powerful if less spectacular innovation at that time, the revolutionary invention we call public education, and it was to influence as profoundly the further development of Euro-American culture. This chapter describes the birth of this kind of education in the midst of the machine-boom of the early nineteenth century. I will compare factory organization and discipline with elementary schooling practices for the lower classes. It will be argued that utilitarian educational philosophy and factory discipline were coined on a similar pattern of mass productive efforts in the early nineteenth century. The analysis of the philosophy of education and of manufactures together with an inquiry into school and factory building designs will reveal the similarities between the two seemingly different systems.

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and will help to explain the nature of control exercised in the English schools of the period.

1. The Background

The importance of the Industrial Revolution on education has hardly ever been questioned. Scholarly disputes were and are about the nature of the impact. Educational historians tend to be a little vague:

[B]y this time industrial development had reached a stage which made educational changes appear necessary to many decision-makers. The most obvious need was for a better educated labour force... (Gordon-Lawton 1978:5)

Statements like this might be clearer if we knew more about the nature of industrial development, its relationship to manpower and if we could define crisply what was meant by 'better educated labour force'. Nonetheless there are data which seem to support the Gordon-Lawton argument. After the implementation of the 1802 Factory Act (Health and Morals of Apprentices Act), textile manufacturers had to provide a room and a schoolmaster for the children who worked for them. Apprentices had the right to receive some kind of instruction in the three Rs and an hour's religious teaching on Sunday (Gordon-Lawton 1978:6). In real life, factory owners were reluctant to obey the law, so that if educating apprentices was in their best interests, they did not see it

that way. In 1833 there were at least 15 factory schools in Britain, by 1851 there were 120. It is worth remembering, however, that the number of children who attended these schools was only 2.8% of the total number of elementary school pupils (Brown, 1980). Most pupils went to private or voluntary schools. The proportion of children in private schools declined rapidly in the first half of the century: in 1750 an estimated 70% (of 250,000 pupils), in 1833 60% (of 1,200,000) and in 1851 only 30% (of over 2,000,000) of the school population attended private schools (Digby-Searby 1981:5). This implies that by the middle of the century about 67% of the students were going to schools supported and established by voluntary societies. The first society of this kind was established by Dr. Bray in 1698, the famous SPCK (Society for Promoting Christian Knowledge) and it provided free schooling and clothing to its clients. In 1737 another religious organization was founded, the Schools of Piety. Itinerant teachers wandered across Wales teaching the poor the Bible in Welsh. The first grand scale educational society was the Sunday School Union established by Rev. Robert Raikes in 1782, and finally the monopoly of denominational school societies was ended by the establishment of the Royal Lancastrian Society (1808), later to become the British and Foreign School Society (1814). Its biggest counterpart, founded in 1809 by Lancaster's academic rival Dr. Bell, was an organization with the

impressive name of the National Society for Promoting the Education of the Poor in the Principles of the Established Church Throughout England and Wales. Education of the poor was controlled by the committees of the various societies. The term 'education' however is a slight overstatement here since only reading, writing and some elementary counting was taught in these schools. Occasionally the 3Rs melted down to 2Rs, for writing was omitted in most Sunday schools because it was considered frivolous and unnecessary for the working people (Laqueur 1976). Indeed King George III

[U]tterēd these words which posterity will long remember: - IT IS MY WISH THAT EVERY POOR CHILD IN MY KINGDOM MAY BE TAUGHT TO READ THE BIBLE. (Manual... 1837:2).

It may be that royalty, industry and the church tended to encourage the teaching of reading only for the poor. In Plate II/1 a contemporary diagram reveals how education was seen to be of varying importance at different levels of the society. 'Tradesmen and mechanics' were recognized as eligible for some education, while the 'peasantry &c. &c.' were granted a hollow circle. The content of the circle presented for the 'tradesmen and mechanics' etc. can be assessed indirectly:

[T]he impact of the Industrial Revolution was sometimes catastrophic; in Ashtou-~~under~~-Lyne the percentage [of males] signing [marriage registers]

fell from 48% in 1823 to 9 in 1843. (Digby-Searby 1981:5)

Henry Ashworth, a prosperous cotton manufacturer, boasted in 1833 that 98% of his workers could read but at the same time only ~~45%~~ 45% could write (Boyson 1970). The data of a nineteenth century advocate of the factory system - establish the same point. The figures of Ure in Plate II/2 show that significantly more workers could read than write in factories. This is to argue that the significance of schooling in the early nineteenth century England did not lie in the knowledge that schools conveyed. Advocates of schools must have either thought that merely being at school was beneficial for the child, or they knew that something else, less visible than the overt curriculum, was taught.

2. Social Control: Factories and Schools

As the number of industrial and voluntary schools grew so also did the number of years spent in those institutions, from an average of 1-2 years per pupil in c. 1830 to 2-3 years by the mid-century (Laqueur 1976). By that time factories gave preference to children who had attended school because it seemed that schooling assisted factory discipline (Brown 1980). Laqueur (1976) quotes different sources - about what education should be against: 'noise and riot and playing at chuck and cursing and swearing' (p.23);

ignorance, vice and misery', 'Idleness, play, lewdness,' and every other species of wickedness' (p.27); 'insolence' (p.126); and 'drinking' (p.156). Perhaps this remarkable list tells us something of the attitude of the era; education was thought to counteract certain behaviors, basically a matter of restrictive control.

Meanwhile utilitarians in educational philosophy wove a fabric of control, morals and humanity. In Jeremy Bentham's Chrestomathic school the curriculum was built as follows:
1. Introductory stages (3Rs).. 2. Stages where 'natural sciences' were taught.

Bentham planned his Chrestomathic for the middle classes. By utilitarian logic a pupil who knew only the 3Rs was considered disciplined but not cultured, civilized or moralized, because he did not learn formally about culture and morals. He was more akin to the savages of alien continents than to the English gentleman from the other side of the town. James Mill summed it up in fewer words:

[It is] education wholly which constitutes the remarkable difference between the Turk and the Englishman... (Mill [1818] in Cavenagh 1979:12)

Policing functions, and anthropological interests were mingled at last in Lancaster's plans, who, though disclaiming any personal acquaintance with the Indians, urged his system as the solution to the 'Indian problem' in the States (Reigart [1916] 1969). The nature of the solution, let them be Indians or Londoners, was explicitly put forward by Bentham.

If, in point of real importance, the education of the rich can bear any comparison with that of the poor, it can only be in respect of the influence which the conduct of the former class has over the latter. In the situation proposed, the conduct of the poor will depend - not upon the remote and casual influence of the rich in the way of casual communication, but upon the direct and constant exercise of plastic power. The influence of the schoolmaster on the conduct of the pupil in ordinary life is as nothing, compared with the influence exercised by the Company over these its wards. (Bentham [1816] in Bowring 1843:395)

Thought to be unaware of morality, the pauper was judged to have no free will and thus bound of necessity to obey those who were cultured, civilized and moral. Teaching the 3Rs, sometimes only the 2Rs to the poor meant that they were kept in eternal childhood.

Control had much more overt expressions. Daniel Webster, on the American continent, said in 1820 that education is not a luxury but:

"[A] wise and liberal system of police, by which property, and life, and the peace of society are

secured." (Cited by Nasaw 1979:52)

Baines in 1846 suggested that:

"A system of state education is a vast intellectual police force set to watch over the young ... to prevent the intrusion of dangerous thoughts and turn their minds into safe channels." (Cited by Eggleston 1977:32)

State education, however, meant for the utilitarian philosopher a system of compulsory education or private schooling but not state-run institutions. John Stuart Mill wrote:

If the government would make up its mind to require for every child a good education, it might save itself the trouble of providing one. It might leave to parents to obtain the education where and how they pleased ... That the whole or any large part of the education of the people should be in state hands, I go as far as any one in deprecating. (Mill [1859] 1947:107-8)

Employers in England thought more and more that schooling assisted discipline on the shop-floor (Brown 1980). But what was there about the Industrial Revolution which could bring about such an attitude?

The period from the Renaissance to the mid-nineteenth century was, according to Mumford, the shift from the 'tool-epoch' to the 'machine-era' where "in general, machine emphasizes specialization of function, whereas the tool indicates flexibility" (Mumford 1934:11). The individual

nature of guild manufacture gave way to machines which could produce series of identical, good quality products. Whereas until the Industrial Revolution complicated machines and automats (e.g. clocks) were built mostly for fun, at the end of the eighteenth century machines began to be used for production as well. Automats, like those of Vaucanson, were still very popular, but they were pieces of art rather than industry. They were disguised usually in the shape of a man (or woman, like the clockwork Venus, see: Mumford 1934) or an animal, like Vaucanson's duck that ate, drank and even excreted. Ure ([1835] 1967) enumerates a whole list of fabulous machineries but they differ substantially from factory machines in size, function, source of power and relation to their user. They give the impression of life, of independence of will, while going through their jerky repetitive routines. What the spring was to the clockwork of these delightful robots, the steam engine was to the factory machinery. Steam engines were expensive and so was their fuel when compared to traditional energy sources like wind or water, but their advantage was that they were not dependent on the changes of weather or water flow and when built sufficiently large they were able to supply energy at a steady, even rate. Great size became the symbol of effectiveness because steam engines were much more effective in large units. One big engine could run several machines and, moreover, in many cases a factory would have two

engines, one running at full speed, the other at a much lower speed to prevent the damaging interference caused by the use of single, low-revving steam engines (Ure [1835] 1967). Hence the factory was not a simple proliferation of individual machines and workers. The idyllic picture of cottage manufacture with highly skilled artisans (Plate II/3) had diminished, and the mood was futuristic:

[H]ow vastly productive human industry would become, when no longer proportioned in its results to muscular effort, which is by its nature fitful and capricious... (Ure [1835] 1967:15).

Engines set the pace for the workers. The system may be studied in Plate II/4 which shows the sections of a Strutt cotton mill at Belper, Derbyshire. The power shafts are marked yellow. Uniform and standardized units were driven by belts through a sophisticated transmission system (see also: Plates II/5,6). Even the different mills looked alike because the machine manufacturers in Manchester very nearly monopolized the market.

The effects of this new system on workers was enormous. Artisans had been able to work at home on their own machines in a relatively free time schedule without overlookers harrassing them. It was usual to have 'Saint Monday' or even 'Saint Tuesday' if they had had a long visit to the ale-houses on Sunday. On the other days of the week they worked very hard, 16 hours a day or more (Thompson 1967).

The problem is clearly identified by a contemporary:

The main difficulty did not, to my apprehension, lie so much in the invention of a proper, self-acting mechanism ... as in the distribution of the different members of the apparatus into one cooperative body, in impelling each organ with its appropriate delicacy and speed, and above all, in training the human beings to renounce their desultory habits of work, and to identify themselves with the unvarying regularity of the complex automaton. (Ure [1835] 1967:15)

One can see in such passages the imposition of analytical thinking on production: a breakdown of process into 'rational', manageable and mechanizable units. With this new kind of thinking the sense of fun seems to disappear and the machines in the factories lose the kind of animism that the automata had. In fact the approach is just the opposite; the machine is no longer intended to imitate humans or living organisms but the workers are expected to accommodate to the machine. Obviously machine-workers were paced by the most accurate machine of that time, the clock. And machine-managers found themselves enforcing planning and calculated foresight in order to gain maximum efficiency and profit. Irregular labour was replaced by fixed working hours.

Those who are employed experience a distinction between their employer's and their own time. And the employer must use the time of his labour, and see it is not wasted: not the task but the value of time when reduced to money is dominant. Time is currency:

it is not passed but spent. (Thompson 1967:61)

All this resulted in controversy. It was contended that there was a 'physicomechanical science' which

[Lends] itself to the rich capitalists as an instrument for harassing the poor, and of exacting from the operative an accelerated work. (Ure [1835] 1967:7)

Ure, a defendant of the factory system, answers the charge:

[I]n the factory, every member of the loom is so adjusted, that the driving force leaves the attendant nearly nothing at all to do, certainly no muscular fatigue to sustain, while it procures for him good, unfailing wages, besides a healthy workshop gratis... (Ure [1835] 1967:7)

The picture on Plate II/6 tempts the researcher to view factories as much more bearable places than the anti-factory humanitarians claimed (Vide: Hugett 1973). A more profound examination of the etching compared with the dimensions Ure gave, shows that the space on the picture has been distorted with the result that it looks more spacious.. The line of the floor on the left does not converge to the vanishing point. The result is an image of a higher ceiling. According to Ure the interior of this particular factory building measured 300' x 50' x 12'. But the width of the space cannot be 50 feet as the picture was constructed and the height is more than 12 feet as well unless the gentleman

standing slightly on the left was a dwarf. Distortions of this kind were quite frequent as Ure unveils in another example in his book. This deception is important because we are interested in how the factories were perceived by contemporary thinkers. To them it seemed that productivity and efficiency were reconciled with utilitarian humanity. Perhaps no one has summarized the features of the factory system better than Ure:

The term Factory, in technology, designates the combined operation of many orders of work-people, adult and young, in tending with assiduous skill a system of productive machines continuously impelled by a central power. ... I conceive that this title, in its strictest sense, involves the idea of a vast automaton, composed of various mechanical and intellectual organs, acting in uninterrupted concert for the production of a common object, all of them being subordinated to a self-regulated moving force. If the marshalling of human beings in systematic order for the execution of any technical enterprise were allowed to constitute a factory, this term might embrace every department of civil and military engineering; a latitude of application quite inadmissible. (Ure [1835] 1967:13-4)

Since factories were looked upon as being moral as well as productive institutions the conceptual framework of mass production combined notions of factory efficiency and morality.

The neglect of moral discipline may be readily detected in any establishment by a practiced eye, in the disorder of the general system, the irregularities of individual machines, the waste of time and material from the broken and pieced yarns.

(Ure [1835] 1967:417)

3. The Factory System at Work in Schools

The principles for productive and educational systems came to be almost one and the same; factories came to be hardly less concerned with morality than schools, and the latter were striving for higher efficiency as well as the former. Being disciplined at work was also conceived as a moral obligation toward the employer. Also children were seen as being virtuous if they behaved well. The comparisons made by numerous nineteenth century authors between schools and factories were not empty metaphors. When Coleridge called the schools 'vast moral steam engines' (Cited by Itzkin 1978) he expressed the feeling of the age. Obsession with steam-power is evident in Plate II/8 which purports to show a "birching machine" at work, an example of thinking in terms of steam power. References to steam engines in educational theories were numerous. Bell, the inventor of the Madras school, described his school system as "Like the steam engine or spinning machinery, it diminishes labour and multiplies work." (Cited by Itzkin 1978) Governor De Witt Clinton in New York (1818) drew a comparison between Lancastrian schools and labour-saving machineries (Reigart [1916] 1969). V. Cousin in 1838, after he had visited a Lancastrian school remarked approvingly.

that

"The children went through their evolutions, according to a signal given by a child, as the different parts of machinery in a factory are set in motion by a crank." (Cited by Reigart [1916] 1969:76)

Perhaps what matters here is the analogy with power distribution. Power was transmitted from steam engine to individual but uniform machines as effectively as moral power was distributed through the transmissions of the monitorial system. Foucault comes to a similar conclusion.

The school became a machine for learning, in which each pupil, each level and each moment, if correctly combined, were permanently utilized in the general process of teaching. (Foucault [1975] 1977:165)

Comparisons were not only made between schools and factories but also among them and military organizations. Reigart quotes S. Smith who called the Lancastrian schools "perfect machines" with an "air of military arrangement" (Reigart [1916] 1969:75). It is very important to understand what kind of military they were talking about. As will be argued in the next chapter, military organization and army discipline went through fundamental changes in the nineteenth century. Mumford suggests that:

16th century military drill was the prelude to eighteenth century industrialism. ... The mechanization of men is a first step toward the

mechanization of things. (Mumford 1934:Plate III, legend)

Foucault follows a similar thread by establishing a comparison between the army of Frederick II of Prussia in the mid-eighteenth century and the form of mutual or monitorial instruction in schools of the 1820s (Foucault [1975] 1977). The pre-mid-nineteenth century armies were trained to march and parade in synchronized fashion wearing picturesque uniforms and bearing weapons. Lancaster explains:

[C]hildren in a school room without passages between the desks and around the room, ... are like soldiers without a parade, unable to perform any evolutions of order. (Lancaster 1809:17-8)

Later this system was superseded by training recruits in shooting and manoeuvring rather than in parades. Hence when we talk about 'military discipline' in English schools we must keep in mind that it implied an industrial order, something different from the modern meaning of the phrase.

Laqueur's analysis seems to go to the heart of the matter:

Perhaps the Napoleonic wars inspired the military language in which they are couched: superintendents are colonels, inspectors are majors, teachers are captains, monitors are sergeants, and the best students in each class are the corporals. The set of rules from which this is drawn resembles nothing so much as Ambrose Crowley's regulations for the operation and management of his iron works.* (Laqueur 1976:219-20)

Comparisons between army and school often had factory discipline in mind. Factory discipline, however, was related to the order of pre-industrial armies rather than to that of the modern military of the nineteenth century (more of this in Chapter III).

4. The Justification of Control

Philosophers of the early nineteenth century sought for a kind of justification for social control which would not interfere with their 'laissez faire' ideology. Moral justification of the new form of control involved the utilitarian 'greatest happiness principle'.

The end of Education is to render the individual, as much as possible, an instrument of happiness, first to himself, and next to other beings. [These instruments] are either physical or moral; meaning by physical, those of a material nature, which operate more immediately upon the material part of the frame, by moral, those of a mental nature, which operate more immediately upon the mental part of the frame. (Mill [1818] in Cavenagh 1979:1-3)

In his introduction to volume 8 of the Works of Jeremy Bentham, S. Smith suggested that

There is a growing conviction that the communication of knowledge of this kind to the working classes

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\* In 1770 Crowley introduced regular work hours, time sheets and strict monitorial supervision in his iron mills (Thompson 1967).

would make them better and happier men... (S. Smith 1843:iii)

There has been debate over Bentham's opinion about education and happiness. Itzkin (1978) suggested that there is no sign of any deep concern with individual happiness in Bentham's works. Taylor (1982) argues that Bentham linked the 'greatest happiness principle' with associationist psychology. In fact, control and guidance towards the 'right' was bound up with happiness in the mind of a utilitarian like Bentham. The basic question about the famous Panopticon, Bentham's design for a revolutionary penitentiary, was:

Would happiness be most likely to be increased or diminished by this discipline? (Bentham [1787] in Bowring 1843:64)

Early nineteenth century education had to produce people who could answer the utilitarian question:

How to live? - that is the essential question for us. ... In what way to treat the body; in what way to treat the mind; in what way to manage our affairs; in what way to bring up a family; in what way to behave as a citizen; in what way to utilize those sources of happiness which nature supplies - how to use all our faculties to the greatest advantage of ourselves and others - how to live completely? ... To prepare us for complete living is the function which education has to discharge; and the only rational mode of judging of an educational course is, to judge in what degree it discharges such function. (Spencer [1859] 1966:6-7)

Reading and writing in themselves could hardly be the educational answer to these questions. One wonders what, when and where could the paupers read after 16 hours of work? Mill, Spencer and Bentham obviously knew about the conditions of the working classes so that they could not have had far reaching expectations. Their optimism about the power of education was based on the controlling functions of schools, that they would teach children to accept social order so that the young would behave as citizens should behave in a modern industrial society. These skills of social life were not taught by the teaching of the 3Rs. Values about society were conveyed by the hidden curriculum of 'industrial' schools.

Control in the nineteenth century industrial areas in England rested to some extent on family ties. (In cotton mills, power loom factories the overseers or foremen employed the lower rank workers. The owner of the factory seldom became involved with petty disciplinary questions. Child and woman labour was common, so common that there was often a real family relationship between a skilled male foreman and his unskilled child or female workers (Ure [1835] 1967). Children found themselves exposed to parental authority and the discipline of factory management at once. If schools helped control children and even reinforce factory discipline we may venture to say that a father working in a factory as a foreman or a skilled worker came

to want his child schooled both as a father and as a boss. With this in mind we can see how there grew up a wish for cooperation between parents and teachers:

Teachers are recommended to maintain a constant communication with parents, respecting the habits and principles of the scholars; by which means they may greatly improve that influence of parental authority, and, also, strengthen both that authority, and their own, as their pupils will thus perceive that there is a cordial cooperation between their natural guardians at home, and the authorities they are taught to respect in school... (Manual... 1837:10)

Opposed to this apparently authoritarian control there was a balancing ideology based on religious piety and Lockean psychology. The 'tabula rasa' theory seemed to support the argument that children are innocent by nature. Perhaps as a consequence of this, there was discussion concerning the nature of the innocence of the child. German philosophers claimed that a child cannot be either good or bad since he does not have moral awareness. Popular stories written in nineteenth century England were substantially different from their German counterparts (see Chapter III). Instead of the German omnipotent father figure, English favoured tales about fathers of 'depraved habits' whose daughters were given a Bible at school. The children read the holy book at home aloud whereupon, needless to say, the fathers gave up their bad habits and consequently praised their children. Laqueur quotes several similar stories. A man was reported

to have stood up and told the members of a Wesleyan congregation:

"My son, who now sits beside me is my spiritual father. He heard me cursing, while in the state of drunkenness, and said to me, 'Oh father, my teacher said today at Sunday school that neither drunkards nor swearers could ever enter heaven.'" (Cited by Laqueur 1976:15)

#### 5. Organization for Control: Monitors and Efficiency

The monitorial system which was planned to be a model for self-government utilized the same principle. From time to time children were made into leaders, both in order to give them a taste of power over others, and to teach them the necessity of restraint.

"The system of Mutual Instruction ... by alternately placing him in the position of teacher and of taught, of superiority and inferiority, naturally enforces the exercise of the qualities demanded by each, on one side the duties of humility and obedience and on the other, the mildness, and impartiality, which ought always to be inseparable from the exercise of power." (Wyse cited by Reigart [1916] 1969:75)

The New York Free School Society's 19th Annual Report in 1824 put it this way:

"The boys who prove themselves worthy, are chosen to fill places of trust and authority over other boys; so that it may be safely affirmed that a boy educated agreeably to this system, cannot fail to be made

practically acquainted with the elementary principles of civil government and thereby preeminently qualified to become a good citizen." (Cited by Reigart [1916] 1969:84)

The monitorial system seems to have been the invention of either Joseph Lancaster or Dr. Andrew Bell. Bell wrote about it first, calling it the 'Madras system' because he had seen and used the method in India. Lancaster developed a similar system of his own. In fact there were antecedents to the monitorial system in the seventeenth century, the Jesuits employed monitors in their schools, and derived their methods from those of the armies of ancient Rome. Thus the 'decuriae' or 'decurions' were based on Roman spirit and were far from the mass productive efforts of the nineteenth century English 'schools' (Foucault [1975] 1977) (Plate II/9). In both Lancaster's schools and Strutt's factories, firm order was maintained by a hierarchically organized system: in industry the overseers, in schools the monitors. They were, 'symbolically speaking, the 'camshafts', the 'transmission system' of the central authority or power. The relationship between teacher, monitor and children was appropriate to legal government.

The master, to a certain degree, delegates his power to inferior agents, who report to him, and from whose decisions the children may appeal to himself. (Manual... 1835:47)

According to the 1820 Manual of the British and Foreign



School Society the rank of monitors should consist of the following:

I. General monitors

1. General monitors of order
2. Monitor general of reading
3. Monitor general of arithmetic
4. Monitor general of writing

II. Subordinate monitors

1. Monitors of classes
2. Assistant monitors
3. Monitors of reading
4. Draught monitors
5. Monitors of arithmetic
6. Monitors of writing

(Reigart [1916] 1969:32) The 1837 English edition shows a significant reduction in the number of subordinate monitors. There were only three in kind: monitors of classes, of drafts and of inspection (Manual... 1837). Within the group of monitors there was a sequence of rank. The higher rank monitors selected the subordinate monitors. The duties of the general monitors of different subjects all began with: "1st - To obey the general monitor of order" (Manual... 1837). Subordinate monitors not only had to obey

the general monitors; they were also appointed by them. The New York Manual of the Society in 1850 tells of a slightly different structure.

I. Monitors of instruction

1. Monitor general of reading
2. Monitor general of dictation
3. Monitor general of arithmetic
4. Monitor general of writing
5. Draft monitors of reading and ciphering

II. Monitors of mechanical operations of the school

1. Book monitors
2. Street and yard monitors
3. Monitors of ventilation
4. Fuel and fire monitors

(Reigart [1916] 1969:33) The appointment of child officials was a tradition in English schools. The description of the Eton customs in 1560 mentions several 'praepositi' chosen from among the boys to supervise the others (Seaborne 1971). It was, however, the Lancastrian monitorial system that conquered the world, so to speak. The method was used in India, in Europe, even Berlin had monitorial schools (Foucault [1975] 1977). The idea was introduced into Australia in 1820 in New South Wales (Burchell 1981), and into America in 1806 by the Public School Society (Reigart [1916] 1969).

The monitorial system in the Lancastrian school can be grasped by studying Plates II/10,11. Efficiency was secured by instructing 300 or more students in one room. Monitors

stood at the ends of rows of seats or walked between the rows inspecting the works of students (Plate II/11). The general monitor of order stood on a high chair to overlook the operation of the school (Plate II/10) or stood in front of the desks (Plate II/11, the boy standing in the middle). The teacher governed the performances of the school-machine from the wings (the man on the right on both Plates II/10 and 11). Plate II/12 shows the monitors at work distributing books, inspecting slates and correcting the written work of the pupils.

Pupils were seated at their desks and orders were given mostly by whistles, bells and telegraphs. These latter are clearly shown on Plate II/10 on the left end of the bench-rows (indicated by number 8). They show a number of the class or the letters EX, i.e. 'examined', so that the general monitor of order can tell if subordinate monitors have finished correcting the works of their pupils. From Foucault ([1975] 1977) we learn that the number of commands given to the children were over 200 a day. In the morning period alone 26 orders were given by voice, 23 by signs, 37 by rings of bell and 24 by whistle. Midwinter (1970) reports that in the Chrestomatic school in Birmingham the bell rang 250 times a week, 41.6 times a day on average. Apparently the elaborate system of commands were uniform for every school. The Manual... (1837) contains a 'Vocabulary of Commands'. Uniformity in organization was important in

the Lancastrian system. Even the Masters, who seemed to be omnipotent, were subject to uniformization and hence interchangeability.

[A]s long as the system of the MODEL SCHOOL is adhered to, it is easy to find a successor who shall at least be competent at once to enter upon his duties, without disturbing the regular order of school. (Manual... 1837:vii)

(In cotton mills, workers were penalized if they could not provide substitute hands while they were ill.) Above this local organization was the appropriate voluntary society and its committee in London.

The advantages of uniformity are obvious and important. It enables the COMMITTEE to apply at all times a sure criterion by which to judge of a Teacher's capacity and diligence. (Manual... 1837:vi)

The facade of the central model school of the British and Foreign School Society symbolizes the power relations: in the centre there was the highest block, marked as the 'Society' and on both sides were the schools, one for boys and the other for girls (Plate II/13).

The linear hierarchy of the organization and the system of rewards and punishments were similar in schools and factories. Bentham's general formula of 'separate-work principle' or 'performance-distinguishing principle' was vital to mass production.

1. Where tasks can be separated, avoid gang-work.  
 2. Where gang-work is inevitable, the smaller the gang the better. 1. Because the fewer the workmen whose work thus is blended, the easier each man's share in the work may be distinguished. 2. Because, if a reward be given to the gang, the smaller the gang, the larger the share which each man's own exertion procures for him. (Bentham [1797] in Bowring 1843:384)

In philosophical terms the principle was based on both experience oriented psychology and analytical thinking.

It shews the analogy between the analysing of a complex sound, namely, a word, into the simple sounds of which it is composed, to wit, letters; and the analysing of a complex feeling, such as the idea of a rose, into the simple feelings of sight, of touch, of taste, of smell, of which the complex idea of feeling is made up. (Mill [1818] in Cavenagh 1979:11)

In the schools this principle was put to work at the draft stations where 10-13 pupils stood in a semicircle facing the wall and the demonstration table (Plate II/14). Efficiency was encouraged, idleness discouraged. In a reading lesson the monitor would conduct his 'orchestra' like this:

[S]uppose the word to be cheerfulness, the first boy would say c,h,e,e,r - cheer, the second f,u,l - ful, the third n,e,s,s - ness, and the fourth would say cheerfulness. (Manual... 1837:21)

Semicircles were planned to (1) produce a higher degree of specialization; and (2) provide the possibility of competition among the pupils. Bentham's 'place-capturing principle' explains the procedure.

[H]e whose place is at one end of the line is considered (no matter on what account) as occupying, at the time, the post of greatest honour; the one whose place is next to his, the post next in honour; and so on. The highest scholar, as above, begins to say the lesson: in case of an error, the next highest, on giving indication of it, takes, in pursuance of an instantenous adjudication, the first place, which the sayer of the lesson is, in punishment for such his deliquency, adjudged to lose: failing the next, the next but one; and so on to the lowest. (Bentham [1816] in Bowring 1843:48)

Obviously promotions were flexible in this system. The table below, quoted by Reigart ([1916] 1969) lists the promotions made in the year of 1847 in the Lancastrian schools of the Public School Society, New York.

Children promoted:

3878 from the 1st to the 2nd class  
 3423 from the 2nd to the 3rd class  
 3748 from the 3rd to the 4th class  
 3286 from the 4th to the 5th class  
 2000 from the 5th to the 6th class  
 2427 from the 6th to the 7th class  
 1808 from the 7th to the 8th class  
 1123 from the 8th to the 9th class  
 3230 to writing on paper  
 3906 to addition and subtraction  
 3024 to multiplication and division  
 1934 to compound of first four rules  
 1216 to reduction  
 1996 to proportion  
 1516 to practice  
 1588 to interest

What is interesting in these figures is the high number of promotional levels. It was needed because the organizational machinery linked promotion and demotion to punishment and reward. Money became a measure of position:

All means of acting upon a man's interest, reducible to the two heads of punishment and reward. - Punishment, commonly so called, is out of the question here, being provided by the general dispensations of law - applications of reward are left mostly free in transactions between individual and individual. But money (including money's worth) is, in point of effect, the matter of reward, or punishment, or of both at once, in so far as it lies in the power of one man to cause it to pass into, or pass out of, the hands of another. (Bentham [1797] in Bowring 1843:380)

The principle was the same for education as well. Mill identified the same energy source:

[T]here are two things which have a wonderful power ... They are, Custom; and Pain and Pleasure. These are the grand instruments or powers, by the use of which the purpose of education are to be attained." (Mill [1818] in Cavenagh 1979:19)

Pain and pleasure, or punishment and reward were connected by associationist psychology. R. L. Edgeworth maintained that pleasure must be associated with what we wish that pupils should, and pain with what we wish they should not, do (Birchenough 1925). Mill claimed that the sequences of ideas, or 'trains' can be either good or bad.

As a train commends in some present sensation, so it may be conceived as terminating in the idea of some future pleasure or pain. (Mill [1818] in Cavenagh 1979:19)

Termination was secured, as Bentham suggested it, by money.

Thus money or the lack of it, reward and punishment,

pleasure and pain were coined into one conceptual framework.

Although Itzkin (1978) assumes that there was no remuneration for monitors, in fact, they were almost always paid. The system of rewards rather than of canings was worked out carefully. We find

[R]eward tickets of nominal value, which are given to monitors, as the price of their labour, and to deserving boys as a reward of their good conduct, and withdrawn whenever it is requisite to punish.  
(Manual... 1837:58-9)

Reigart ([1916] 1969) also reports a complete system of fines and payment in the New York Lancastrian schools. The Monitor General received eight, the other monitors two to four tickets daily. The teacher gave out an additional one thousand tickets per month. The value of tickets varied, in England draft monitors were given a number of tickets worth a farthing, while general monitors were paid regularly, two and a half to four pence a week. In the States, c.1820, the tickets were valued at one eighth of a cent. Given the fact that in England, in the 1830s a 9-10 years old boy could earn in a factory an average clear wage of about two shillings and nine and a three quarter pence (girls could make even more - Ure [1835] 1969) these rewards were not irresistible. One can imagine how their importance increased when children were forced out of the labour market and deprived of any income following the implementation of



the 1832 Factory Act. Tickets were given and taken away in much the same way as mill workers' forfeits were deducted from the 'gift money' for which they were eligible. To take back something that has already been given or counted on proved to be sufficient as a means of control. Rewards were given to pupils who were obedient and did their work well. Sometimes a 'Class of Merit' was formulated, a little society in the school with its own chairman, secretary, register, and treasurer, which held regular monthly meetings. The members of this class wore a medal around their necks with the words: 'Class of Merit' (Reigart [1916] 1969).

Punishments other than the withdrawing of tickets were inflicted on children regularly, for as often as not, common offenders did not have any tickets to be withdrawn anyway. Lancaster had strong feelings against physical punishment: caning, birching and so forth. In his schools pupils instead of being corrected by the rod:

[W]ere labelled with badges of disgrace, shackled, suspended in a sack or basket tied to desks or posts; while the incorrigible were sometimes tied up in a blanket and left to sleep at night on the floor in the school-house. (Reigart [1916] 1969:10)

Old offenders were sometimes yoked together by a piece of wood fastened around the neck. According to Lancaster "Four to six can be yoked together in this way" (Cited by Reigart

[1916] 1969). For having a dirty face, a girl was called to wash the boy's face in public with 'gentle tapping' - and we are told that there were no dirty faces for two years in the school after this incident. Boys wandering from their seat were placed under a hen-coop, idle boys were rocked in a cradle etc. Tickets were withdrawn for talking (4); disobedience (8); truancy (20); fighting (50) (Based on the 1820 Manual of the British and Foreign Society - Cited by Reigart [1916] 1969).

The forfeits workers had to pay in the Strutts' mills in the year between 1805 and 1813 were classified by Fitton and Wadsworth (1958) according to the offences: 1. Absence without leave 2. Theft of mill property 3. Destruction or damage of mill property 4. Failure to work as required. Absence or truancy was heavily punished both in factories and schools. Destruction of school properties (marring desks, writing obscenities on the fences or walls of privies) was punished as well. Only stealing is missing from the list of common offences in schools, probably because there was little of value for the children to steal. The 5th group of offences was 'Failure to comply with mill discipline' and it meant "Idleness and looking thro' windows"; "calling thro window to some soldiers"; "making a noise when order'd not"; "using ill language"; "talking &c.". Other misbehaviors like "riding on each other's back" or "terrifying S. Pearson with her ugly face" may further

confuse the researcher about the nature of that ominous code of proper behavior in factories. The records distinguish the general sin of "telling lies" from the worse sin of "telling lies to Mr. Jedediah". Some misconducts were committed outside working hours. The workers of the mill were fined "for putting Josh Haynes' dog into a bucket of hot water" or for "rubbing their faces with blood and going about the town to frighten people". (All examples are taken from Fitton-Wadsworth 1958 but Boyson 1970 reports similar cases in the Ashworth mills). This persuasive list supports the argument that factories were no less involved in 'educating' or 'correcting' children or the poor than the schools.

Paying the monitors, allowing them to direct others, move around and even to sit by the master gave them privileges which had symbolic but no practical value. These bound children (monitors or, in factories, foremen) to their superiors and although they had some power over others they were still pupils/workers. Control was maintained by privileges that could be taken away.

[C]hildren ... feel a sense of responsibility, and of the comparative importance assigned to them, quite sufficient to make them anxious to discharge their parts well, and readily to adopt the recommendations, and follow the injunctions given by the head master. He can, also, suspend, remove, or change his monitors, as he may think proper... (Manual... 1837:13)

## 6. The Space for Control: A Comparison of Spaces in Schools and Factories

Schools and factories shared similar organizational structures and similar spaces. Architectural space and discipline are inextricably connected in social institutions. Foucault ([1975] 1977) argues that discipline is indicated by the distribution of individuals in space. Aspects of this distribution are (1) enclosure (the monastic type: barracks, factories and schools fenced around by gates and guards); (2) partitioning (one person for one place); (3) functional sites (zones within the space); and (4) transformation of arrangements ("Discipline is an art of rank" - see Foucault [1975] 1977:141-6). In factories discipline was maintained partly by the central power source (the machines were started and stopped together) and partly by breaking down the workflow into small fractions, assigning one machine or worker to each fraction. This resulted in enclosure of the factory as a total unit and partitioning of the spaces within the whole. Thus it came about that leaving the workplace and going to windows became sins. Plate II/4,5,6 show that the length of the factory building was determined by the longest possible shaft length and the width by the largest possible number of belts running in parallel. Because the machines were alike in a functional site, parts and workers to some extent became

interchangeable, the loss or breakdown of one or the other did not effect the work of the whole. This organization of production demanded big, homogenous spaces. The working space was usually an oblong, with windows on the longer sides. Within the building space tended to be equally distributed among similar machines.

Lancastrian school spaces had a similar pattern to them (Plates II/10,11). Schools were not built in conscious imitation of factories; it was rather that similarities in the discipline of production and the discipline of education resulted in similar spatial arrangements. While nineteenth century architects clearly saw the resemblances, they often attempted to disguise the functional overlaps. Henry Kendall, for example, the British architect, suggested in 1847 that:

If schools look like factories children will not see that education has any more value than ribbon-making. Therefore the school should be 'the prettiest building in the village, next to the church' and even though cheaper materials like deal instead of oak be used, 'nothing [in it] need be ugly'. (Burchell 1980:13)

Beneath such aesthetic justifications I surmise that efficiency in education was the underlying motive in designing pretty schools. Bentham, deeply interested in Lancaster's works, wrote warmly on the subject of efficiency:

[V]arious sources of expense which, on the existing plans are necessarily multiplied, are by this plan reduced to one: - one building, one general superintendent, constantly on the spot; one apparatus for warming, the same for lighting; one set of implements employed as instruments of instruction. (Bentham [1816] in Bowring 1843:14)

Lancaster planned his school for 320 children but explained that it was even more efficient than appeared at first sight:

[M]any are absent from school by reason of sickness, or from the poverty of parents for other necessities, a school-room which will seat three hundred and twenty boys, will accomodate, at least, three hundred and fifty. (Lancaster 1809:14)

In this way

[W]hile the progress of the pupils in learning was much more rapid on this, than the old method, the annual expense for each child need not, in a large school, exceed five, or six shillings. (Manual... 1837:1)

The building itself was supposed to be isolated from the environment to the highest possible degree. "[I]t is not desirable for the school to be liable to be overlooked by rude boys in the public street" (Lancaster 1809:16). One cannot help wondering about the boys outside (rude, crude raw material) and the others inside (refined, manufactured, educated). A simple but certainly successful method for labelling kinds of people. Objects of the world were

treated accordingly.

By height, or otherwise so order the windows, that, so far as such exclusion can be made consistent with the admission of a sufficiency of light, no object, exterior to the building, shall be visible in any part of it occupied by the scholars. (Bentham [1816] in Bowring 1843:52)

Moreover, in his Chrestomatia he thoughtfully warns the schoolbuilder.

Whatever part of the interior of the building is exposed to the view of the Scholars, keep it covered with the matter of instruction... (Bentham [1816] in Bowring 1843:52)

Windows in Lancastrian schools were located at least six feet high from the ground or were in the roof (Plates II/10,11) so that children could not be disturbed by the outside world, but this rule was sometimes ignored (Plate II/15).

In the first schools of this kind, Lancaster designed a room for 320, or in the compressed plan, for 280 pupils (Plates II/16,17). Although the plans would "apply in principle equally to a school for a thousand children" (Lancaster 1809:5). Great attention was paid to the shape of the space.

The most eligible form for a school-room is a long square, as it affords to the spectator a commanding view of every child, when the floor is properly

elevated, and the desks suitably arranged.  
(Lancaster 1809:11)

The first plan (Plate II/16) shows a 70 feet long, 32 feet wide room, while the compressed plan (Plate II/17), which was not recommended unless money was scarce, measured 50 feet in length and 32 feet in breadth. Lancaster's intentions in planning the room in the form of a long rectangle were made clear when he recommended avoiding

[The protrusion of any thing which boys can possibly find any opportunity of getting behind, and being out of their master's sight.. (Lancaster 1809:15)]

The master's eye seems to have been another crucial consideration in the planning of schools at this time. The room had to be twice as long as broad otherwise the master would have had to turn his head, losing some pupils from his sight while catching others. The Manual of the British Society describes the desirable schoolroom in great detail.

The form of the room best adapted to the working of the British system, is that of a parallelogram, its proportion varying according to the extent of the area. The centre of the room should be occupied by desks and forms, a clear passage of from six to eight feet being reserved for the reading stations. At the upper end of the room, a raised platform should be erected, surmounted by the master's desk and drawers. The windows should be either in the roof, or elevated at least six feet from the ground; at four and at six feet from the floor, rails should be fixed against the walls, from which the lesson boards may be suspended. The ground space between the desks and the wall, ought to have curved lines traced on it of



nearly a semi-circular form, to mark the station of each reading or spelling draft. (Manual... 1837:17)

Bentham's "Panopticon principle" involved:

Minimizing the distance between the situation of the remotest Scholar and that of the Master's eye; ... giving to the floor or floors that inclination, which, "to a certain degree, prevents remoter objects from being eclipsed by nearer ones; ... enabling the Master to see without being seen, whereby, to those who, at the moment, are unseen by him, it cannot be known that they are in this case. (Bentham [1816] in Bowring 1843:48)

The Panopticon was originally planned by Bentham as a jail (Hume 1973; 1974). The title of the work was: "Panopticon; Or, the Inspection-House: Containing the Idea of a New Principle of Construction Applicable to Any Sort of Establishment, in Which Persons of Any Descriptions Are to Be Kept Under Inspection; and in Particular to Penitentiary-Houses, Prisons, Houses of Industry, Work-Houses, Poor-Houses, Manufactories, Mad-Houses, Lazarettos, Hospitals, and Schools: With a Plan of Management Adapted to the Principle: In a Series of Letters, Written in the Year 1787, From Crecheff in White Russia to a Friend in England." As he saw it the strength of his principle lay in its power to make society more orderly. He saw

- morals reformed, health preserved, industry invigorated, instruction diffused, public burthens

lightened, economy seated as it were upon a rock, the gordian knot of the poor-laws not cut but untied - all by a simple idea in architecture. (Bentham [1791] in Bowring 1843:66)

Plates II/18,19 show two of his plans based upon this principle, one for a penitentiary and the other for a workhouse for the poor. Bentham's key notion differed from that of Lancaster in that he tried to maintain constant supervision by means of a circular arrangement; the inspector, teacher, ward, or doctor was placed in the middle and from there kept an eye on everyone. He designed a voice-tube system linking every cell at the circumference to the inspection tower in the core so that the inspecting persons could hear everything that was happening in the cells without necessarily being seen or heard themselves, yet could talk to the people around them through the tubes if necessary.

The object of that contrivance was, to know what prisoners said without their suspecting any such thing. The object of the inspection principle is directly the reverse: it is to make them not only suspect, but to be assured, that whatever they do is known, even though that should not be the case. Detection is the object of the first: prevention, that of the latter. In the former case the ruling person is a spy; in the latter he is a monitor. (Bentham [1791] in Bowring 1843:66)

Schools favoured the rectangular Lancastrian plan, however, while exploiting the same principle. All desks faced the master's elevation. Double desks or benches

facing the wall were seldom admitted. The reason for doing this was to provide the kind of supervision discussed above. Nasaw's comments are, hence, unfounded when he suspects feudal hierarchy in monitorial schools:

[Lancastrian schoolrooms] were arranged in strictly hierarchical fashion, more appropriate to a feudal kingdom than a New World republic. (Nasaw 1979:20)

Before the Lancastrian schools came into fashion English schools had been furnished optionally with benches, desks or individual seats around the walls leaving a hollow space in the middle for other activities than reading or writing. But according to Lancaster:

Those boys, who sit at desks which face the wall, sit either sideways, or with their back to the master. Half of the boys who sit at double desks, usually sit with their backs to the master. In both cases one side of each boy is out of the master's sight: this is a serious inconvenience, and the cause of much disorder, as the consciousness of being under the master's eye, has a tendency to prevent half the common offences. (Lancaster 1809:13)

It was not only the master but occasionally the Visitors who kept their responsible and fatherly commanding eyes on the scholars. Visitors, where schools were administered by philanthropic societies or by individuals (usually factory owners), were of outstanding importance. The location of doors was designed with Visitors in mind: entrances were contiguous to the master's desk so that

[V]isitors, on entering the school-room, have a full view of the whole school at once: a sight to the benevolent heart, most interesting, and to the eye, one of the most pleasing which can be witnessed. (Lancaster 1809:15)

Visitors representing the government became increasingly influential after 1832 when a £ 20,000 grant was provided for school building programs. On Aug. 30th, 1833 the Treasury ordered that these monies were to be administered only through the National and the British and Foreign Societies (Godfrey-Castle 1953). Both societies used the monitorial system in their schools.

In Plates II/10,14,16 there is only one door. In Plates II/11,17,20,21,22 there are two doors but the second door is used only as an exit. Visitors are depicted in Plates II/10,11 on the left side of the pictures. It is interesting that in Plate II/11 a bannister separates the pupils from the Visitors; the scene reminds one of an exhibition. Visits of this kind were quite frequent as Brown (1980) reports that the Strutt\*\* family in Stockport visited

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 ** The Strutts were typical factory owners of the era. The cotton business was started by Jedediah Strutt in 1758 and after his death in 1797 it was taken over by his three sons.

Under them it became the largest in the country, celebrated not only for its size and for the excellence of its buildings and equipment but for its efforts to ensure the well-being of its workers. (Fitton-Wadsworth 1958:169).

the factory school 78 times in the years between 1881 and 1886. In Plate II/6 a gentleman is depicted in a factory posing very much like a school visitor. It is not stretching the truth to say that he could have been the same person, the owner of the factory and the patron of the school. According to Henry Ashworth's statistics. (Boyson 1970) manufacturers lived in close proximity to their factories: only 29 out of 904 proprietors owning 550 cotton mills in the Lancashire and Cheshire areas did not live in the same town as their mills. Ladies also played a part in these visits, Mrs. and Miss Strutt were present on 44 of the visits (Brown 1980). Non-factory schools were visited by the trustees of different voluntary societies, who were no less diligent: the Public School Society in New York made 11 844 visits to schools in one year (Reigart [1916] 1969).

In the schoolroom children were seated efficiently. The first, and lowest class at the nearest to the master's elevated dais which was 2-3 feet high, while the highest reading class had its place in the back rows. Pupils were made to sit quiet in their desks in straight rows. Plate II/10 represents the educator's ideal. However, in fact, the school looked most likely much more like Plate II/11 where rows and lines are indistinguishable. The intention was to discipline the body:

[D]iscipline produces subjected and practiced bodies,

'docile' bodies. Discipline increases the forces of the body (in economic terms of utility) and diminishes these same forces (in political terms of obedience). (Foucault [1975] 1977:138)

Sitting close to each other in rows of desks certainly maintained a kind of strict order, especially

[W]ith children who are restless, volatile, and unused to restrain mechanical motions of the body ... and no teacher ought to sit satisfied until he has brought every child to sit, stand, speak, or be silent, on the instant of the command being given. (Manual... 1837:10)

Restraint of the body was not conceived only as physical confinement. Perfect control of bodily movements could be part of educating the mind as Mill points out:

Under Physical Head, it investigates the mode in which the qualities of the mind are affected by the health, the aliment, the air, the labour, &c. to which the individual is subject. (Mill [1818] in Cavenagh 1979:3)

As the years went by the children became used to physical restraint and continuous supervision. Plate II/23 shows the regulation positions of children getting in and out the desks. Words of commands directed them and we can see once again the analytical approach: taking a seat, taking off one's hat, each was broken down to specific motions and commands. This spirit pervaded the school. The top figure on Plate II/12 shows a monitor handing out books. The

Manual of the New York society devoted pages to explaining how children should handle books. The positions of the hands, eyes and fingers were all described and fixed. The vocabulary of the words of command created a formal behaviour, a sort of clockwork very like that of the factories where there were set times for starting and stopping work, eating, drinking and 'making water' (three times a day). (Hugett 1973).

Time has played an important role in schooling since sixteenth century and Comenius' schools. Illich puts it glibly:

Children appeared in Europe along with the pocket watch and the Christian money lenders of the Renaissance. (Illich 1972:39)

The clock was symbolically placed behind the desk of the Master, ("A clock should be fixed to the wall behind the master's desk." - Manual... 1837:75) and was one of the items furnished to the Lancastrian school. Plate II/24 shows the interior of a Madras school, a system based on Bell's ideas; the clock occupies a commanding position. A strict time schedule was reinforced by the seating arrangement: a child who was late could not take his place easily, nor leave it easily if he wanted to go to the toilet. Punctuality came to have crucial importance in schools. The 1833 Rules of the Wesleyan Methodist Sunday

Schools describe the beginning of a schoolday.

"The Superintendent shall ring again, - when, on a motion of his hand, the whole school rise at once from their seats; - on a second motion, the Scholars turn; - on a third, slowly and silently move to the place appointed to repeat their lessons, - he then pronounces the word Begin..." (Cited by Thompson 1967:85)

7. Summary

In summary it can be said that in the early nineteenth century monitorial schools represented a new development in education. Lancastrian schools aimed at the education of the poor, the lower if not the lowest classes, on a grand scale hitherto unknown. In this they differed from private schools which enrolled mostly the affluent, or from the church charity schools which had a more limited scope both financially and geographically.

The monitorial system in its thinking and practical appearance was built on the same principles as the factories of the Industrial Revolution. This is not to say that schools were consciously designed to be similar to factories. Lancastrian schools spread to many parts of the world, from the Thames to the Ganges and from Paris to New York. The monitorial system offered a new and successful tactic of control in any situation where discipline of a special kind was required. "The nature of this discipline

was described by Lancaster as: "A place for every thing, and every thing in its place" (Manual... 1837:50). These words became the motto of the Lancastrian schools. One might add: and everything at its proper time, for the clock played an important role in the new discipline. Movements performed in synchronized order were to provide maximum efficiency, to exploit space, moment and machinery. In a sense the desirable characteristics of the worker were determined by the machine he was working on, and in the same way the desirable pupil was the one who made teaching fast and easy, the one who was ignorant, innocent and willing to cooperate with his superiors. The system incorporated rewards and punishments, was formalized by rules and by spatial arrangement, so as to perpetuate itself. Rewards and punishments were justified by utilitarian educators in terms of the 'greatest happiness principle'.^{**}

I argue that the design of both curriculum and school building were part and parcel of this system, and furthered the strict control of bodily motions in response to words of command and to a certain extent furthered a corresponding control of thinking. This discipline was maintained by (1) teaching subjects which need spatial confinement (reading, writing, counting) and (2) breaking down the complex motions of students or workers into analytical fragments so that efficient teaching or production could take place.

^{**} See note on Bentham's Principle of Utility in Appendix, p.301.

CHAPTER THREE

The Early Nineteenth Century Prussian Military Organization and Schooling

While the Industrial Revolution had brought earth-shattering changes into the ways societies were organized, at the same time a less conspicuous but equally important revolution took place on the Continent: the rise of modern state bureaucracy in Prussia. The evolution of administrative systems had a twofold impact on our subject: first it constructed the pattern of bureaucracy that still prevails in the practice of modern state administration, and, second, it was strongly tied to the emergence of modern compulsory education as a uniform, upgrading national schooling system. The Prussian attempt to establish mass education was different from that of the English. While, as it has been argued in Chapter II, the British system of schooling was based on efficiency and mass production in an attempt to better society, the Prussian model simply and 'democratically' extended state supervision

to her citizens. Because they possess what Hegel calls "the right of compulsory education" (Cited by Luqueer [1896] 1967:146), all the subjects of the crown are compelled to go to school and made to believe that this is for their own and for the society's good.

In this chapter it will be argued that the organizational changes of the early nineteenth century Prussian military and state administration were generated by the very same ideology as the then contemporary philosophies in education and school design. Despite the eventful history of one hundred years from the end of the eighteenth to the last decades of the nineteenth century, the aims and methods of government control and of primary education seemed to have remained the same from the reign of Frederick the Great almost to the end of the last century (Gillis 1971; Rosenberg [1958] 1966; Veblen [1915] 1954).

1. The Evolution of Bureaucracy and the Military

School administration was part of state bureaucracy and its structure and functioning was patterned upon the financial and military departments of government (Becker in Otto [1963] 1966:11). This is why I shall now describe characteristics of modern bureaucracy, and give a short account of the nineteenth century Prussian administrative system.

Among the novelties of the Prussian system we find three tendencies important:

(1) There was a centralization of power accompanied by a decentralization of administration (Hazen 1872; Shanahan [1945] 1966).

(2) There was a tripartite system of state control consisting of territorial, functional and departmental units (4, later 5 ministries).

(3) There was a tendency for a new and growing part of society, the bureaucracy, to become more and more independent of royalty and royal restrictions (Anderson 1981; Gillis 1971; Kehr [1965] 1977; Rosenberg [1958] 1966; Veblen [1915] 1954). The pivot of modern bureaucracy is a dual system of power and administration invented by the Prussians. General Hazen, an American visitor to Prussia in 1870, said:

[W]ith a centralized power and a decentralized administration, wonderful results are accomplished. (Hazen 1872:169)

Now Prussia and her German allies have been described by some as being 'militarist' in their main characteristics (Hazen 1872; Kehr [1965] 1977; Veblen [1915] 1954). Being a military state in the nineteenth century meant something substantially different than what it means today. Now the term makes us think of South and Latin American juntas. But in those days the development of state bureaucracy and

militarization went hand in hand, they were seen as part and parcel of nationalism, as an inevitable response to the threats of Napoleon. Before 1808 military affairs were scattered among several different civil offices. Baron vom Stein suggested adding a fifth department to the existing four established by Frederick the Great. The Ministry of War was created with two departments, the "Allgemeine Kriegs Department" (General War Dept.) and the "Militär Ökonomie Department" (Military Economics Dept.). Thus organization and command were separated entirely from administration and supply (Shanahan [1945] 1966). In the 1860s Hazen distinguished the men of power from the administrators:

The German staff and administration are the models of efficiency and economy. The former contains one hundred and fifteen officers, headed by General Moltke, and is composed of the very best men of the army ... The officers are purely soldiers, and have nothing to do with administration, except in the highest military sense as chiefs of staff. The administration, which pays, feeds, clothes, and supplies the army is made up of men who have risen from the ranks, and shown special fitness for that mercantile style of work. (Hazen 1872:226)

Hazen contrasts this kind of organization with that of the American army in which the best men were removed from the fighting units to higher ranks where they were overburdened by administrative tasks and could scarcely utilize their superior military knowledge and skills. It seems that the Prussian military organization was the first truly staff-and-line administration.

The high staff commanded the different branches of the army (infantry, cavalry, artillery, engineers) while the administration (first the "War Commissariat", later the "Subsistence and Pay Departments") embraced the army as a whole. At the same time the army was organized on territorial principles as well. The standing army of the North German Confederation in the 1860s consisted of twelve army corps, the Guard Corps and the Hessian Division.

Every army corps consists of infantry, cavalry, artillery, jagers or sharpshooters, engineers, and the military train. (Haŕzen 1872:395)

The army corps were broken down into 24 divisions plus 3 further divisions of Guards. There were two infantry brigades per division so the entire army's infantry consisted of 48 Brigades of Foot, these were subdivided into 109 Regiments and those into 342 Battalions. Although it seems that the Prussian army was broken down into smaller and smaller units, in fact, its organization was not analytical. (Analytical in the sense that a whole is divided into elements which are able to function only as parts of a totality.) The fourteen army corps were actually fourteen complete armies with their own infantry, artillery, hussars, engineers etc. The military was built up by organizing independently operational units. This was one of the major Prussian inventions in organizational theory and practice.

Territorial division of the army had proved most useful since the time of Frederick the Great.

[I]n 1733, by parcelling his dominions into cantons, and assigning to each the duty of keeping up a regiment to its effective strength from its own limits, laid the foundation for the magnificent Prussian military system of to-day. It is difficult to overestimate the importance of this geographical distribution. It connects the army with the very framework of society, enlists local pride in its support, and, by diffusing responsibility, simplifies the administration of affairs. (Hazen 1872:137)

The canton system was further improved in 1808 by introducing the brigade organization. The brigades, one for each province, were to be directed by the General Kommandos or General Government of the provinces and comprised relatively independent and consequently flexible fighting units.

This it was hoped would overcome that previous tendency of the battalions to fight alone and without regard for the other units in the army, or for the actions of the other arms. (Shanahan [1945] 1966:131)

At the same time traditional, historical names of army units were replaced by territorial identification and numbers on lower levels. This development led to the situation described by Hazen above.

The great innovation of this system was that it combined the three types of administration, the territorial, functional and branch organizations, into a complex network.

Previously there had been a single hierarchy of royal authority with one master-mind and 'master-heart' at the top, whether Frederick the Great, Napoleon or a lesser figure like Metternich. Modern bureaucracy may be said to have originated in those times when, particularly in Northern Germany, the princes of different mini-states were financially supported by wealthy banking houses such as Fuggers' or Welsers'. Without an elaborate taxation system and with very few taxable subjects (nobility had tax exemptions) the princes were compelled to rely on the capitalists' help, so that inevitably independence from loans could be won only by establishing a new fiscal apparatus, the state bureaucracy (Kehr [1965] 1977:140-2). This trend to strengthen the royal power by administration continued until a substantial change came after the death of Frederick II (1786).

State bureaucracy's first move towards independence was to grant tenure to its members. Although public servants could have been removed by royal order at any time, in practice this right was not exercised. Misconduct or other breach of written or unwritten laws of society and profession was judged by a special committee set up by senior officials. This achievement, coupled with the establishment of retirement pensions and pension plans (1820 and 1825 respectively - Kehr[1965] 1977; Gillis 1971) brought into existence a new estate with its own

professional rules and myths, admission requirements and prerogatives. Bureaucracy from then on was self-accountable and jealously preserved its privileges (Gillis 1971; Rosenberg [1958] 1966). "The important thing, it was felt, was to protect the bureaucracy from royal intervention..." (Kehr [1965] 1977:145). If this was the chief goal, then it seems that it was achieved, for absolute bureaucracy superseded absolute monarchy.

The fight toward independence on the part of the public servant inevitably made him anti-aristocratic simply because the higher ranks of the old royalist administration consisted mainly of nobles. Efforts made to formally limit arbitrary royal intervention gave rise to the ideology of the "Rechtsstaat" in which the subjects of the state were equal before the law. On October 9th, 1807 an edict was published abolishing serfdom, opening all professions to the members of all estates and permitted the free exchange of land, previously limited to the members of the aristocracy (Henderson 1902:276). This was a mortal blow to aristocracy but the dubious consequence of this enlightened motion was that the souls that had been owned by the landlords now were subjected to state bureaucracy instead. After 1807 public servants enjoyed fixed salaries and were recruited on the basis of merit. Merit, in this case was almost equal to the level of educatedness, or culturedness (Bildung). Promotion too, became 'democratic' - it was based on the years spent

in the service of state institutions (Gillis 1971). The same spirit penetrated the military ranks as well; officer training paid no respect to the applicants' noble origins. Hazen hails the new system with a deep enthusiasm. "True democracy has taken such root in Germany..." (Hazen 1872:155). However, such a statement might have raised eyebrows in Prussia in the early 1800s, and even today in the 'Free World' democracy and the concept of the military state remain at odds.* The concepts of militarism, social progress and education were heavily intertwined in German thinking. The idea that embraced all three concepts was nationalism, so there was in the public consciousness a national army, a national progress and a national education. German national feelings were triggered partly by the French arrogance of Napoleon and partly by the painful defeats suffered by the world's best army. The catastrophes of

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\* Veblen points out an interesting parallel between militarism and obedience:

[The military organisation] reaches its best efficiency in either case, in war or peace, only when the habit of arbitrary authority, an unquestioning obedience has been so thoroughly ingrained that subservience has become a passionate aspiration with the subject population, where the habit of allegiance has attained that degree of automatism that the subject's ideal of liberty has come to be permission to obey orders, somewhat after the fashion of which theologians interpret the freedom of the faithful, whose supreme privilege it is to fulfil all the divine commands. (Veblen [1915] 1954:82)

Austerlitz (1805) and Jena (1806) and the subsequent humiliation of Prussia by the Treaty of Tilsit (1807) and of Paris (1808) cried out for a new spirit. The ideological background was provided by Fichte in his "Ten Addresses to the German Nation" which he read publicly in Berlin (1807-8). After the Holy Roman Empire had fallen, some German states, for example Saxony, were willing to humble themselves before Napoleon or even actively support him (as in the Rheinisch Confederation). Fichte's addresses came just in time to pour oil on the almost extinguished fire of German pride. His argument was one used frequently in German history, an argument based on the superiority of the German nation as a race. He called for unity and general resistance against 'alien elements'.

As early as 1803, even before the Treaty of Paris of Sept. 8, 1808, efforts were made to reorganize the Prussian army on a national basis instead of the traditional professional system. Kneesebeck, a widely published authority on military organization, suggested general conscription, and the abolition of exemptions. His idea was that the army be organized into three units, a standing, a reserve and a Provincial or Honor Legion force. This latter was intended to consist of the old and the unfit. His proposal was turned down. In Paris it became clear that Prussian military and consequently national revival was impossible in the old way. The army was limited to 36,000

men with an additional 6,000 for the Royal Guards. No extra levy, militia or civil guard was permitted. These severe measures meant the partial disarmament of Prussia as the size of the army and its trained reserves melted from the 53,523 of 1807 to 45,897 in 1809 (Shanahan [1945] 1966). In order to overcome the apparent difficulties and maintain a sensible military force invisible to the French observers, the top official of the army, General Scharnhorst implemented a new furloughing system, the Krümper. The Paris treaty limited the size of the standing army but those who drew up the treaty were thinking of old fashioned professional armies where men served 10-15 years, so they did not define the length of service. The Krümper, named after the name of the spare horse in an army's reserve, meant that the term of enlistment was limited to only a few months and after the strict drilling and training the soldiers were sent home on leave. The importance of the Krümper system was more theoretical than military. Although some contemporary and early authors estimated the number of trained men at up to 150,000 between 1807 and 1813 (Henderson 1902),\*\* a careful analysis of statistical data

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 ** Hazen assessed the numbers to be even higher:

Prussia was enabled during each year to return to their homes eighty thousand well-disciplined and instructed soldiers, which in the final struggle gave her five times as many veterans as were counted by the allies ... (Hazen 1872:148-9)

shows that the size of the army together with the Krümpe rose only to 74,553 by 1811 and dropped again to 65,675 by March, 1813 (Shanahan [1945] 1966). An important step towards universal conscription and the foundation of a national army was made in 1813 by establishing the Landwehr and the Landsturm. The Landwehr consisted of scantily trained civilians between the ages of seventeen and forty who were reservists in peace-time. The Landsturm included practically everybody who was able to fight in any way. The Landsturm were armed only with pikes, axes and pitchforks, they did not parade or gather for any military kind of exercise and were not permitted to wear a uniform. It was conceived as a guerrilla force of the army and its task was to destroy enemy supplies and harass enemy troops behind the lines.

2. The Effects on Education

With the establishment of the new national Prussian army a new phenomenon was born: a non-selective, compulsory system which was centrally directed and locally organized and offered an upgrading possibility for promotions based on educational qualifications. Military reforms of the first decade of the century wove the patterns for modern bureaucracy. This hitherto unknown way of organizing institutions provided a basis for the establishment of

similar systems in other fields of social life, such as public education. Fichte spoke out for universal and compulsory education as follows:

So there is nothing left for us but to apply the new system to every German without exception, so that it is not the education of a single class, but the education of the whole nation, simply as such and without excepting any of its individual members. In this, that is to say in the training of man to take real pleasure in what is right, all distinction of classes which may in the future find a place in other branches of development will be completely removed and vanish. (Fichte [1807] 1968:13)

While Prussian society became militaristic by making everybody a virtual soldier, at the same time this same process gave the army a civilian flavour. Universal conscription, for instance, was managed by civil authorities. Civilian and military jurisdiction converged. Running the gauntlet and other cruel punishments were abandoned. Scharnhorst himself said:

"A universal conscription ... could not be combined with the existing caning system. Military life must be more agreeable to the nation by removing its hateful aspects." (Cited by Shanahan [1945] 1966:137)

Opposition to corporal punishment in schools dates from the time when compulsory education was established. In both school and army, the removal of hateful aspects was bound up with the implementation of attractive ones. According to a law proclaimed Aug. 6th, 1808

"[E]very subject irrespective of birth or class might become an officer by meeting the educational qualifications that were laid down." (Cited by Shanahan [1945] 1966:13)

Thus, paradoxically, the Prussian military organization was the first large scale, state-run, compulsory organization of its kind. It was democratic too, in the sense that service was conceived both as a duty and as a right of every (male) citizen. Obedience and free will were viewed as being two sides of a coin. Compulsory state education of our times is based on this army philosophy. The connections between the army and education were clearly seen by contemporaries. The military was seen to be as morally educative as the factories were in England:

The moral aspect of military service is two-sided, though the preponderant effect is unquestionably good. The discipline of the barracks and the drill-ground is undergone in the critical time in a young man's life when he decides, habits no less than deliberate option, whether his future is to be characterized by self-control, by regard for order and obedience, and by lawful instead of a lawless liberty. ... When the Emperor's uniform is upon him, he must simply obey, be he count or clown, heir to opulence or heir to poverty - for both serve side by side. (Dawson 1908:187)

3. Educational Philosophy and Paternalism

Here was the cradle of modern bureaucratic democracy..

Pestalozzi, talking about society, vividly portrayed the delicate relationship between subordination and equality.

"A dwarf said to a giant, 'We have equal rights.'
 'Very true, my good fellow,' replied the giant,
 'and yet thou canst not walk in my shoes.'" (Cited
 by Krüsi 1875:106)

He drew a paternalistic picture of social organization in
 his earlier work, Education for Citizenship (1780).

The prince is at once the child of God and the
 child of his father and the father of his people.
 The subject is at once the child of God and the
 child of his father. The subject is both the
 child of his father and the child of his prince.
 A prince as such is comparable with God. How
 delicate, and yet how strong and beautiful, is
 this complex relationship of mankind! (Pestalozzi
 in Green 1916:27)

Like Hegel's, this explanation turns society into an
 exercise of mutual responsibility, an oscillation of rights
 and duties between father and child. Yet the child's rights
 look somewhat different in their nature from those of the
 father:

"The rights of a father in his children are
 equalled by duties toward them; as the duty of
 obedience on the part of the children implies
 their right to be educated into freedom." (Hegel
 cited by Luqueer [1896] 1967:145).

Later Herbart totally blurs the distinctions between duty
 and right, society and state, providing us with an example
 of how bureaucratic organizations wanted to think of their
 clients:

The state needs soldiers, farmers, mechanics,
 officials, etc., and is concerned with their

efficiency. Its attitude toward a large number of persons, whose existence as individuals has significance only in a narrow sphere, is, in general, far more that of supervision designed to prevent the harm they might do, than one of direct helpfulness. He who is able to render competent service receives preferment; the weaker has to give way to the stronger; the shortcomings of one are made good by another. (Herbart [1835] 1911:317).

Herbart lists the features of a modern administrative system: the branch organizations (of soldiers, farmers, and mechanics) and the functional units (of the officials) and he describes the complexity of a system where individuals are important parts but the chief objective is the perfect functioning of the whole, an impersonal totality which is the entire nation. The finishing touch is given by the up-to-date idea of "direct helpfulness" which penetrates the system superseding mere utilitarian supervision. Sources of this approach were deep-down in German education and sprang from the 'Helping-Father' image. Help had, however, a rather peculiar meaning.

A father, Erasmus wrote, will always support a small child taking its first steps. He will point to an apple placed a short distance away, suggest with encouraging words and signs that the child can reach it, then steady its faltering steps to the object, "so that led by its father it obtains the apple which the father willingly puts in its hand as a reward for running." Not so, counters Luther. Fathers act quite differently in such a situation, and with the opposite end in mind: "How often do parents have a game with their children by telling them to come to them, or to do this or that, simply for the sake of showing them how unable they are, and compelling them to call for

the help of the parents' hand!" This, Luther contends, is God's way with men. (Strauss 1978:136)

And so it is the state's way with us - if the comparison between patriarchal ideology and bureaucratic control is apt.*** According to Herbart in the first three years

A child must always feel the superiority of adults, and often his own helplessness. The necessary obedience is founded on this feeling. (Herbart [1835], 1911:200)

In this we hear of an echo of Luther. Humility was the moral cornerstone in the procedure to nurture ideal character. Pestalozzi, for example, who was called the "father of children", and was pictured as being loved by his pupils, wrote in the same vein when discussing the advantages of slates over paper in writing exercises:

A further important advantage is that the child rubs out his good work also, however much he might desire to keep it. He is thus practised in humility, and learns at an early age not to overvalue what he has done. (Pestalozzi in Green 1916:121)

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\*\*\* Pestalozzi gives a beautiful example of patriarchal authority bound up with institutional power in his Views and Experiences (Appendix III. 1805)

If a schoolmaster is a man with the spirit of love, of wisdom, of purity; a man who is fitted for his calling, and who enjoys the confidence of young and old; a man who esteems love, order, and self-control, as higher and more desirable than actual knowledge and learning; ... he will become in the true sense of the word a father to the

Herbart in his Outlines talks of the same principle:

The constant presence of the idea of perfection easily introduces a false feature in the strict sense. The pupil may get an erroneous impression as to the relative importance of the lessons, practice, and performance demanded of him, and so be betrayed into the belief that he is essentially perfect when these demands are satisfied ... The notion that something really worthy has been achieved needs to be tempered by humility. (Herbart [1835] 1911:14).

When the well-tempered children were orchestrated by their Master, it was not thought of as the exercise of external authority but rather as a support given to the young to help them achieve their own fullness of life, a step beyond mere animal existence. While Hegel admits that the child is a "reasonable being" he elaborates a point which is very similar in its logic to that used to back up the argument about rights and duties and the relationship between the particularity of the individual and totality of the state.

"But the reason of the child as such is at first only an inner, that is, is present only as a potency, faculty, etc.; and this inner at the same time has for the child the form of an outer, apparent in the will of his parents, in the knowledge of his teachers, and in the surrounding world. The education and culture of the child consists then in this: what he is at first in himself, and so, for others (the adults), he must become for himself." (Hegel cited by Luqueer [1896] 1967:108. - First italics mine) \*\*\*\*

To those who are familiar with the Hegelian philosophy this

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village... (Pestalozzi in Green 1916:182)

idea may sound familiar, carrying with it the reverberation of his general dialectics where substance, the ultimate inner, alienates itself in the outer, and makes the difference between what an object is and what it is not vanish.

"It is through culture that the individual is given his actuality and counts for something. His true original nature and substance is the spirit of estrangement from his natural being. This externalizing himself ... is his aim, and makes up his existence, it is the process of transition both of the ideal substance into actuality and, conversely, of the determined individuality into essentiality." (Hegel cited by Luqueer [1896] 1967:111)

Fichte seems to be of like mind on this topic. He claims

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\*\*\*\* Marxist ontology (e.g. Lukács and Gramsci) prefers to use the same trio of concepts. "In himself" or "an sich" existence is the state of natural rawness when somebody or something (a piece of wood) is nothing but itself (a piece of wood is lying in the forest). This is followed by the first phase of social existence, humanity, the existence "for others" or "für uns" (correctly: for us) that means a level where the individual has to submit himself to the laws of present societies. The particular is sacrificed on the altar of the development of the total, of mankind as a species. This is the phase when utility wins over in the realm of objects (the piece of wood is formed into a tool). The ultimate existence is the "for himself" or "für sich" being. This should be the state of communism where totality or society exists for the individual and he can spend all his energies to develop his potential. The dominant value of this sphere is art (the wood shaped into a sculpture bearing no 'practical' exchange value). Consistently Marx's value theory follows the same thread of thinking assuming that history inevitably leads from the primitive use-value stage through the class system societies of exchange value to the utmost perfection of mankind, communism or the return to use-value on a higher level of totality (Vide: Marx, K. The Poverty of Philosophy [1847] Chapter 1)

that the child's instinct for good and moral appears "as the desire to be respected by those who inspire in him the highest respect" (Fichte [1807] 1968:147).. This instinct is unselfish because it is directed towards the sterner parent, the father, and the natural love of the child for him is apparent because "only insofar as the father is satisfied with him is he satisfied with himself." (Fichte [1807] 1968:147). Love is the cornerstone of this philosophy, yet it is thought to be not sensuous, rather a form of abstract, almost Medieval, striving for perfection, truth and totality.

The love which spurs him on aims not at sensuous enjoyment, which quite ceases to be a motive for him, but a mental activity and the law of that activity for their own sakes. (Fichte [1807] 1968:26)

Quietly love is made equal to obedience, self-denial to merit, father to son.\*\*\*\*\* This makes nation, fatherland and state interchangeable concepts in this ideology, they are the notions of totality, somewhat similar to the Hegelian Absolute Spirit. The individual is inevitably a part of this totality, and blends into it by means of love and morality. The essence of the new German education is

"[T]he highest and, at present, the only urgent

\*\*\*\*\* An excellent analysis of love and values can be found in Max Scheler's Ressentiment (ed. by L.A. Coser, New York: The Free Press of Glencoe, 1961)

concern of German love of fatherland ... But that love of fatherland ought above all to inspire the German state... (Fichte [1807] 1968:160)

With all this in mind the student of German educational philosophy may read the words of Paulsen:

The nineteenth century state was actually transformed into an institution devoted to the advancement of universal culture and furthering the human and moral ideas of the nation for their own sake. The ideas of Fichte and Hegel foreshadowed what is now being realized. They saw in the state not merely an organization destined to secure national power or safety, but an institution intended to realize the moral idea." (Paulsen 1908:178)

In 1797 Pestalozzi put the following questions forward in his "Enquiries Concerning the Course of Nature in the Development of the Human Race" :

What am I, and what is man? What have I done, and what is man doing? What has my actual life made of me, what is man's life making of him? (Pestalozzi in Green 1916:56)

Later he asks only the question: "What am I as a Moral Being?". (Pestalozzi in Green 1916:72)

There is within me an inner force which enables me to look at the things of the world independently of my primitive animal desires and of my social obligations ... This force is the very centre of my being; it is entirely independent of all other forces, nor is it in any way the product of any of my other natural abilities. It is because I am, and I am because it is. It arises from the feeling that when I do what I ought to do; and I impose my own will as law upon myself, I am putting the completing touch to my own character.

(Pestalozzi in Green 1916:72)

The sentence which Pestalozzi italicises may puzzle the analytical thinker. It is a circular argument indeed but it was meant to be so; it is an essential of Hegelian dialectics. The thought starts from a particular point and returns to itself after interfering with its opposite. The method again chimes in with the Absolute Spirit conception which alienates itself in the material and finally returns into itself.

#### 4. The Theory and Practice of Self-Discipline

It is particularly important to understand that obedience in this circle of thinking emanated from love of order and its direction, therefore, was from the inside to the outside and not vice versa, not external authority pressing action on the individual. This may have had a longlasting impact on everyday life in early nineteenth century Prussia. The effect of this ethos can be detected first in military organizations. Berenhorst in his 1798-9 publications

[D]enounced the existing tactics ... he placed more stress upon the moral and spiritual values of the army than a formal drill learned by repetition. (Shanahan, [1945] 1966:66)

The stress on inner discipline rather than outer may have

paid off some seventy years later when the Prussian army, for the first time in the history of the military arts took to using breech-loading muskets en masse. The advantage of the new weapon was precisely its disadvantage too, it had a superior "rapidity" of fire over the muzzle-loaders. It allowed for a heavy, concentrated fire which did not last very long because the amount of ammunition carried was limited. These new guns had been manufactured in England but were in use in Prussia. General Hazen discusses the fundamental differences between units armed with muzzle- and breech-loaders.

In its [breech-loader's] use troops must be well controlled, and not permitted the same liberty of firing on their own impulse as with the muzzle loaders. (Hazen 1872:164)

Discipline and control in modern warfare is not the kind of parade and marching order it had previously been. Rather it is personal, individual discipline as for the breech-loader:

[T]here are two requisites to its employment - that the officers should control the fire of their men, and themselves have the intelligence to know when to order it. (Hazen 1872:164)

Fighting with the new guns meant more responsibility among the lower ranks which, in turn, necessitated more self-discipline besides obedience to superiors. Soldier and citizen were bound by a double bond of order. Fichte spoke out in favour of two kinds of subordination: obedience to



the law of the constitution and the individual's voluntary subservience to the law of the community "viz. the raising and advancing of the well-being of the community by self sacrifice" (Fichte [1807] 1968:150). The paradox, of course, was that the attitude toward state and nation was learnt in compulsory (not voluntary) schooling. Further on Fichte continues:

[T]he state which introduced universally the national education proposed by us, ... would need no special army at all, but would have an army such as no age has yet seen. ... [In the individual's] heart there lives love of the community of which he is a member, of the state, and of his country, and this love destroys every other selfish impulse. ... By means of our education the state will get working classes accustomed from their youth up to thinking about their business, and already able and inclined to help themselves. Now if, in addition, the state can help them in a suitable way, they will understand in a moment, and accept its instruction very gratefully. (Fichte [1807] 1968:163) \*\*\*\*\*

This feature of Prussian education, the perpetuation of the existing social order, was similar to that of the English, and may have helped the convergence of the two ideologies in

\*\*\*\*\* This idea corresponds with the notion of freedom. Freedom here did not mean the freedom of will. His freedom is that he wants to do what he ought to. This is, by the way, the origin of the Marxist doctrine about freedom being equal to recognized necessity. "Freedom of the will is destroyed and swallowed up in necessity" writes Fichte ([1807] 1968:17). Pestalozzi seconds it with another characteristic dialectical maze of thoughts: "the child must be educated by freedom to necessity, by necessity to freedom" (Pestalozzi cited by Pinloche 1901:158).

the twentieth century (more of this in Chapter IV). Frederick the Great, who had founded the national educational system, stated that

Young people should learn 'what they needed without encouraging them to run away from their villages to become penpushers.' (Hubatsch 1973:209)

Pestalozzi suggested in his "Education of the Heart" (Ephemerides 1780):

Man must be educated to internal peace .... Restfulness and quiet pleasure are the first objects of human education; they are the greatest need of the time. Knowledge and ambition should be subordinate to these; otherwise they become a source of torment and disappointment. (Pestalozzi in Green 1916:22 My italics)

The cabinet order of Jan. 6th, 1809 issued by the leader of Prussian progressivism, Baron vom Stein, circumscribed the objectives of education in a similar fashion:

The aim of primary schools is not to impart knowledge, but to form the judgement, common sense, the moral and religious spirits. (Pinloche 1901:297)

Or even decades later an objective outsider remarks that:

The elementary school is not to communicate knowledge, but to qualify the child for simple operations. ... The elementary school must confine itself to that elementary skill which every citizen needs, whatever his calling may be. (Hazen 1872:320-1)

## 5. Paternalism and Authority in School Architecture

Perhaps Prussian school architecture throws some light on how this value system was intended to operate in practice. School architecture in the true sense had not appeared in German territories before the seventeenth century (Becker in Otto [1963] 1966). The idea of considering school buildings separately from other buildings occurred when the role of education shifted from being ecclesiastical to political. The process was marked by the legal recognition of educational institutions and by the trend toward a schooling that was regarded less and less as a duty towards the church and more and more as an obligation to the community or to the state. The first compulsory measures were issued in Weimar requiring school attendance in 1619 (Paulsen 1908).

Joseph Furttenebach's Teutsches Schulgebaw (1649) indicates that the school in the seventeenth century German states was on its way to gaining independence from the churches. School features became similar to those of today in the second part of the eighteenth century. Unsuccessful efforts were made to enforce compulsory education in Prussia by Frederick William I in his 1716-7 rescripts. The 1722 formulation of the General Directorium, the highest governmental body, and the Geistliches (Spiritualities) Department were the first steps toward the establishment of

educational administration. There were a few local efforts to organize primary education on a larger scale than hitherto, with standard rules and professional staffing (See the Minden War Chamber and Domain Chamber's draft proposal for general school ordinance, and Johann Julius Hecker's teacher training school). Then the Prussian General-Landschul-Reglement (1763) devised the essential subjects to be taught in village schools, and fixed the hours of teaching, textbooks, and fees. Attendance became compulsory and for the first time parents or guardians could be fined if a child missed instruction. In the same year it was stated that no school master should be appointed unless he had passed Hecker's teachers' college examination.

### 5.1 The Rural Schoolhouse

The state's control over educational matters began in rural areas because in towns there were strong local policies. The state's concern was for the rural, village school, consequently the one-room schoolhouse. East and West Prussia were virgin lands for state bureaucracy in education. The 1765 "Royal Prussian Regulations for Roman Catholic Rural Schools in the Towns and Villages of the Sovereign Duchy of Silesia and the County of Glatz" were practically a carbon copy of the Landschul-Reglement, with the only difference that they were concerned with Catholic schools (Hubatsch 1973). This latter fact is worth

emphasizing because in the West Catholics, like Windhorst, kept trying to win back supervision over schools even as late as 1889 (Anderson, 1981). Plate III/2 shows a model plan from 1736-7 prepared for use in the Ostpreupischen Retablissements (East Prussian establishments). Similar schools were built in West Prussia (Henge 1967). A school fund was established in 1776. Ignaz von Felbiger was one of the more innovative workers of the educational administration in the East - his plan of a school is shown on Plate III/5, it was fitted, quite unusually, with more than one schoolroom. It is likely that the most common structure was something like the ones in Plates III/2 and III/3; one schoolroom with an apartment for the teacher. In some cases this plan was extended to include a small chapel (Plate III/3). Other plans from Nürnberg, Speyer and Bayern show a similar system (see Plates III/9,10,11,12,13,15,16). According to Paulsen ([1906] 1908) one-room schoolhouses were preferred until in the 1870s bigger buildings, the so called Schulkasernen, came into fashion. His 1861 data indicate 2,935 schools with 10,290 classes in towns and 21,828 schools containing 26,493 classes in villages (Paulsen [1906] 1908:255). That makes an average of 3.5 classes per town school and of 1.2 classes of rural school. Town schools constituted 11.84% of all schools while classes in towns amounted to 27.97% of all classes. If we suppose that there was little change in the fifteen years between

1846 and 1861, and accept the estimate of Gillis that 70% of the whole population lived in rural areas (Gillis 1971). then we may safely guess that by the middle of the nineteenth century the Prussian educational system served the bulk of the population for 72.03% of the nation's classes were in villages. Gillis has another datum of interest:

From 1816 to 1846 the percentage of children between the ages of six and fourteen who were attending school rose from 61 to 82 percent. (Gillis 1971:13)

This could scarcely be achieved in the cities for there were no factories to attract conglomerations of newcomers to towns, as in England (Gillis 1971; Ringer 1979). The fact that Prussian schools touched first the agrarian population and began with one room buildings is of special importance because in later years multi-storey buildings and multi-classroom schools were designed with the idea of multiplying the one-room school (Rodhe 1976). Plate III/7 is a vivid example of the idea. The school shown there was, however, a higher elementary school (Bürgerschule) in Schwelm. The War and Domain Chamber (Kriegs- und Domänenkammer) of Hamm (Westphalen) ordered local authorities to design the state's schools in a manner such that three parallel schools were built in a row: one for the Rektor, another for the Konrektor, and another for the Girl's schoolmaster. Each of the units had their own

separate entrance, kitchen, apartment for the teacher and schoolroom (Lange 1967:60-61). Keferstein's plan from 1791 also shows signs of unit-thinking: two almost identical schools were put together to form a bigger one (Plate III/6). Vorherr (1811) utilized the same idea in his design (Plate III/15). Robson, the English architect, describes the new Prussian town school in the second half of the century with special intelligence and perceptivity:

"There is a series of class-rooms entered from a wide corridor. He (the child) is placed in one of these, fitted with benches and desks precisely similar to, but smaller, than those used by boys twice his age, and there he commences that intellectual drill which is continued till the age of 14. Such a system must give a dull boy a better chance, for the most awkward recruit will make a tolerable soldier if drilled regularly, and ... for a sufficient long time. It can hardly fail to raise the masses of a nation. On the other hand the tendency to destroy individuality of character must be ranked as a loss." (Cited by Lange 1967:46)

The picture drawn by another educator visiting Prussia to whom Hazen refers to as "Mr. Kay" is less thoughtful but more precise.

"It was a lofty and handsome building, five stories high and sixty feet broad. In the two upper stories, all the teachers, ten in number, resided; on the lower floor there were ten classrooms, twenty feet long, fifteen feet broad, and fourteen feet high, fitted up with parallel rows of desks, maps, drawing-boards, and school books. Five of these rooms were for boys, and five for girls. The desk stood in front of all..." (Cited by Hazen 1872:331)

Arnold claims that the Fachsystem where pupils go to different classes to study different subjects (which can be done only in a integrated multi-classroom school) had gradually changed to the 'class system' by the middle of the century. In the class system, students remained in the same class for every branch of instruction.

This class or one-room system in Prussian compulsory education may be thought to have had further implications. First of all it seems likely that a patriarchal attitude was objectified in these structures. Even when separate buildings were designed for schooling purposes, the construction followed the rural pattern. Schools looked like and were arranged like private houses. In the eighteenth century an apartment for the teacher was essential to a good schoolhouse.

"Ein Schul-Zimmer ohne Wohnung kann keine gemeine Schul' genennet werden. Dann der ist armste Mensch in der Welt, der hinter ein fremdes Feuer sitzen muß." (Cited by Lange 1967:30)

(A school-room without an apartment cannot be called a complete school. As he is the poorest man in the world, who has to sit by the fire of others. - Translations of German excerpts are mine.)

It became commonplace to talk of schools as households in which the head of the house was the schoolmaster. (Rektor). The schoolhouse was actually the house of the teacher. Hardly any schools were built throughout the nineteenth



century without the provision of an apartment for the servant of the state. In multi-storey buildings the teacher's apartment was on the ground floor. In Plates III/2,3,4,5,6,7,10,11,12,13,15,16 it can be seen, that pupils actually had to go into the home of the teacher on their way to their classroom, for no separate entrance was provided. Sometimes learning spaces were located on the second floor with access through the living spaces on the first floor. Children could enter the school if and only if the teacher opened his door and let them pass through a little passway (Vorplatz) which in a sense belonged to his dwelling because he and his family had to use the same hallway too in order to enter the house proper, or the kitchen (Plates III/2,3,5,6,7,11,15,16) and the toilet (Plates 9,11,12,13,15,16) or even the bedroom (Plate III/16). Naturally in one-storey structures the school was indeed a part of the house. Frequently the schoolroom was heated from the teacher's kitchen, or the stove was in the classroom and the fire was fed from the kitchen (Plates III/2,3,4). Thus the school constituted a segment of the teacher's household and the teacher's haven was integrated into the school. By this architectural device it would seem that the state bound its servants to their profession while maintaining a high degree of loyalty, for dismissal could mean that a teacher would lose the roof over his head. Social security was then, and is now, a double edged weapon,

insuring security at the price of obedience.

The teacher's patriarchal role, spiced with love and discipline made school a sort of home away from home. In rural schools education took place in the biggest room of the teacher's house, in the "living room", as it were. Even 'father Pestalozzi' is shown in such a setting (Plate III/17), however, the researcher may have serious reservations about the authenticity of the etching. In his Leonard and Gertrude (1780) Pestalozzi depicts Gertrude's school. She taught spinning and reading at the same time. Skills for the trade were taught very quickly so the pupils could devote their full attention to reading a book put on an easel tied to the spinning machine. Children were arranged in rows: the little ones who could not read yet sat in the first rows and the older ones were seated in the back. Attention was maintained by a system that must be familiar to the reader of today, while reading

not one of them could be certain that she [Gertrude] would not suddenly call upon him to go on. (Pestalozzi in Green 1916:52)

The differences between Pestalozzi's words and the contemporary etching showing his school (Plate III/17) are stunning. (One of the major difficulties the historian runs into when examining pictures of certain settings is that the picture drawn by the contemporary artist is not what the place actually looked like, it is what he thought he saw, or

what he wanted others to think he saw. The problem is that a drawing is not a fossil, not so much an evidence of the material reality but rather reification of an ideology.) Restālozzi is important as a means to understanding state-controlled education because we know he was warmly greeted both by theoreticians such as Fichte and politicians such as Süvern, and as a result of the conceptual interchangeability of the notions of state, nation, society, community, the one of duty and right, and of love and discipline his ideas fell on fertile soil in Prussia. The interior of the schools seems to verify this interpretation of the relationship between authority and subject. Practically no school interior was intended to create an open, flexible space just because at that time 'freedom' in German meant that the pupil could do and wanted to do what he knew he was supposed to do.

## 5.2 The Devices of Control: Seating, Lighting and Acoustics

The shift from a diversely directed space, structured in units (Plate III/1) to a frontal arrangement came in the eighteenth century (see esp. Plate III/2). Something must have changed in the system that caused this universal upheaval in school architecture. Was it a change in the curriculum? Probably not, for Furttenbach designed his school for a curriculum quite suitable for elementary

education in the nineteenth century:

"zu recht fleißigen Schreiben, Rechnen u. der ... Buchhaltung zu führen ... gute Commoditäten [habe]" (Cited by Lange 1967:512)

([pupils] are driven towards diligent writing, counting and ... bookkeeping ... and good manners)

Reading and writing had been the main subjects in education since the Reformation as true faith could be gained from pure doctrine and )that was based on the Scriptures - the basic idea did not change until the end of the nineteenth century. The General-Landschul-Reglement of 1763 mentions singing, prayers, reading of scriptures, writing and learning the catechism as essentials (Hazen 1872; Hußatsch 1973; Paulsen [1906] 1908). A serious challenge to this curriculum did come from the reformers. Fichte went as far as omitting reading and writing from elementary schoolwork:

[R]eading and writing can be of no use in the purely, rational education, so long as this education continues. But it can, indeed, be very harmful; because, as it has hitherto done, it may easily lead the pupil astray from direct perception to mere signs ... to the dreaming which so often accompanies dealings with the letters of alphabet. Not until the very end of education, and its last gift, for the journey, should these arts be imparted and the pupil led by analysis of the language, of which he has been completely master for a long time, to discover and use the letters. (Fichte [1807] 1968:138-9)

Pestalozzi advocated experience first, words second, and finally reading and understanding (Pestalozzi in Green

1916:93). It seems that the frontal arrangement of desks was born and became universally accepted during a time of criticism of the idea of reading and writing as the first goals of public elementary education. Reading and writing did not disappear from schools but there was strong opposition to them. It is important to notice the air of pedagogical debate at this time because in a way it refutes the 'practical' argument of later times that children were/are arranged in parallel rows of desks facing the teacher because this was/is the ideal classroom layout for helping pupils learn to read and write, copy from the board or from demonstration plates. This argument was extended by explaining why all classroom windows were on one side of the room. The light was supposed to come from the left side so that no pupil would shade his writing with his hand - left handers were ignored. It is curious that while writing and reading was at the center of educational objectives children were seated in many different ways and lit from many different directions (see Furttenbach's school on Plate III/1 or even Lancaster's schools in the previous chapter) yet when the importance of reading and writing was being questioned seating and lighting became unidirectional. Bilateral lighting was often provided in German schools in the eighteenth century. Windows were usually on the left (if children faced the teacher) and the back wall (opposite to the teacher's place) (Plates III/2,3,4,8,9,10,13).

Between 1790 and 1820 monolateral lighting appeared (Plates. III/6,15,16). However, B.C.L. Natorp in 1811 describes a school with trilateral lighting and claims that it was commonplace, yet not one of the designs we have found show such an arrangement.

"Das Zimmer ist ein langliches rechteck und hat von drei Seiten her Licht. An der einen Schmalseite ist mein Sitz und ein freier Raum. An der andern Schmalen und den beiden breiten Seiten geht rings herum ein um einen Fuß erhöhter Sitz mit einem Pult für die Klasse der geübteren Schüler. In dem Mittelparke stehen die niedrigen Sitze für die untere Schülerklasse. An dem Wand hinter mir und zu meinen beiden Seiten hangen die schwarze Tafel und die übrigen Wandtafeln und Tabellen. Der freie Raum vor meinem Sitz ist so groß, daß ich eine Abteilung der Schüler nach der andern, allanfals zwanzig zusammen, kann vortreten lassen." (Cited by Lange 1967:94)

(The room has the shape of a long rectangle and has windows on three sides. At one end there is my seat and a free space. At the other end and on both sides there is a foot high elevated seat and desks for the class of advanced students. In the middle part there are lower seats for the less advanced classes. On the wall behind me and on both of my sides are blackboard, displays and charts. The free space in front of my seat is just big enough that I can deliver a demonstration lecture to a section of pupils, twenty at the most.)

From the beginning of the century, schools were planned with monolateral lighting so Natorp's arrangement cannot have been as common as he thought. The effects of this shift in design and thinking had its results later: by the middle of the century the 'Teutonic elementary schoolroom' was lit strictly from the left (of the frontally arranged pupils)

(Clay 1906; Robson 1874; Wheelwright, 1901). A convincing example is given in Plate III/8 showing the original and the rebuilt floor plan of the Luneburg Johanneum. The organizational structure, it can easily be seen, had not changed since its establishment (VI to I classes) but it was reconstructed in 1745. On the first ground floor plan of 1580 the rooms for distinct classes open from each other, necessarily curtailing the autonomy of each class. In the design after the reconstruction, this flaw has been corrected: at the cost of making the teaching areas smaller, they have been made of uniform size, completely separated and monolaterally lighted. Lange supplies us with a series of similar reconstructions (Vide: Lange 1967).

The importance of this new arrangement may have lain in the effect it had on school architecture, and may also be responsible for some of the myths we have now about schools. The assertion that pupils should face the same direction and receive the natural light from the left-hand side has had an impact on the structure of the schoolroom. It fixed the place of the teacher who, as a natural leader, or the 'outer' of the children's personality, could not be placed anywhere but in front of the pupils. While in the English schools the Master sat on a dais in order to be able to supervise the pupils, in the German schools, where mere supervision was considered to be only a 'negative' force in the process of education, the teacher had a 'cathedra' in

order to make him visible to the pupils so that they could be penetrated more easily by his almost divine 'positive' force of knowledge and character! Monolateral lighting thus enforced frontal arrangement in the classroom. Desks had to be fixed, even screwed to the floor. In the Anglo-Saxon countries multilateral lighting encouraged various arrangements of furniture until class-system and monolateral lighting made classrooms uniform (see Chapter IV).

Evidence for the bureaucratic characteristic of the system at this time is not to be found in the amount of paperwork as is often believed. In fact administration had been simplified. The so-called Schulkataloge was an elaborate report on each school prepared twice a year. The Duchy of Magdeburg alone, for instance, produced in three years 14,000 of these on 57,600 pages. In 1771 a simple annual form was introduced instead. Bureaucratization did appear in system-building efforts. A system implies that its elements contain some constant and common properties. A and B belong to the same set if they carry at least one universal (in the set at least) invariable characteristic. Up to a point uniformity is an asset in the smooth running of a system and so it is economical in centrally organized state institutional systems. Standard requirements in lighting, ventilation, and so forth, or even recommended or compulsory model plans were and are unmistakable signs of state intrusion into education. This argument will be



elaborated in the following chapters by the investigation of modern, twentieth century school architecture.

By the middle of the nineteenth century the most striking experience for Robson was:

"[T]he uniformity with which one system or principle planning is applied alike to different kinds of scholastic buildings. Herein lies the origin of much of the difference between a continental and an English schoolhouse. The system of public instruction is almost, if not quite, as military in spirit as that which governs the army, and the buildings do not escape the regime.... German schools may equally be classed as a series of small barracks." (Cited by Lange 1967:160)

Universality, unity and uniformity are, again, synonymous in the vocabulary of the contemporary German mind. As the contradiction between individual and totality is resolved dialectically, the practical solution to the same problem seems to enforce uniformity in favour of individual differences:

The Method ought to be Universal ... Not according to the wrong idea that men, that the faculties, the characters, the opinions, and the conduct of the pupils are to be equalised, and the differences of rank and position to be obliterated. On the contrary, the method desires that every pupil should grow out of himself into his position and into his surroundings. Its universality lies in the principles ... that every human faculty in the child is based upon the same organic impulse, that all art, all knowledge, just because it is individual, has the same unvarying, eternally fixed elements for all and never changes its nature. (Pinloche 1901:192)

Or we may call to witness a contemporary, Hegel, who was not only a philosopher but a very stern teacher, as well.

"The assertion, that a teacher must carefully adjust himself to the individuality of his pupils so as to develop it - this assertion is empty. The teacher has no time for that. ... with the school begins a life in accord with a general order, after general rules for all. In school the spirit must be brought to lay aside its particularities, it must know and will the universal." (Hegel cited by Luqueer [1896] 1967:113-4)

When the 'particularities' were put aside there was the universal and consequently uniform learning space. Interestingly enough the control of the body was as important a factor in German schools as it was in England at the same period. The logic of the approach was different but the result almost the same - schoolchildren were forced into benches where physical confinement was supposed to encourage spiritual concentration:

"To serve my spirit my body must first be educated. With animals, the body obeying its instincts carries out perfectly all things necessarily implied in the Idea of the animal. With man, on the contrary, control of the body must be gained by purposeful effort. ... Thus is developed a marvellous relationship - an immediate control of the Spirit over the body." (Hegel cited by Luqueer [1896] 1967:131)"

Furthermore, in a system where "obedience is the beginning of all wisdom" (Hegel cited by Luqueer [1896] 1967:122) and where, as we have seen, the teacher is an external

alienation of the pupil, the pupil's movement in the school was strictly disciplined. Control, or education of the body was not, however, confined to repression. Physical education, for instance, was thought important in Prussia: Father Jahn started his patriotic movement by putting exercise facilities into public parks and encouraging youth to develop their physical fitness. The movement was clearly an anti-French display of civic resistance and power and met repressive measures from Napoleon who threw Jahn into jail. Yet 'body building' kept its popularity and on Jun. 6th, 1842 the Cabinet ordered the Prussian government to recognize officially the usefulness and necessity of physical education in schools. The military nature of German P.E. (drills, marching etc.) obviously originated in the reorganization of the army, first the Krümper, later the Landwehr-Landsturm system. Besides the need to strengthen the defence forces there were other, rather theoretically based attempts to educate the body, principally in industrial activities in schools. The aim of teaching skills in different crafts was not utilitarian at all but on the contrary was to provide the children with an all-round culturedness. Work in the German culture did not mean production in the modern industrial sense but (as the young Marx analyses the nature of work in his "Economical-political manuscripts from 1848") the actualization of the self. Here, again, Hegel's thoughts

are apparent: the individual alienates itself in the object (the spirit in the material). Klemm sees a definite difference between the French and the German industrial schools and his observations back up our argument (Klemm 1903). In Plate III/15 there are separate rooms for industrial activities. Their interior design was supposedly similar to those shown on Plate III/19 creating again an interesting contrast with the sketch on Plate III/18 where the teacher poses in a posture we have already seen with Pestalozzi, surrounded with happy children in an open space. (It must be added that Klemm's illustration is not of a public school but of a so-called Knabenhorst or asylum for boys.) In the ground plans it can be seen that work tables were neatly arranged, in one of the plans (left) they are arranged frontally like the benches in a classroom. The teacher's work table is always well defined, bigger than the children's and placed in a strategic position in the work room.

Here is the root of another long (ever?) lasting myth in Prussian schooling, namely silence in the classroom. I have tried to show in the previous chapter that, in a system of educational theory where utility and efficiency were the key notions, pupils were taught in masses. It may be supposed that a considerable amount of noise was made by three hundred children in one large room. Curtains were hung over the heads of pupils in the Lancastrian school room

to improve acoustic conditions. Builders avoided plastered walls for the same reason. So it is hard to believe that as a general rule silence was maintained in much smaller classrooms with significantly less children in them (60-75) merely to foster efficiency. Architecturally engineered silence was hardly an asset to work in a classroom where the teacher was the controller of the situation. Control and silence were in delicate balance:

"A school that benefits its scholars must require quietness and attention in hours of study, moral behavior toward teachers and fellow pupils, the performance of set tasks, and obedience. But their actions in things indifferent, which do not effect the order, must be free. An air of serfdom is wholly out of place in the schoolroom." (Hegel cited by Luqueer [1896] 1967:150)

Attention, quietness and the quality of thinking were intertwined. Schoolrooms were designed without any acoustic aspect in mind not because of the ignorance of the architects (they knew what to do in Lancaster's schools) but just because children were supposed to be quiet. Moreover, the teachers' control was in some respects made easier by spaces where every little noise was amplified so they could detect the signs of loss of attention. This is particularly true in the design of the Schulkasernen, the multi-storey and many-classroom buildings in which the Long-Corridor-Syndrome was launched on its voyage to conquer school architecture in general. It is clear that long and

empty corridors running into huge and high halls reverberate every little sound enormously. Much of the noise made by the pupils either in the classroom or in the corridors could have been absorbed by absorbent walls but that would have opposed the basic idea that it was the child's duty not to make any noise. This is fundamentally different from the utilitarian approach that it is important not to be disturbed by noise. Pestalozzi, for example, strongly disagreed with using the Socratic-method in education for it could lead to early and not fully understood opinion. He wrote "Knowledge begins in experience, and not in words." and that he "rejected the verbalism of the schools of our time" (Pestalozzi in Green 1916:98-9). For him and for his contemporaries verbalism obviously did not mean the verbal statements of the teacher but only of the child. The child was supposed to sit still and listen quietly.

"Thought is enriched, and the mind is vitalized by silence ... The pupils of Pythagoras kept silence during their first four years; that is, they were not to have personal ideas and thoughts, or to express them. For the chief end of education is to do away with these personal ideas, thoughts, reflections of youth, and their utterance." (Hegel cited by Luqueer [1896] 1967:140-41)

## 6. Summary

In this chapter we have seen that a genuinely new educational thinking emerged in German territories in the

early nineteenth century. It was fundamentally different from the contemporary English utilitarian philosophy both in its aims and methods. While English utilitarians emphasized an overt repressive control over children in order to encourage maximum efficiency in teaching, German educators intended to plant a moral "compass" into the child so that he would control himself in his further life. This was done by implanting an unconditional devotion to the German nation. In German philosophy the concepts of nation, (nation-)state and society became interchangeable. This opened a door for voluntary submission of the interests of individuals to the state. This unequal relationship between citizens and the state revealed itself in nineteenth century Prussian militarism. The analysis of the Prussian army organization showed the birth of a new phenomenon, the modern state bureaucracy. Since education was organized on the lines of governmental departments, the echoes of bureaucratism could be heard in schools as well.

It has been argued that school building practices reinforced governmental intentions in controlling children. Paternalistic patterns were common in German school designs in order to give an impression of 'natural' dependence on the teacher and hence higher authorities. Architectural uniformity entangled with uniformity in curricula and methods of teaching contributed to coining a national educational system. Thus motives behind furthering

uniformity in schools were in order to unite the nation into a state. In the Lancastrian schools everything and everybody had its own place in production; in Prussia a similarly strict spatial control was achieved by teaching self-sacrifice or self-control. Voluntary submission to the teacher was a moral action toward the development of the state, hence of the nation and indirectly of mankind. The inscriptions in classrooms and on facades of schools illustrate the point: "Für menschen Bildung" (For human culture - Plate III/16) or "Für Gott und Vaterland" (For God and fatherland - Plate III/12).

In the next chapter we will investigate how these two genuinely different educational systems converged both in their philosophy and their daily practice.



## CHAPTER FOUR

### Schools of Transition

This chapter focusses on some new trends in education in the second part of the last century. These trends are characterized by new strategies for the control of schools by the state and for the control of children by schools. It will be argued that science in pedagogy, in school curriculum and in architecture tended to be a device in the hands of central authorities for maintaining this control. My intention is to show how and why national differences in English, German and American educational philosophies disappeared in practice.

We find two models of state intrusion into education at the middle of the nineteenth century: the legal and the financial ways of control. Legal measures, in the form of school laws, were practiced first in the German states - Hughes-Klemm (1903) enumerates twelve such laws which were enacted between 1802 and 1835. These were mainly laws on compulsory attendance. Educational bills were introduced in

the English Parliament too (10 between 1796 and 1855) but none of them was passed (Hughes-Klemm 1903; Jones 1977; Midwinter 1970). On the North American continent the state still does not have monopoly over schools in the legal sense. Financial control developed in Britain. The state seized power from voluntary societies by establishing grants (starting in 1833) which were awarded first to the Societies and later to schools which worked well according to the H. M. Inspectors of Schools (See: Revised Code 1862 - "payments by results" system) (Hughes-Klemm 1903; Midwinter 1970). In Germany the situation was different. For example, teachers' salaries

[A]re fixed, and rise with the years of service, instead of depending on the results of examinations, or on scholars' attendance. The principle of bribery which was introduced into the English system by a mercenary and business spirit ... is unknown in Germany.\* (Dawson 1908:113)

I argue that in the third quarter of the nineteenth century there was an unprecedented convergence in educational theory and practice despite national differences. The reason for this, I believe, was the appearance of a new controlling strategy, professionalism. It developed in parallel in Germany, Britain and North America and helped to cast a new international idea of education. An index of this convergence is the development of school designs. First let

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* He refers to the "payments by results" system.

me give a brief account of the immediate architectural antecedents of these schools.

1. Architecture

In the previous chapters I argued that in England a new and unprecedented organization of learning space had emerged, the monitorial system. By the middle of the century there were signs of decline in its popularity and the Lancastrian (or Bell) method had been first improved and later completely abandoned. Schools in Anglo-Saxon countries came to have similar floor plans to the German model which had not changed substantially throughout the nineteenth century. The first question for us is: To what extent was the development of English and American school architecture triggered by German influence or was it an independent evolution which ended up with similarities to the Prussian style?

Germany

The fact that school plans in German speaking territories did not change functionally in the nineteenth century, can be easily proven. First of all, schools were divided into classes. Mann wrote:

In all places where the numbers are sufficiently large to allow it, the children are divided according to ages and attainments... (Mann [1844] 1950:84)

One teacher was assigned to one class or a few classes, and every class had its own classroom. The designs Schmidt (1967) quotes illustrate the point (Plate IV/1). There are plans for rural schoolhouses showing their internal arrangements. They date from 1806-9, 1826, 1835 and 1895. The allocation of spaces was practically the same in all designs. The teacher's place was always at the entrance to the room, back to a windowless wall. He apparently had a 'podium' or Katheder (except probably in the 1895 plan) which was placed exactly on the longer axis of the room. He had a single desk substantially larger than those of the pupils who sat in two parallel rows of desks (first at tables on benches, later in subselliums which were combination desks and seats). In one row sat the boys and in the other the girls. The two rows were separated by a corridor. There were four or five places or seats in one desk. They all faced the teacher's place. Mann's Report depicts a similar picture:

The universal plan, whether for schools, gymnasia, or colleges, is, to have one long bench or form, on which ten or a dozen pupils can sit, with a table or desk before it of equal length, to be used in common by the occupants of the seats. Each room has an aisle, or vacant space along the wall on one side, and sometimes on both. (Mann [1844] 1950:48)

The differences in the designs should be mentioned as well. In the 1806-9 "Düsseldorfer Normalpläne" the first two banks in the right and the first four in the left side

row seem to be narrower than the others. The reason was that in the front there sat the small children who were not to write yet. They were seated on plain benches (Plate IV/2). We have seen in Chapter III that in the early nineteenth century writing (and sometimes even reading) was considered to be of less importance than before. Later on, when both reading and writing became essential in German schools uniform desks were assigned to every pupil. Another difference, according to Schmidt (1967), was that until the middle of the century schoolrooms were lighted from at least two sides. Schmidt (1967) brings several examples to support his point (e.g. plans from 1806-9, 1826 and 1835 in Plate IV/1) but I found monolateral lighting appearing in 1811 (Plate III/13,15). It seems to be likely though, that bilateral lighting was dominant in the first half of the century. In the 1850s, when interest in hygiene started, there were suggestions that:

"Die Aufstellung der Subsellien im Klassenzimmer muß so geschehen, daß das Licht zur linken Hand der Schüler einfallt und diese den Platz des Lehrers gerade vor sich haben." (Grafe [1850] cited by Schmidt 1967:193)

(The arrangement of 'subselliums' must be made so that the light would come from the left side of the pupils and that they would all face the teacher's place.)

From this time on monolateral lighting became fashionable. Spaces in schools were organized with left-hand-side lighting. Adhering to the rigid rule of monolateral

lighting sometimes cost the teacher his key position at the entrance door (see the 1895 plan in Plate IV/1).

England

In England the situation was quite different from that in Germany. David Stow, a Scottish educator, established his Glasgow Infant School Society and its first school in 1828 (Burchell 1980). He developed the invention of Samuel Wilderspin who had extended monitorial education by building a "gallery". Gallery lessons were given mostly to infants and were administered by the Master himself. The gallery was designed as shown in Plate IV/3. Wilderspin in his "Early Discipline Illustrated" (1840) described the painstaking efforts of a nineteenth century innovator.

"Whatever children can see excites their interest, and this led to the idea of grouping them together, to receive what are called 'object lessons'. First, they were placed at the end of the room, but this was inconvenient; parallel lines were drawn in chalk across the room, and they sat down in order on these; but, though the attention was arrested, the posture was unfavourable; some pieces of cord were afterwards placed across to keep them in rank and file, but this led to see-sawing motion, it was discontinued; I then made various experiments with seats, but did not succeed, until at length, the construction of a gallery, or succession of steps, the youngest occupying the lower and the eldest the higher, answered the desired end." (Wilderspin [1850] cited by Burchell 1980:5)

Thus there were two essentials : (1) children were supposed to see the objects shown by the teacher; (2) they had to be

in "rank and file". Plate IV/3 shows the system at work. The novelty of the system was to put the teacher in the focus of the schooling process. This was done by seemingly concentrating on the 'objects' which constituted the material of the lessons but it also put the teacher in a position where he explained the object or supervised its 'right' description given by the pupils. The etching in Plate IV/4 shows nine little German prodigies listening to ~~the~~ teacher while he shows the objects or pictures to them. I would refer back to what I have said about the growing importance of sensual perception of individual objects or particulars which was seen as an essential prerequisite to rising to the level of abstraction and generalization. We saw, for example, Pestalozzi and others surrounded by admiring children (Plates III/17,18 and IV/4) and giving their object lessons (in theory at least) in a super-familiar environment. Not so the British. By the special space arrangement of galleries all feelings of a familial kind were extinguished; the distances and the "rank and file" were designed in the name of strict efficiency. It is also interesting to see that while the Germans elevated the teacher by providing him with a platform, the British did the opposite: they developed a system of benches placed on steps. It is fair to say in the light of differences that the gallery system in Britain developed independently from German pedagogy and it was much more tied

to the revitalized English empiricist philosophy and psychology than to Pestalozzi, Basedow or Froebel. References to these latter authors by Kay-Shuttleworth, Spencer and others were usually mocking. The English approach to German authorities on education might be well exemplified by the words of Spencer, who, while he approved of Pestalozzi's theories in principle, could afford to write that "His [Pestalozzi's] proposed lessons in geography are utterly unpestalozzian." (Spencer: Intellectual Education [1854] 1966:57).

Plate IV/5 shows an 1835 design for the monitorial instruction of 200 pupils. The schoolroom was arranged in a very long rectangular shape. A new development was the appearance of a classroom in which either the teacher or his assistant could teach a small group of children. The Wilderspin-Stow method quickly spread from the narrow territory of infant education to elementary schooling. The pupil-teacher method which took the place of monitorial teaching also had a positive effect on developing teacher centered education. Voluntary societies, such as the British and Foreign School Society, were at pains to catch up with new ideas while preserving their traditional organization. In 1845, the so called "Tripartite scheme" was put forward with the approval of the Committee of Council. Children, as well as subjects, were divided into three grades,

(1) subjects of oral instruction, (2) reading, (3) silent occupations. For the first, silence was regarded as essential, and accordingly they should be taken in a classroom provided with a gallery. (Birchenough 1925:340)

(We see the earlier argument in Chapter III being supported here: silence became essential to education when the number of children being taught was decreased substantially by the use of classrooms.) Plate IV/6 illustrates the system. The schoolroom was subdivided into three functional units which were separated from each other by curtains. The curtains acted as walls.

Lessons lasted for three-quarters of an hour, and the pupils might be arranged at a given moment as follows: gallery - English history; desks - written arithmetic; drafts on the floor - Scripture reading. At the change of lesson each set of three classes, e.g. 1, 2, 3, would interchange places. (Birchenough 1925:340-41)

In 1840 the Committee of Council issued a series of model plans, which precisely mirrored the delicate political situation. In Plate IV/7 there is a plan for classroom teaching, and another two (smaller ones) for teaching by the monitorial system - one Lancastrian plan favoured by the British Society and the other, utilizing Bell's method, for the National Society. In the classroom design it is interesting that the floor was inclined as it had been in the Lancastrian schools - a practice which was never exercised in German schools. This suggests that the appearance of classrooms in English schools was not likely

blocking visual communication. With the use of the classroom system (the first school of this kind was built in London in 1837) the teacher's place became fixed. He or she occupied a strategic position in front of the pupils, well identified by its allocation and furniture.

In the pupil-teacher's or assistant master's desk, placed in front of each class, it will be well to devote some space in which books, slates, pens, and ink may be kept under the charge of one of the assistants. Individual responsibility is thus fixed. (Robson 1874:384)

The relatively large empty space (about 23 x 20 feet) was the antecedent of central halls in elementary schools. It was used for teaching purposes but it also served as a traffic distributor because all classrooms opened from it. The main entrance and the adjoining lobbies opened to this space too. In Plate IV/8 a design from the same series named the same functional unit (26 x 24 feet) as Hall & Infants' school. It is also interesting that teachers' apartments appeared at this time when governmental support and professionalism in education was just beginning to grow in England.

A suggested design of the Committee of Council in 1844 shows another development that was to do away with the monitorial system (Plate IV/9). Wilderspin's chalk and talk system changed

[T]he previous practice of making the children stand in semicircles on chalked lines; it was now usual to

form hollow squares, a shape dictated by the use of straight benches. (Seaborne 1977:142)

Children were now made to sit in school during almost the whole teaching period. The parallel columns of rows of benches was another new arrangement. The reason for this was to make the master more audible and visible. The conditions of supervision would not have been improved if, in the same schoolroom, the desks had been arranged along the longer walls rather than parallel with the shorter ones as in Lancastrian plans. Designs from 1851 (Plates IV/10,11)*, suggested also by the Committee, support the argument. The master was simply physically unable to supervise all children from one end of the room because the curtains dividing the classes were drawn forward while pupil-teachers were teaching. He could not see everybody from the middle either because of the wide angle he would have to scan - as was painfully explained by Lancaster in Chapter II. The plan in Plate IV/11 definitely excludes any intention of personal supervision by the master, for the school was designed in an L-shape. It is surprising, therefore, that the "Memorandum Respecting the Organization of Schools in Parallel Groups of Benches and Desks, Issued by the Committee of Council on Education" (1851) said:

The head master, seated at his desk, placed against the opposite wall, or standing in front of any one of the classes, can easily superintend the school... (Memorandum... in Clarke 1852:Addenda)

What he could superintend were the teachers or pupil-teachers. The first of the "Preliminary remarks" in the Memorandum was that:

Every class, when in operation, requires a separate teacher, be it only a monitor acting for the hour. Without such provision it is impossible to keep all the children in a school actively employed at the same time. (Memorandum... [1851] in Clarke 1852:Addenda)

It is stated that it would be best for the headmaster's work (which needs extreme concentration):

[I]f each teacher held his class in a separate room; but such an arrangement would be inconsistent with a proper superintendence, and would be open to other objections. (Memorandum... [1851] in Clarke 1852:Addenda)

The "other objections" remain veiled in the document but it is clear that the function of the headmaster had changed fundamentally. He was not to supervise each and every child or the school as a whole but his task was to superintend the teachers or pupil-teachers. His position has now irreversibly changed from being an educator to being an administrator to (over?) his teachers.

Analytical thought, which pervaded the early nineteenth century English educational thinking, was superseded by quasi-scientific patterns of observing particulars and deducing generalizations from them. Space distributions in schools followed a similar pattern. The huge homogenous space of Lancastrian schools followed the analytical system

(see Chapter II) while the Committee of Council's mid-century plans were built up from functional units (3' x 8' seats for classes). The units were arranged in different shapes to constitute different schools, acting almost, as modules. We will see later that gradually the optimal size of schools or classrooms was no longer expressed merely by the length and width of the schoolroom but by determining the average square footage provided for each pupil. The concept of valuable knowledge as well as the school building itself was meant to be the proper arrangement of heterogeneous elements, units or particulars.

North America

In America there was little tradition in school architecture in the middle of the nineteenth century, yet school buildings in New England were characteristically American both in their outside appearance and internal arrangement. It may sound odd to talk about about "American style" in the architecture of these schools which looked more like Greek temples than schools (Plate IV/12) but it was exactly this feature that made them unique. Greek revival in this form was utterly American and had very little to do with the contemporary Prussian gigantomania of Schinkel. It was rather the expression of republicanism, calling for the spirit of democracy - within certain

American limits:

Every schoolhouse should be a temple, consecrated in prayer to the physical, intellectual, and moral culture of every child in the community, and be associated in every heart with the earliest and strongest impressions of truth, justice, patriotism, and religion. (Barnard [1848] 1970:55)

New forms of professional designs, other than the imported models of the British Society, appeared in the 1830s. In 1831 the American Institute of Instruction offered a 20 dollar prize for the best essay on the construction of school houses. Several entries were examined and the prize winning essay, together with some other worthy papers on the subject, was published. William Alcott's prize winning essay contained a design which offered something different from the monitorial system (Plate IV/13). His school house had two separate entrances, one for boys and another for girls, or in the case of a different organization, one for the older and one for the younger pupils. The schoolroom was unusually large, 35 x 30 feet for 56 children. There were 8 rows of desks, with 7 seats in a row. Desks were all individual and faced the desk of the teacher's place which was situated on a four feet wide and 18 inches high platform. The teacher thus

[C]an oversee them from his platform, and pass, with the utmost ease and facility, from one to another, to direct or aid them, inspect their books, book-cases, slates, writings & c. If lessons are given, or exercises performed on the black boards, either over the instructor's platform or on the wall, they will

be in full view of all the scholars, without moving from their seats. (Alcott 1832:11)

He advised, though, moving the children occasionally from one side of the classroom to the other and vice versa because their bodies were constantly twisted in the effort to see the teacher or to read their books in a proper light. One subtle reason for providing the children with such an abundance of space was revealed by Alcott talking about the internal arrangement of the school.

Each pupil is situated about three feet from his neighbors, at the right and left, and separated by the whole width of a desk from those who sit next to him in the other direction. Of course, it will be rather difficult for one to communicate freely with another; at least without the knowledge of the instructor. At present, it is not uncommon to see half a dozen heads huddled together. They may be engaged in study; but they may, too, be doing mischief. (Alcott 1832:20)

Behind the rows of desks an empty space was left for recitations. It was secluded from the rest of the school by two movable partitions acting as blackboards and seats for reciting pupils at the same time. What has not changed was the position of windows. They were still on both longer walls of the schoolroom at a height so as not to distract pupils.

Alcott's designs must have been revolutionary because the examining Censors of the Institute saw the necessity of attaching an alternative plan to the prize winning essay (Plate IV/14). It offered a middle-of-the-road solution: a

seemingly monitorial system with individual desks and seats for pupils - a practice unheard of in Lancastrian designs. William Alcott was a pioneer of modern school planning although it is usually Horace Mann's 1838 plan which is mentioned as the first of its kind, but a short glance at his sketchy design should convince the reader that the plan had almost nothing new to offer (Plate IV/15). The only innovation was the little room for recitation or "for retiring in case of sudden indisposition, for interview with parents" etc. Yet Mann's plans were important because they served as models for decades. Henry Barnard's designs some ten years later were almost identical with them (Plate IV/16). (Barnard knew about Alcott's efforts but devoted much more space and honour to Mann in his 1848 book.) The novelty of these plans were the separated recitation rooms. Barnard added some further steps in his theory. Discussing the internal arrangement of schools he established the basics of modern functionalism:

[The seats] should be so arranged as to facilitate habits of attention, take away all temptation and encouragement to violate the rules of the school...
(Barnard [1848] 1970:69)

Considering the organization of schools he assumed that pupils should be divided into at least two classes according to their age.

In a large school, properly classified, a division of labor can be introduced in the department of

government, as well as in that of instruction. By assigning the different studies to a sufficient number of assistants, in separate class-rooms, each well qualified to teach the branches assigned, the principal teacher may be selected with special reference to his ability in arranging the studies, and order of exercises of the school, in administering its discipline, in adapting moral instruction to individual scholars, and superintending the operations of each class-room, so as to secure the harmonious action and progress of every department. (Barnard [1848] 1970:90)

From this it seems that German influence on American school architecture was very strong. Horace Mann in his Annual Report in 1843 gave an account of his travel in Europe and praised German schools. At the end of the century a flood of American educators went to visit Germany. Nevertheless it can be said safely that the development of American school architecture was propelled by intrinsic powers rather than Prussian ideas. Take the example of Alcott, who drew his plans well before Mann's enlightening journey but whose groundplans resemble contemporary German designs in their structure; the motives behind certain solutions were definitely different.

2. Birth of The Science of Education

Educators of the new German Second Reich (1871), of the newly established English national school system (1871) and of America came to understand that education was in need of solid theoretical foundations of its own. Education, until this time had been either a philosophical (Germany),

social-economical (Britain) or political (United States) problem. Thus educational theories and systems differed widely depending on national characteristics. Science in education promised a chance to make an objective, international theory. It offered educators an indispensable system of arguments to support and justify why and what they taught. The new Science of Education was seemingly free of ideological preconceptions and economical or political biases. The backbone of the theory was psychology, a new science based on biological natural laws.

It all began with Darwin who seemed to have found the ultimate law of nature and society. The development of society and even the individual was explained in an evolutionary manner providing philosophers with a satisfactory theory suggesting that social rules are basically natural laws. This opened a door to a myth of science that came to pervade education. Here were the germs of experimental psychology. Spencer wrote in his essay on "Intellectual Education" in 1854:

[I]n education, we are finding that success is to be achieved only by making our measures subservient to that spontaneous unfolding which all minds go through in their progress to maturity. (In Spencer [1861] 1966:53)

The result of this was that social control changed from being mainly restrictive (Negative - Germans would have said) to "positive", i.e. education is the help by which the

individual unfolds his real aptitudes. Birchough found the roots of modern pedagogical thinking in these changes at the end of the century:

[Old theories] give an over-emphasis to introduction, to imposing education from without, whereas modern theory under the influence of biological thought inclines to lay stress on the spontaneity of the individual and on self-education. (Birchenough 1925:329)

Another thread connects Spencer to his unwanted philosophical relatives in Germany: his concept of science. It was as broad as that of the Germans, including not only natural sciences but social disciplines as well (Low-Beer 1969). He approached the question of education as a naturalist. He stated that:

Our first step must obviously be to classify, in the order of their importance, the leading kinds of activity which constitute human life. They may be naturally arranged into: - 1. those activities which directly minister to self-preservation; 2. those activities which, by securing the necessities of life, indirectly minister to self-preservation; 3. those activities which have for their end the rearing and discipline of offspring; 4. those activities which are involved in the maintenance of proper social and political relations; 5. those miscellaneous activities which fill up the leisure part of life, devoted to the gratification of the tastes and feelings. (In Spencer [1861] 1966:7)

Further he assumes that "biology and psychology are indispensable as interpreters of sociology" (op.cit. p.29). Since education was seen as preparation for adult life in society, it had to be based on psychology. Herbart in 1835 wrote:

Pedagogics as a science is based on ethics and psychology. The former points out the goal of education; the latter the way, the means and the obstacles. (Herbart [1835] 1977:2)

Pedagogy, the science of education, was thus born in Prussia. When at the fin de siècle Herbartianism spread to almost every European and American country it was adjusted to modern circumstances. Psychology, the "statistics and mechanics of mind" (Herbart in Dunkel 1970:10) received the most attention. Ethics, which had a taste of arbitrariness, disappeared from the definition of education:

[E]ducation is a science based on the study of psychology and the laws of the natural evolution of the powers of the child... (Hughes-Klemm 1903:16)

It merits a short note here that while Fichte in early nineteenth century Prussia perceived the development of the child as the result of education ("Its pupil goes forth at the proper time as a fixed and unchangeable machine produced by this art..." Fichte [1807] 1968:31), in the last decades of the century education seemed to be the consequence of natural development ("Neither in their physical nor in their spiritual natures, does the speed of children seem to have been graduated by any one clock." Mann [1848] 1950:112).

Psychology, the handmaiden of pedagogy, provided education with a solid foundation (Felkin and Felkin 1898). What psychology and the theory of education was used for is clear from Sir James Kay-Shuttleworth, a politician who may well represent the psychological layman in education, wrote:

To have a clear and earnest conviction of the reality of the things signified, the object of the child's instruction should as frequently as possible be brought under its eye. Thus Pestalozzi was careful to devise lessons on objects in which, by actual contact with the sense, the children were led to discern qualities which they afterwards described in words. ... we contend that it is important to a right moral state of intelligence that the child should have a clear perception and vivid conviction of every fact presented to its mind. We are of opinion that to extend the province of faith and implicit unreasoning obedience to those subjects which are the proper objects on which the perceptive faculties ought to be exercised, and on which the reason should be employed, is to undermine the basis of an unwavering faith in revelation, by provoking rebellion of the human spirit against authority in matters in which reason is free. (Kay-Shuttleworth, J. "The Training School at Battersea." in Tholfsen 1974:106)

Thus, with the emphasis on the "right moral state of intelligence", once quietly discarded ethical principles were rehabilitated under the veil of empiricist psychology. But this psychology was very far from that of Herbart. It concentrated on the objects around man instead of his 'inherent faculties' and thus was the first step towards behaviourism and behaviour modification for it started to manipulate the environment in order to direct behaviour. For Herbart experimental psychology would have been nonsense; his psychology was metaphysical, and there was no room for any modern scienticism.

The empiricist argument was not only in favour of science in educational theory but was also useful to support

scientific content in elementary schools. The appearance of science in the elementary curriculum was another unique characteristic of the second part of the nineteenth century. It is clear from Kay-Shuttleworth's argument that object lessons (the ancestors of modern science teaching) were to provide tangible proofs for theoretical reasoning. This was the reason why Spencer agreed with Pestalozzian principles. The moral consequences of teaching science were presented by him in his essay, "What Knowledge is Most Worth?" (1859):

Not only, however, for intellectual discipline is science the best; but also for moral discipline. The learning of languages tends, if anything, further to increase the already undue respect for authority. Such and such are the meanings of these words, says the teacher of the dictionary. So and so is the rule in this case, says the grammar. By the pupils these dicta are received as unquestionable. (In Spencer [1861] 1966:40)

The controlling aspect of science education was clearly expressed by Spencer in his essay on "Moral Education" [1858]. In bringing up a child you should be acting as a hot cinder which burns uncompromisingly every time the child touches it.

If you are equally consistent - if the consequences which you tell your child will follow specified acts, follow with like uniformity, he will soon come to respect your laws as he does those of Nature. (In Spencer [1861] 1966:111)

Thus the first step must be to make him respect the laws of Nature. In practical terms this discipline was taught by replacing rule teaching with observations. Rule teaching in

the old days meant that children were given an epistemological grid through which they saw and interpreted the world. An a priori rule (religious or other) was given to them and they tried to fit particulars to the learnt laws. This method was superseded by another which introduced particulars first and, after they had been thoroughly examined, generalizations were formed.

The union of facts into generalizations is the organization of knowledge. (Spencer, H. "Intellectual Education." [1854] in Spencer [1861] 1966:49)

As Dunkel points out:

Herbart believes that a truly scientific psychology must ... begin with concrete particulars; otherwise it necessarily degenerates into a mere mythology which no one can take seriously. Unfortunately - and this is a crucial point - there are no obvious concrete particulars which can serve as material for a natural-history stage for psychology in the way that the collection of rocks and minerals can serve as a starting point for mineralogy. (Dunkel 1970:124)

The subject of psychology for Herbart was the mind (Geist), the representation of the soul which is "completely unknown and remains so forever" (Herbart in Dunkel 1970:123). Followers of Herbart, however, exploited this thought about scientific methodology to an extent that it helped to do away with metaphysics:

For the American Herbartians education is to be essentially cognitive, devoted to the general notions out of particulars, not the formation of the moral will, as it had been for Herbart. (Dunkel 1970:252)

(But we have seen how much every educator of this period was concerned with the formation of character, some more shyly than others.) Not all generalizations were accepted, of course, only the 'right' ones. Children discovered what they were supposed to discover. (Remember the German discipline?) Horace Mann said that the child comes to know particulars and recognizes resemblances among them but soon

[T]he number of individuals in each group becomes so numerous, that he wants a cord to tie them together, or a vessel in which to hold them. Then, from the nomenclature of science, he receives a name which binds all the individuals of that group into one, ever afterwards. It is now that he perceives the truth and the beauty of classification and nomenclature. (Mann 1844:122)

The "vessel" the child needed was given to him now just as it had been in previous times, but perhaps the ways of thought control became more hidden. When given a set of rules to investigate certain objects or phenomena instead of being provided with ready made information, one gets the impression of (a) a higher degree of freedom of thinking; and (b) an increased validity of information about the world. The problem is that scientific knowledge is valid only within its own bounds, bounds as limiting as those of religious knowledge.

We have seen that nineteenth century philosopher-educators did not consider knowledge or the content of education to be as crucial as moral nurturing. They were rather involved with the question of forming

character and attitudes. The omnipresence of arguments for the importance of science in education give the impression that it was control or moral education that really mattered in teaching science. Indeed "science is organized knowledge" Spencer wrote in his essay on Intellectual Education [1854] and the stress was on the word organized. There was little or no discussion of the content of science education; essays were written about the method and the organization of knowledge. Spencer summarizes the main points of the new, scientific pedagogy. Teaching should proceed

1. from simple to complex.
 2. from indefinite to definite.
 3. from concrete to abstract
- and finally:

4. the genesis of knowledge in the individual must follow the same course as the genesis of knowledge in the race. (Spencer: Intellectual Education [1854] in Spencer [1861] 1966:60)

I have argued that science was the nuts and bolts of the new system: science in educational philosophy and curriculum provided Victorians a solid, "natural" and "objective" framework of laws. In the following pages I will examine trends in school architecture and will attempt to answer some further questions on the educational theories of the late nineteenth century.

3. School Hygiene - The Common Denominator for the Schools of England, Germany and America

Scientific professionalism in school architecture emerged in New England. It was again Alcott who seems to have been among the first to have dealt with school buildings with hygiene in mind.

Health, as well as time, is money; and it is a most mistaken economy which confines a child to those arrangements, and to that atmospheric impurity, which render him unfit for vigorous effort, and thus slowly, though surely, impair his constitution: for we impose by these means a far greater tax on the parent, than would be necessary in erecting the most spacious buildings, and furnishing ample and liberal accommodations. (Alcott 1832:7)

A colleague of Alcott put it in a more poetic way:

Uneasy bodies render the mind uneasy and restless. Clear images of truth cannot be reflected from turbid and agitated water. (Woodbridge in Alcott 1832:37)

Beside the scientific explorations of the time on the nature of respiration, poisonous gases ** and the spread of diseases, there was a strong moral philosophical aspect involved that made ventilation and cleanliness a central issue in schools. One of the problems that was raised by Alcott (1832) was that while a child would be able to refuse

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 \*\* Educators scared each other and the public with spooky stories. One of the most favourite was the edifying story of the "Black Hole of Calcutta" (Alcott 1832; Barnard [1848] 1970; Woodbridge in Alcott 1832). In Calcutta 146 persons were kept in prison in a dark and airless cell. After ten hours there were only 23 survivors.

obviously poisoned food, he could not refuse to breathe poisonous air, i.e. he would not have a choice, he could not exercise his free will in the latter case. A more perilous circumstance for the moral philosopher was that "corrupted air" does not usually attack the body instantly. Moreover, the child would even not notice the presence of the smell-less, but highly destructive 'carbonic acid' which settles in the lower part of the room. The teacher knows about these dangerous factors so

[E]very pupil should be required, and, if necessary compelled to go out into the open air, at least once in an hour. (Alcott 1832:15)

The new element here was not that it made children do something that they do not necessarily like to do. The novelty was that this act of the teacher was explained and justified on scientific principles, so to speak, it was "objectively and scientifically justified". Perhaps the best example to illuminate the point was the use of thermometers in schools (Woodbridge in Alcott 1832). Doors and windows were closed or opened, the stove was kindled or the fire was put out not because it was cold or hot in the room. Cold and hot are relative and subjective sensations and it would have hurt democratic feelings if the teacher had decided on the temperature of the room. The thermometer solved the problem. An even temperature was maintained or even prescribed by physicians who had made experiments in

order to decide the optimum temperature for learning. It is not surprising that Spencer's naturalist view of education and society became more popular with the American than the English pedagogical community. Moreover, Spencer advocated moral doctrines about hygiene similar to those of the quoted American authorities:

[T]he preservation of health is a duty. Few seem conscious that there is such a thing as physical morality. Men's habitual words and acts imply the idea that they are at liberty to treat their bodies as they please. ... The fact is, that all breaches of the laws of health are physical sins. (Spencer, H. "Physical Education." [1859] in Spencer [1861] 1966:152)

Spencer comes to his conclusion after lengthy discussions on horse, pig and cattle breeding, diet and clothing, and the correlation between body functions and brain performance. The lines of scientific and religious thinking seem to have met in a common vanishing point. From Alcott (1832) to Hodgins (1876) it was usual to find statements like:

[V]entilation and cleanliness are not miracles to be prayed for, but certain results of common obedience to the laws of God. (Hodgins 1876:37)

From the 1860s the problem of hygiene in schools became central in all the countries in question. In the Anglo-Saxon countries (Britain, USA, Canada) it was ventilation that attracted the most interest. The purity of air occupied crucial and long chapters in the works of Robson (1874) and Hodgins (1876). Robson, the English

architect, was perhaps one of the highest authorities on school architecture. He was the chief architect of the London School Board and his 1874 book was the first profound study of school architecture. Modern authors also testify that health in schools played a central role in the latter part of the nineteenth century in England (Godfrey-Castle 1953) and Germany (Schmidt 1967). On the American continent the Canadian Hodgins' book did not win a prize for its originality but it is a good compilation of current ideas and designs of his age. He quotes the report of the Massachusetts Board of Health from 1873 which summarized the problems educators had to face.

"Without doubt the instinct of childhood is for frequent, almost constant, change of position and interest during the waking hours, and any steady occupation within a restricted space, may be fairly termed unnatural for children. But since they cannot have an "education" without some degree of violation of the normal conditions of childhood, it becomes of the first importance to maintain a constant, jealous watch over the health of school children, and to persevere in attempt to harmonize school methods and influence with the healthy instincts of childhood. Confinement, vitiated air, enforced quiet, prolonged mental effort, the use of the eyes on small objects in trying arrangements, are all, in some degree, conditions necessary to school, but threatening danger to the health of scholars." (Cited by Hodgins 1876:30-31)

This is the argument: There are certain characteristics of children that clash with the necessary conditions that prevail in schools (confinement, enforced quiet, strain on the eyes, etc.) but since schooling is inevitable, the

designer's task is to make the conditions of school "harmonize" with the "healthy instincts of children". This is why in Hodgins' (1876) own work ventilation received the utmost attention. He dealt with the question of proper lighting, however, at shorter length.

In Germany the amount of attention given to ventilation and lighting was just the opposite. For German educators bad air caused fewer headaches than lighting. Mann was horrified in his 1843 report by the conditions he met in Germany. He reported two great evils of Teutonic countries: "low ventillation and sleeping between feather beds." (Mann [1844] 1950:50). In schools he found no arrangements for warming and ventilating "on scientific principles". Hughes, some sixty years later, complained in a similar vein: "The ventillation is none too satisfactory." (Hughes 1902:73). We have seen in Chapter III that the illumination of classrooms from one direction emerged in the early part of the last century and became general by mid-century. Mann ([1844] 1950) said that pupils usually receive the light from their left hand side only. Later Robson (1874) and Hodgins (1876) wrote about monolateral lighting in German schools as a rigid rule. The already existing practice was justified later by theory, as has happened so many times in the history of education. Schmidt (1967) quotes the work of Grafe from 1850 (see earlier in this chapter) who was very specific about the necessity of left hand lighting. The

reasons were concerns about health. The theory was supplied by Zvez in 1864 and by Reimann in 1885 (Schmidt 1967), who both supported monolateral lighting. In the case of any other arrangement, Reimann argued, either the writing hand or the head and the body of the pupil would shade the paper, thus ruining the eye of the child. Because of the importance of lighting, German authorities established minimum standards for the size of the windows of classrooms. It was expressed in the ratio of glass surfaces to the floor area in one classroom. This ratio was 1:6 in Württemberg, 1:6.5 in Saxony, 1:9 in Berlin and Reimann suggested 1:5 as to be ideal (Schmidt 1967:194). The size and the shape of schoolrooms, which had been the result of a long tradition, was justified on a scientific basis:

"As a rule it may be laid down that the scholar (if his eye be in its normal condition) can read writing on the wall at a distance of 27 feet. The length of the classroom, therefore, might be 30 feet. The breadth should not be more than 21 feet, because then pillars or complicated construction are required. ... A large classroom should be rather oblong in shape and not less than thirteen feet in clear height." (Minister of Education of Prussia in Robson 1874:84)

Schmidt (1967) cites other authorities on the subject whose words were similar to the above.

Science in the form of school hygiene proved to be an excellent tool in the hands of educators all over the world. By referring to scientific principles, one could defend the need for uniform designs in Germany or by putting into

consideration some other but not less scientific laws, one could support the professional authority of an architect in England or in America.

#### 4. General Characteristics of School Buildings

In the second part of the century the surroundings of school buildings received considerably more attention from architects than ever before. Hodgins enlists the must-nots in elevating a house for education:

- [I]t should have a pleasant situation, not on the highway, nor be near noisy factories, distilleries, or pork-houses. Nor is it advisable, for many reasons, to place it close by the burying-ground. (Hodgins 1876:11)

This list was recurring with minor modifications in English (Robson 1874) and German literature (Schmidt 1967). Dust, noise and the danger of exposing children to moral vices were listed on the same page. The school building was supposed to be built on a dry, handsome and large lot and:

The site must be accessible, and should be as nearly as possible central. The centre of population, as well as the geographical centre, needs to be considered. (Baldwin 1885:21)

This latter requirement was obviously the result of a professional and ~~state~~ administered educational system which divided the population into districts (The first attempts to design according to school districts were made by Horace



Mann - see Mann [1844] 1950:119). An even stronger emphasis was put on the outlook of the buildings. In America rich ornaments were defended on the grounds of the well known thesis of the relationship between sensual experiences and morality. Hodgins quotes several authors on the subject. The most arresting argument was presented by Rev. Dr. Ryerson:

"It is highly desirable to remove, as far as possible, all obstacles that interfere with the education of youth ... If the school-house should happen to be the meanest house in the neighbourhood, the impression of the children attending it would naturally be that it was one of the meanest things in the world to attend school; where if the school-house is neat, elegant and attractive, as it should be, the impression fixed in the minds of the children would be that school was a place of power, influence and importance." (Cited by Hodgins 1876:9)

Later a quotation from the Illinois Teacher draws the following conclusion:

"The moral character of a school and their fitness as teachers are indicated by the moral character of the building and its premises." (Cited by Hodgins 1876:11)

The "moral character" was favourable if the school was well situated, the grounds were ample and covered with trees, bushes and flowers, and the building was not only well constructed but nice and clean. A poetic correspondent of the New Hampshire Journal of Education wrote "Let 'beauty and utility dance together' always, when they will." (in Hodgins 1876:13). Plates IV/17,18,19 illuminate the meaning

of "beauty" in this context. The previously used Greek and Gothic revival style has been replaced by eclecticism, especially so in the case of Bicknell's plans (1878) (Plates IV/18,19) which had a facade that could have been built in any of the Western cities of that time. In Plate IV/20 an earlier design is presented and it is apparent how much more modest it was.

In England utility still took the lead in its "dance" with beauty. Plates IV/21,22 show a relative austerity compared to the American fancy. The style, however, was not less eclectic - see Plate IV/22. Perhaps it is needless to say that the motives behind the style were ideological.

The attempt to substitute an ephemeral show of cheap ornament, at the sacrifice of what is actually necessary to sound construction and efficient arrangement, in the introduction of inferior materials, in imitation of those of greater value, has produced a false and unreal system, which is as much to be deprecated in the building of a school as in a Church. Everything ought to be real - truth should be taught as well in practice as in theory - and the child, who learns the first rudiments of his Christian walk from the mouth of his schoolmaster, ought to feel it has been carried out in a place where he is taught; the senses should not be deceived by a fake and unmeaning show, which in time is sure to throw off the disguise. (Clarke 1852:6)

Interestingly enough it seems that fake ornaments were used first by American architects. "Honesty" which was to become the password for architects in the functionalist 1920s, had been a crucial point for the conservative Victorian architect. For Americans of this time a building was

supposed to be pretty in order to be considered as being "moral", while for the British it had to be modest and honest.

In Germany authorities encouraged architects to design school buildings to carry "characteristic distinctions due to their purpose" (Schmidt 1967). From the late 1850s city schools were richly ornamented (Plates IV/23,24). The Schulkasernen (school barracks) name gradually changed to the well deserved Schulpalast (school palace) (Schmidt 1967:184). Rural schools in Germany remained modest and home-like (Plates IV/25,26). This rural style seems to have been the basis for the Heimatstil of the 1930s. In the second part of the century in many Western countries, governments made recommendations, drew up model plans, and supervised design work. Robson wrote:

In Germany this is done systematically, and even the private schools are not exempt from state interference. ... In Holland also a building cannot be used for school purposes, public or private, without an inspection and certificate of fitness. (Robson 1874:8-9)

The plans issued by government offices were not compulsory, they were suggestions. The first model plan collection was the 1806 and 1809 "Düsseldorfer Normalplänen" (Schmidt 1967). Later in 1836 (Württemberg), 1871 (Schleswig-Holstein), 1873 (München) and 1895 (Prussia) model plans, or detailed written descriptions of desirable constructions were issued. The growing number of suggested

plans show a significant correlation with the development of central administration.. Most of the "Musterplänen" were made after 1871, the year of the establishment of the Second Reich. We have already seen that one of the chief activities of the Committee of Council in England was to produce designs not to be followed subserviently but to be applied in principle. Grants were allocated by the Committee as early as 1839 on the condition that the:

[B]uilding in its general character must comply with certain rules of the Committee as certified by the Committee's inspectors. (Hughes-Klemm 1903:30)

Prototype plans were required by the 1870 London School Board design competition - the result was the famous Ben Jonson school which opened a new era in English education with the Education Act in 1871. In America there were several suggested plans but they all were "unofficial". Their purpose was something like a Sears catalogue - offering the prevalent fashion at moderate prices. It was even emphasized that:

Given plans are suggestive, but are never to be copied. Individuality and originality should characterize the educational nurseries of the race. (Baldwin 1885:22)

Stock-plans were not yet issued in the United States at this time but in the first years of the new century professional government control was evident:

As the need of increased education pressed more

heavily upon the local community, they began to turn towards the central power, the state, for help; and the principle of state help and control has gradually become recognized as possible in America. (Hughes 1902:131)

School board members and supervisors of schools became appointed rather than elected by the people. Elected bodies were replaced by paid experts in order "to remove the school from the effects of popular caprice and change" (Hughes 1902:133).

## 5. The Internal Arrangement of Schools

### England

Far-reaching changes happened in England. By the 1860s plans appeared to be more compact than previously they had been. The design suggested by the Education Department (founded in 1858) in 1863 was considered to be a milestone both by contemporaries and modern authors (Robson 1874; Godfrey Castle 1953) (Plate IV/27). An interesting feature of the plan was that it allowed for the teaching of boys and girls together, and for the teaching of young and old separately. The school included teacher's apartments, classrooms and an unusually shaped school room. The school room had an uneven T-shape - most inconvenient for the customary English teaching and supervising practices. It seems that each class was not only separated by curtains from the rest of the school but that they were

classroom units corresponding with corridors. Robson's (1874) design eleven years later utilized the same idea (Plate IV/28). The school had three classrooms (two could be opened into one by pushing back a sliding wall marked "E"), "A", "A" and "B", and a school room, "C". The school room was divided into three parts by curtains, each unit containing three parallel rows of double desks. The classrooms did not have galleries and were furnished with the same type of desks as the school room. The differences between what were originally two different functional units, the classroom and the school room started to vanish. In front of the classrooms the empty space used originally for recitation or draft work has now turned into a short corridor and part of the stairwell ("D").

The breakthrough came in 1872 when the above-mentioned Ben Jonson Street school was built in London. The design in Plate IV/29 may be compared with a groundplan made in 1840 (see also Plate IV/7) in order to throw some light on the line of evolution of school designs in England. The significance of this comparison lies in the argument I have presented previously, that English educators might have visited Germany but their thinking was autonomous. The development of school class system in England was the result of long evolution and was not imported from Germany. The theoretical importance of the new developments lies in its new approach to architecture and to educational philosophy.

As the old educational theory held the view that the teaching of rules and laws was superior to presenting particulars, so operated the architect: Lancaster designed a huge barn, filled it with strict rules and tried to fit the individuals into it. Professor Roger Smith, the architect of the Ben Jonson school, designed units for children (1,600 altogether), separate classrooms and a central hall and then molded them into a whole. Probably his concern was "how to arrange parts in a manner sufficient for learning" - a scientific idea.

Further examples of the new "school board architecture" or "central hall system" are in Plates IV/21 and 22. The plan of the Haverstock Hill school (Plate IV/22) is marked by its unusual groundplan. The "girls' covered playground" was practically the central hall for the school. A remarkable addendum to the previous plan was the teachers' room. In Plate IV/21 the New North Street school represents a more sophisticated design. The three departments of the school were on different floors. To the central hall on the first floor a gallery was attached running around the second floor. The boys' school rooms were separated from the hall by sliding partitions. Sliding partitions, which were always glazed, separated the hall from classrooms. Robson wrote about the advantages of the central hall system:

By this plan the expense and wastefulness of corridors is avoided, time in management is not lost

because of the straggling inconvenient position of rooms, and easy supervision is secured, for the principal teacher can see at the same moment what his assistants are doing at both ends of the rooms, and each of these, in turn, can observe the progress of his pupil-teacher's work through the glass pane in the sliding partition. (Robson 1874:199-200)

This mention of the (principal) teacher supervising his lesser colleagues reinforces my argument concerning the change in the role of the master. He became an administrative supervisor rather than a "shop floor" teacher.

#### Germany.

The changes in German school architecture as well as in pedagogical theory were minor in the latter part of the century compared to those in England. There was a slow shift from rural one-room school houses to big town schools which were the descendants of the former. Large city schools were built but they differed from the town schools of an earlier period. An 1840 design in Plate IV/30 reflects the change in attitude in comparison with the plans in Plates III/6,7. While the Schwelm school was constructed by putting compact little schools side by side, the Hamburg design shows a similar kind of unit- or modular thinking to the contemporary English plans. Individual classroom or boarding units were connected by a corridor. "It is the class, not the school, that is the unit of school



administration." (Hughes 1902:79). On the top floor there was a huge hall for 'public events', the 'archives', the room for scientific collections which acted as a conference room as well, the carcer which was a tiny jail for misbehaving pupils, and a spare classroom. Clearly defined functional distribution of spaces can be observed: the basement level was for the boarding pupils, the first floor served as the main zone of teaching and the second compiled all the administrative functions of the school. The 'archives', for example, was essential for bureaucratic authority. The conferences, held in the room where scientific collections were displayed, were closed professional meetings of the teaching staff. Collections, as the symbols of knowledge and power, were closed into cases and put near to the teacher's place elsewhere too, for example, Alcott (1832) and Mann (1838) designed these closets behind the teacher's desk, on the platform. The carcer was a German invention for the "youths doomed to the reflection and meditation produced by solitary confinement." (Robson 1874:117). Finally I considered the hall to be an essential component of authority because:

This room, or aula, being used only some three or four times a year - viz., at the great examinations, or on the occasions of a fete like the Emperor's birthday. (Robson 1874:80)

These new features indicate a change in the ways of control in Germany. The paternalistic 'father-helper' image has

given way to a rather impersonal authority. One might say that the slow disappearance of the familial-type control was the result of urbanization and consequently of bigger schools. Partly this was the cause but rural school building patterns changed by the end of the century as well. The "homely atmosphere", as Hughes (1902) put it, was still prevailing but, for instance, the "Atlas" attached to the Prussian Denkschrift (1895) contained designs where the teacher's apartment was separated completely from the school, unlike previous practice (Plates IV/1-d, 25, 26). Schmidt (1967) assumes that this was one definite difference from earlier plans. His point is supported in the cases of IV/1-d and IV/26 rather than in Plate IV/25 but in all examples we find separate entrances to the apartments. In theory this separation had (what else?) sanitary reasons: in this way diseases could not spread from the teacher's family to the school children (see Denkschrift 1895 in Schmidt 1967:174). It is obvious too, that almost identical functional units (classrooms, or in Plate IV/25 even the teacher's two living rooms) were organized according to an ordering principle. This principle in the English schools was represented by the central hall; in Germany its place was taken by the corridor and the stairwell. While Robson (1874) expressed his distaste for long corridors, Germans seemed to be obsessed by long parallels meeting at a vanishing point. This was particularly true after the

"General regulations concerning elementary schools and the training of teachers" in 1872 gave a green light to schools with several classes and thus halted the further decentralization of the system (Paulsen [1906] 1908).

The plan of a parish school (Gemeindeschule) in Berlin (Plate IV/31) shows the structure of the governing architectural idea. On the basement floor there were the service facilities, including the caretaker's room, who, as we will see later, became a crucial figure in school life. On the first floor there were the reserve and the lowest classes (in Germany classes went from 6 to 1). The principal's (Direktor) apartment was situated here too, but it occupied an isolated wing of the building. He was not disturbed by the noise of the school but he could not supervise the activities of children, or that of teachers either. The two higher storeys were occupied by classes in a growing sequence so that pupils actually got closer and closer, year after year, to the (final) examination hall on the top floor. The different floors were connected by two sets of stairs and landings with adjoining teacher's rooms in strategic positions on almost every floor. The plan, however, lacked the perfection of later designs because there was no "checkpoint" on the entrance level and a "store" on the second floor took the place of a teacher's room. The Wiesbaden plan in Plate IV/32 corrected this flaw. (This plan was of a Höhere Bürgerschule which was, in

fact, a high school. I present it though because functionally and theoretically there were no differences between elementary and high school buildings in Germany.) The entrance was monitored by (the room of) the Pedell, or the caretaker. He was a new phenomenon.

[T]he pedell, translated as caretaker really combines some of the functions of a proctor with those pertaining to the charge of the fabric. To him, is committed the task of executing punishment on the refractory... (Robson 1874:116)

He was also in charge of locking the carrer and of time-keeping by operating the hand or later electric bells. The administrative power line has been extended and has also been separated from the professional departments - a typical pattern of strong and independent bureaucracy, as we have seen in the case of Prussian military in Chapter III. Here the principal was placed on the top floor (quite opposite to the English practice where the head master supervised his teachers personally through glazed partitions) and from there, from behind the scenes, he directed the relatively autonomous professionals (teachers) who worked in separate and independent units (classrooms). He also directed a parallel, if very short, hierarchy of executive administrators. At this time no secretaries and other administrators helped his work, only the Pedell. The Pedell or the Schuldiener has taken the place of the patriarch teacher. A characteristic story was quoted by Klemm. He

visited a school in Hamburg and

When the geographical part of the lesson was well disposed of, the teacher gave a new zest to the pupils by asking, "To whom belongs the theatre, the school, the bridge," etc.? ... It caused a merry interruption when a little boy thought "the school-house belonged to Mr. - (the janitor). (Klemm 1903:14)

The boy was apparently deceived by the caretaker who was acting as if he had been the owner. Although in English schools the caretaker had much less importance and authority Robson suggested situating his toilet so as to "adjoin that for the children, to ensure the necessary attention to the latter." (Robson 1874:216). By the end of the century the head master's apartment completely disappeared from schools and the "vacancy" was filled by the caretaker. In Plate IV/33 the caretaker's apartment was situated in the core of the building just beside the office of the head master (Direktor). Here was the hard core of the system: on the different levels it contained the rooms of the teachers, a "study room" and science laboratories, and the hall. These plans, however, like the one in Plate IV/34, were also examples for unit planning. In Plate IV/33 the identical wings were not even drawn on the higher floors, only the middle section (Mittelbau). In Plate IV/34 a very up-to-date plan is presented, an arrangement which has recurred in the twentieth century. Classrooms were situated on both sides of a corridor while sound isolating units

(stairwells, closets etc.) were inserted between them. The gymnasium, also a new unit, was attached to the main building by a short and narrow closed corridor.

It is worth mentioning that the latter two designs were typical in German cities because Hughes (1902) characterizes the new Berlin buildings as having wide corridors on each floor running into aulas or landings, with subsidiary rooms, like the director's and teacher's rooms, the museum and the library, being designed in one compact unit on the highest floor.

### America

At this time rural schools in America showed much the same picture as they had when Alcott or Mann designed their schools some fifty or sixty years before. Hodgins' (1876) plans (Plate IV/14) are just two of the innumerable similar designs suggested by him. The development occurred in the city schools. Until this time, town schools had been designed either on Lancastrian patterns or they had been akin to rural schools. In the third quarter of the century new solutions were put forward. Class teaching methods became increasingly popular. E. McV. Moore wrote in the Pennsylvania School Journal:

"It is clearly impossible for any teacher competently to instruct more than forty or fifty pupils in the six hours usually allotted to them. Never let the

school-room be crowded with so many pupils that each one cannot receive adequate instruction." (Cited by Hodgins 1876:38)

The interesting characteristic of these new plans was the great number of sliding partitions and hence the increased spatial flexibility (Plates IV/19,20). It is also remarkable, having German schools in mind, how inferior a role was given to corridors and stairwells in structuring space. Actually their number and size was reduced to a minimum. The hall in American schools was mostly for traffic distribution. In most cases it was subdivided by partitions to make more teaching spaces. The school building was highly efficient - efficiency meant the highest possible exploitation of floor areas and teaching time. Square feet and cubic inches played an important role in designing. Behind the lavish facades everything was designed to be optimal - in size, in shape, in material. The underlying principles for determining the size of spaces was scientific. Ventilation, as we have seen, played a central role; calculations about the amount of air needed for each child were supported by the well-known medical examples of the effects of bad air on body and soul. Hodgins quoted two edifying poems on the subject (Plate IV/35) giving an excellent example and a good account of the educational thinking on the "shop floor" in late nineteenth century America. In order to provide good ventilation numerous mechanical inventions were suggested, some joined

with heating systems. One of them was to build high towers with an open fire (lamp) burning in it, so to produce the necessary draft. This is another good example of "hidden functionalism" in design: the richly ornamented steeples in Plates IV/17,18,19,20 hid a vital part of the building. The design in Plate IV/36 shows the floor plans of the five storeys high Girls' School in Boston. It was a little higher than the average four floors high town school (Hughes 1902).

Departments are measured by the seating capacity of the seven large class-rooms, each having 100 single desks, making a total of 925 in these departments, which, with the 300 in the model school, makes a grand total of 1,225 pupils. (Robson 1874:44)

The plans exemplify the general tendency to keep the area of non-teaching spaces (mainly corridors, landings, stairwells, halls) to a minimum. The design consequently lost the solid order of symmetry that had prevailed in previous plans. The floor plans look almost incomprehensible compared to their German or English counterparts because they are so compact. We can see here the first efforts toward modern "envelope" design: the limits were given by the outside walls and the cores of stairwells, halls and airflues but otherwise the design of each floor was different. The order that organized the space was less overt than in either the German or the English schools. In the former case the "order" was embodied in corridors, in the latter it was reified in



central halls. In the Boston school "Electric bells and speaking tubes place the master's room in communication with all the principal rooms" (Robson 1874:44). This is the American way! While in Germany official orders and circulars seemed to secure authority and in England the system of tubes was called by Bentham "hearing tubes" (See: Chapter II). In America control took a new quality with the issuance of statements and the pacing the evolutions of the school personally and yet impersonally at the same time. Something that was said through the tubes was personal in one sense because everybody knew that it was said by the head master but it was impersonal compared to an everyday morning address in an assembly room. So was the case with the electric bells - it was, of course, known that the principal operated it, but in daily practice the ring of the bell was as impersonal, or so to speak, deterministic and 'natural' as sunrise or sunset.

## 6. Summary

In this chapter I have argued that there were converging tendencies in school politics, educational philosophy and architecture in the late nineteenth century England, Germany and America. The general trend, the thread of thinking in all of the above aspects of education was to provide the system with a scientific justification and to bring about an

increasing, if more subtle, form of control. Science in education, being universal, consequently resulted in similar systems of thought creating a solid basis for twentieth century "international-style" education. Another important trait of this era was the increasing government intrusion into education. By making education compulsory and free it became a necessary and unquestioned part of social life. Debates were no longer about the necessity but the best possible methods of education.

Scientism, as a way of control, had two major effects on school architecture. One was the substitution of traditional analytical space organization by a new unit-oriented arrangement. Classrooms or class units became the modules of planning and the school building became the result of the arrangement of these with other auxiliary units. As rule-teaching was superseded by the observation-generalization method, the barn-like space disappeared and corridors and halls sprang up instead, linking classrooms. Scientific tabulation of data suggested that their relationship to each other was objective and "natural" (e. g. Mendeleev's periodical system of elements or Darwin's contribution to biological systematization). In school building design relationships between distinct and specific spaces became the primary issue. At the end of the nineteenth century school architects' main problem was how to arrange the unquestioned units of teaching most

efficiently.

Besides the similarities in the philosophies of some of the Anglo-Saxon authors and German writers the national differences in school building designs indicate an autonomous evolution of educational theories. Philosophers and architects of different cultures started from various cultural backgrounds but arrived at an international "agreement" in the last decades of the nineteenth century. "Every school is a machine deliberately contrived for the manufacture of citizens. The die of the machine varies" (Hughes 1902:4). The next chapter focusses on the rise of modern educational theories in school architecture.

## CHAPTER FIVE

### Modern Schools, 1900 - 1950s

In the first part of the chapter I will give a short account of school building between the turn of the century and the end of World War II. This period of some forty years was characterized by various, sometimes divergent experiments in school architecture. These experiments did not, however, influence the basic trends in school building theories and practices. I argue that the importance of this era lies in the difference between the still waters of pedagogical thinking in school design theory and the stormy seas of changing educational philosophies. The paradox of the new philosophy of progressives and the relative traditionality of school designs is examined in this section.

Further on I will analyse the post-war tendencies by giving an account primarily of American developments. In the 1950s the specialization and diversification of curricular subjects reached its peak. Consequently spaces in school buildings became more and more specific and

articulate, providing special space allocations for each and every function. This development carried the germs of an upcoming educational crisis.

#### 1. Pedagogy and School Buildings Between 1900 and 1945

The twentieth century saw some predictable changes in the functions of schools brought about by the growing professionalism of education. The development, in short, was the accelerating differentiation of the organization. An organization's degree of differentiation can be measured by the number of branches, number of occupational positions, and the number of hierarchical levels and horizontal divisions. Especially after the First World War, in almost every developed country efforts were made to create a homogenous and uniform system of education at the lower levels. Elementary schools were reorganized in England and the United States and the concept of Einheitschule (the unified school) flourished in the new Weimar republic. At the same time, at the secondary level, various kinds of institutions burgeoned. The basic idea was to provide every child with uniformly general elementary education so as to establish a sufficient pool of recruits for higher education. It was believed that in this way every individual's place in society would be not only efficiently but justly assigned by the school. A 1928 bulletin issued

by the Board of Education in England, stated the problem to be

[T]hat of the adaptation of the existing elementary school system so that all the older children, not a selected few, may receive an education suited to their age and special needs, practical in the broadest sense and so organized as to allow for classification between pupils of different types of capacity and different aptitudes. (Kandel [1933] 1970:109-10)

The administrative homogeneity of elementary education was counterbalanced by great diversity in curricula. While a hundred years before only the 3Rs had been taught, in the first decades of the twentieth century an extensive variety of subjects was on the menu of primary schools. As a combined result of growing administration and scientism in education, the curriculum of elementary schools became more complex and sophisticated than it had been before. Natural sciences gradually took the place of dead languages (Latin and Greek). In the U.S., for example, Latin enrollments dropped from 50% of all students in 1905 to 27.5% in 1922. Other highly 'theoretical' subjects were under attack as well: in 1905 58% of all secondary school students took algebra while in 1922 only 40% favoured the subject (Nasaw 1979). The ideology behind the rapid decline of academic disciplines was bluntly expressed by a contemporary:

"Where does trigonometry apply in a good woman's

life? Will it contribute anything towards peace, happiness, and contentment in the home? Will it bake any bread, sew on any buttons or rock any cradles?" (Cited by Nasaw 1979:142)

The obvious result was an increase in semi-vocational subjects in schools; these were the "practical subjects". They were, of course, no more practical than algebra or anything else. Actually algebra might have been more practical in a sense, since the number of administrative employees in manufacturing industry grew by 330% between 1899 and 1929 in the U.S. while the number of production employees in the same area increased by only 90% (Nasaw 1979). This fact suggests that the implementation of "practical subjects" was driven by ideological motives rather than industrial-economical reasons. The nature of these motives will be discussed later..

This diverging range of curricular activities resulted in specialization of spaces as well as functions. While academic subjects could have been taught in almost any classroom-like space, natural sciences and practical education, not to mention physical training, required specialized spaces such as laboratories, workshops, home-making and kitchen areas and gyms. Also, naturally, the staff became more and more specialized and the more complex the educational machine became, the more sophisticated was the administration needed to run it. Increasing articulation of organization resulted in

distancing of authority; and the need to develop a management system, a line of authority.

School architecture reacted sensitively to the new currents of energy which pushed design practice with increased speed on the tracks already laid at the end of the nineteenth century. Specialization was not new in itself; what was interesting was the degree and the speed of it. In the following I will examine closely the effects of these quantitative changes in education on school architecture.

## 2. Hygiene: Doctoring Society

As we have seen, the major factor in school design at the turn of the century was hygiene. Seaborne and Lowe (1977) devote a whole chapter to the topic under the title "Medical influence on school design 1902-1914". Health in schools became the primary issue partly because of growing scientism in education and partly because it supplied an international phraseology for the new-born world community of educational scholars. Conferences on school hygiene in Nuremberg (1904), London (1907) and Paris (1910) were the landmarks of this movement. There was also a growing belief that curing physical illnesses would result in healing social injuries. The underlying principle of connecting bodily and mental or spiritual health was ancient. In England the Provision of Meals Act (1906) allowed LEAs to



provide meals for "necessitous" children and another Education Act (Administrative Provisions) in 1907 prescribed compulsory medical inspection in state-supported schools.

Between 1900 and 1930:

Educators, psychiatrists, social workers, and penologists saw themselves as doctors to a sick society, and they demanded the broadest possible delegation of medical authority in order to heal it. The medical profession, they claimed, had learned to prevent disease rather than simply relieving its symptoms... (Lasch 1977:15)

Penology and pedagogy were together again. Guizot's maxim, "Open a school and close a jail", gained credit, so became fashionable the English educational proverb: "We must now educate our future masters". The stubborn belief in the power of education as a preventive force to social ailments persisted. The architectural expression of the idea was the open-air movement. Open-air schools were single storey buildings with completely isolated classrooms. At least two sides of each classroom were composed of sliding-folding glazed screens (Godfrey-Castle Cleary 1953)... The arrangement was devised in order to provide the students with more fresh air.

They catered initially for tubercular and undernourished children, but within a few years it became usual to categorize children as delicate, physically defective or mentally subnormal and to organize the open-air school in three separate departments. (Seaborne-Lowe 1977:81)

The first school of this kind is thought to have been built in Charlottenburg (Berlin) in 1904 (Seaborne-Lowe 1977). The effects of the Great Hygiene movement on school architecture were (1) building single storey schools, (2) partial abandonment of the central hall system which did not allow sufficient cross-ventilation, (3) the planning of long (marching) corridors. Buildings stretched out wide on spacious grounds and some schools occupied more than one building by using the so called "pavillion system" (Plate V/1). Pavillions were used first in Germany in the late nineteenth century. They were called Schulbarracken (not to be confused with the Schulkasernen) and were the result of hygiene as well as open-air schools (Schmidt 1967). Nevertheless, between the two World Wars it became clear that poverty and juvenile delinquency could not be successfully fought by providing children with more and more fresh air, not even by making them sit, lie and sleep on open verandahs.

### 3. The Development of the Network-School

Village school houses still looked and functioned akin to those one hundred years before. They became a little less austere in Germany and a little less lavish in the United States (Plates V/6,7) but the general outlay with the frontally arranged classroom in the center remained the

same. In the German 'gingerbread huts' (Plate V/6) the teacher's apartment was secluded on the second floor but he was provided with a little teacher's room (it was reserved for teaching materials - Lehrmittel) on the first floor thus splitting the personality of the educator into the Kantian private and public spheres. The impact of pedagogical progressivism can be detected in Plate V/7 by the presence of a kitchen, the space named in characteristic bombastic phraseology, "domestic science" after the subject that was taught there. It was significantly different from the kitchen of the German plans in Chapter III for those were in the service of the teacher only. The teacher's room and the adjoining library were traditional since the early nineteenth century - the library sometimes as only a bookcase but still recognizable as a functional unit. Now these space fragments became specific and monofunctional units. The modern rural school room was equipped with single desks or moveable tables and chairs in order to provide space for community activity but I have not found any examples of alternatives to frontal arrangements.

The important change in attitudes was that although the adequacy of a school building was measured by square footages and lighting indicators, it was at this time that newly built schools came to be considered better than those that had been built some time ago. Until the 1910s one school design was preferred to another, or professional

planning was argued to be superior to the work of a country bricklayer - the distinction, in short, was made between good and bad constructions. But now the concepts of good and bad were replaced by the new and old (or traditional) still indicating the adequacy and not the proper age of buildings. A school that was "new" was by implication "good" also. Evaluations of the old schools started to become "aggressive and derogatory:

It is scarcely possible to imagine a more unfortunate environment for the formative mind of the school child than that presented by the traditional country school. (Barker 1918:176)

The use of the new phrases, like "formative mind" sounded very up-to-date and scientific and were almost enough to be convincing in themselves. Townroe's evaluation of the London schools had even a political tone:

[Older schools] especially those belonging to religious denominations, are already condemned as unsuitable for modern needs, and even as unsanitary. (Townroe 1926:569)

While open air schools only constituted a moment in the history of education and school architecture, parallel to the hygienist movement there developed another kind of school building theory. Big schools were built, mostly in cities, equipped richly with special facilities like workshops and labs, art rooms and gymnasiums etc. In

Manchester, the Varna Street Board School, for example, was built for 2,000 pupils in 1900. It had special facilities and not less than six staff rooms. Separate provisions were provided for the head and his assistants as signs of growing isolation of administrative authority from professionals (Seaborne-Lowe 1977). The highest authority on school architecture at that time, Felix Clay, favoured the big, multi-storey buildings. He emphasized that

In the position of the school it is well that the approach to it should be carefully considered, i.e., with regard to shops, mews, public houses, or factories that the pupils will have to pass. (Clay 1906:32)

The kind of education Clay had in mind while designing his schools reveals itself in the way he positioned classrooms:

The strain upon the voice of the teacher in a class-room looking over a street is very great, and is likely to result in injury to the throat. (Clay 1906:32)

Education was looked upon as lecturing students in classrooms. Clay committed himself to the traditional British course of school architecture which required clarity and rational simplicity in ground plans in order to provide teachers with an efficient building that could be supervised at ease. He wrote:

[I]t is essential that there should not be long narrow corridors, awkward staircases, and dark corners, for, unless the classrooms are easily accessible, there is not only a great waste of time, but a considerable likelihood of disorder, as, where supervision is difficult, discipline is not unlikely to suffer. (Clay 1906:18)

Despite Clay's efforts it is likely that Silverthorn (1954) was right in claiming that in a typical 1910 school, one third of the total square footage was used for corridors and stairwells. (Plate V/2). Efficiency was intended to be increased in new ways. Clay earned a special fame with a quasi-functionalist approach he took in 1910.

In a remarkable, and probably unparalleled, experiment, children of differing size were put through various drill routines to determine 'the maximum number ... it is possible to put into these rooms and to exercise with reasonable effectiveness'. (Seaborne-Lowe 1977:69)

In spite of all the debates on the necessity of corridors, sufficient amount of air and square footage for the students' needs, and the beneficial characteristics of halls classroom organization gained monopoly and correspondingly corridors and halls joined the isolated units. It did not change the course of the everyday theory and practice of education whether there was cross-ventilation or bilateral lighting. Neither was there any significant difference between an English or a German city school. (compare Plates V/2 and V/3). Architects who tried to break the

'school-loaf' into an angle (Plate V/4) were reckoned as adventurers. George Widdows, an experimental English architect, tried to break away from the strictly "rectangular" approach by arranging classrooms at arbitrary angles so to make the building expansible. He also invented a more open plan (Plate V/5) which was rediscovered and favoured in the 1950s under the name of "Open double-banking" (Stillman-Castle Cleary 1949). At this time there was significantly more attention paid to the freedom of the child, his or her development and interests.

The general arrangement of schools remained bound to a few patterns: quadrangle, L- or U-shapes, a few linear constructions - a phenomenon which indicates that partly due to the uniformization of educational theory designs of schools tended to be uniform as well. Designs in Plate V/8 (Walton Hall School) and V/9a,b show identical cloister arrangement. Seaborne mentions one reason why the central hall became unpopular:

In most schools of this type which are still in use the glazed partitions have been covered with large sheets of paper by the teachers, whose desire for privacy has grown ever greater since about 1900. (Seaborne 1971b:26)

One might think that this was the natural consequence of having employed more and more qualified teachers whose professional pride might have been hurt by constant

supervision. But this was probably not the case as later Seaborne reports about the dissatisfaction with quadrangle and courtyard plans.

The walls facing into the quadrangle had a great many windows in them so that everyone could see into every other room at all times. ... One could not be experimental and fail without every other child and member of staff knowing about it. (Seaborne 1971b:44)

This suggests that professional training increased instead of decreased uncertainty, and gave rise to fresh fears of failure in teachers. Time schedules, curricula and methods were usually not prescribed by central authorities. Local boards or even schools were responsible for the internal of the schooling process. Since teachers were trained professionals they were expected to experiment on their own, yet they could not afford to fail because failure implied incompetency. It was this dread that made teachers long for 'privacy'. Privacy was needed, an isolated classroom where one could go through hours of drill and rehearsal before the real performance in front of the public or a supervisor.

The three L-shaped American designs in Plate V/10 seem to show a trend toward open planning with self-contained units. Schools which were built in this 20-25 year period were remarkably uniform. This is also an indicator of growing control, of bureaucratization since uniformity was the result of newly established professional standards. The



idea may have been to build individual buildings to fit each and every unique place and program but they all turned out to be similar mainly because strict regulations restricted the selection of sites and educational programs were more or less the same all over the country. In Plates V/11,12 there are a few by William Ittner, the American school-specialist architect's designs. Although Study hailed the developments with enthusiastic words,

Perhaps no type of building in the United States was first so completely revolutionalized within the past two decades as the public school. (Study 1925:97)

- it is difficult to agree with him. New schools were seen as developments compared to antebellum woodshed schools. Bad examples of the old days were contrasted with contemporary model buildings. The "traditional school of our forefathers no longer fits modern needs ..." (Study 1925:97). But, in fact, Ittner's schools, these "splendid civic monuments", did not differ in their general layout from the late nineteenth century central hall schools or the Schulkasernen. Although on a general level no revolutionary innovations can be detected, the internal design of the schools showed little but important changes. In Plate V/13 the arrangement of desks and blackboards shows no variety. The softening of the traditional school started in the infant department or kindergarten where seats were arranged

in a circle and along the walls, folding partitions (not a novelty though) allowed large and medium size group activities, and inclusion of a toilet in the teaching area provided the possibility of a self-contained environment.

In general single-storey buildings won over compact highrises. 85% of the English schools built after 1924 were single-storey constructions (Seaborne-Lowe 1977). Budget cut-backs and sky-rocketing construction prices forced architects to look for economical solutions. W. T. Curtis in 1931 could reduce costs by 30% by using steel frame and brick walls. He built flat roofs and reduced ceiling heights which led to the use of wider windows and gave a horizontal appearance to the building (Seaborne-Lowe 1977). The 1944 Wood Report on "Standard Construction for Schools" in England in its first approach suggested a rather compact, symmetrically balanced and integrated building. In the Committee's second approach they used a more open and flexible design, a 'finger-type' plan which was consistent with platooning (Stillman-Castle Cleary 1949). Architects of the architectural 'new-wave' like Dudok, Lucrat or Schumacher

[Worked in reinforced concrete, using large expanses of glass and strong horizontal lines to capture the spirit of contemporary factory design. (Seaborne-Lowe 1977:125)

Not everybody liked this new development. Americans

complained, that schools were repellent and that "They painfully resemble factory buildings." (Eberlein 1922:199). Interestingly enough, while the Bauhaus and the functionalist movement had such an enormous impact on city planning, industrial and dwellings design, it left school architecture almost untouched. The reasons probably lay in the fact that school architecture in its ideology presented the ideas of functionalism well ahead of the general architectural trend. Functional zoning, unit design and strict biofunctionalism (hygiene) had all been living practices in school design before the Bauhaus. Flat roofs and ferroconcrete did not result in new functional elements or arrangements, so hard core pedagogical traditionalism and "revolutionary" architecture fitted each other well. Drew (1970) also suggests that educational progressivism and architectural development evolved separately for almost fifty years.

#### 4. Control Shifts from Dictation to Stimulation

I think the main reason for uniformity lay in the forms of control exercised by the educational bureaucracy. While in pedagogy the language that was used by professionals mellowed, in school design practice specific regulations were issued. The growing confidence of the system in itself was indicated by allowing some flexibility in the internal

(curricula, courses of study, methods of instruction, textbooks), but the state clung to its authority over the externa of education (size and nature of school buildings from hygienic and pedagogic standpoints, qualifications, sizes of classes, and the structure of the whole system). The administrative apparatus was built on the pattern of the old Prussian military-bureaucratic model: in some aspects it was decentralized (interna) and in some others it was highly centralized (externa). It is not difficult to see that by exercising control over the externa, room for flexibility in determining the interna was limited. This seems to me a new step toward a hidden control in and over schools. Later "Standards" and "Regulations" were exchanged for "Suggestions" in the English, and Verordnungen (orders) were replaced by Rechtlinien (guidelines) in the German terminology heralding the coming of the space age in control techniques. Caudill gave an account of the period:

[F]rom 1915 to 1945 progress in school planning slowed up, and probably the greatest reason was the enactment of codes and regulations. Laws were passed that restricted bilateral lighting. Laws were passed, too, that regulated the size and shape of classrooms. There were even laws that said in just what direction the axis of the classrooms should be oriented ... Only a good Mohammedan could catch the spirit of such planning. (Caudill 1954:16)

In England the first Building Regulations were issued in 1907 and were revised in 1914. In 1926 these were withdrawn

and the recommended floor area per student was reduced from 14-16 sq. feet/pupil to 10 - which had been the Victorian standard. The 1925-27 Baines Committee found that the reduction would not have any ill-effect. At this time 'scientific' experiments and expert opinions supported the claim that less space was adequate. In 1936 a set of recommendations, the "Suggestions for the planning of buildings for public elementary schools", came out which remained in effect until the 1944 Butler Act. In 1945 the Standards for School Premises Regulations were issued. It contained statutory standards for the first time, and was later modified in 1951 and 1954, and altered in 1959 and 1969 (Seaborne 1971b; Seaborne-Lowe 1977; Stillman-Castle Cleary 1949). The 1945 document

[B]rescribed almost all the physical requirements for school building in such detail that they were capable of literal translation into bricks and mortar without any undue exercise of the imagination. (Godfrey-Castle Cleary 1953:34)

Caudill puts the date of the turning point at 1950:

Realizing that school architecture, like democracy, develops through stimulation, not dictation, we are beginning to see that even the best examples of school buildings are only steps towards perfecting better ones. (Caudill 1954:17)

The way of directing developments (whether it be the child's or the architect's) is the means of control. This control

shifted from dictation to stimulation. What is really interesting is that a 'humanistic' or 'pupil-centered' philosophy came about when progressive movements in education had just burnt out, the event marked by the death of the Progressive Education Association in 1955. From the 1910s to the 50s, the period when progressivism flourished, it had almost no effect on school architecture.

Summarizing the developments in mainstream school architecture in the first half of the twentieth century it can be said that they were chiefly the extrapolations of previous trends. Educational systems turned into professional bureaucratic organizations: homogenous at elementary and differentiated at higher levels. To justify their necessity as compulsory institutions, it was argued at that time that schools are essential for the (mental, emotional and physical wellbeing of members of society. Consequently, class-stigmatized academic subjects were replaced by 'practical' curricula. School buildings became bigger in size and more complex in their internal arrangement as a result of increasing professionalism and complexity in organization. When the 3Rs prevailed elementary curricula and all the 'practical' subjects were optional amendments, and the school building was structured appropriately: it contained rows of classrooms arranged along corridors or around courtyards, while some additional specialized spaces were added in separate clusters or wings.

Besides this mainstream of education there was an important development in this period which had long lasting effects on education. The next section will discuss the importance of progressivism.

### 5. Progressivism in Pedagogy and School Architecture

Since Horace Mann American educators, truly republicans, have been attracted to the concepts of "self-government" or "self-control". By adding some Anglo-Saxon rationality the phrase "voluntary compliance with the laws of reason and duty" was coined (Cremin [1961] 1964). Cremin quotes from Rugg and Shumaker's book, The Child Centered School:

"The creative impulse is within the child himself ... No educational discovery of our generation has had such far-reaching implications. It has a twofold significance: first, that every child is born with the power to create; second, that the task of the school is to surround the child with an environment which will draw out this creative power." (Cited by Cremin [1961] 1964:207)

In the light of the previous chapters, it is clear that nothing really new had been discovered. The reason why it seemed to be new was that although the progressives referred constantly to Prussian or German educators, they saw only what they wanted to see. No references were made to, for instance, Pestalozzi's authoritarian patriarchy or to his ideas about the 'necessary humiliation' of the child.

Actually American educators have always treated their European forerunners with a great deal of liberty (see Chapter IV). We have here two similar philosophies developed rather independently and while one was supposed to support totalitarian absolutism, the other was claimed to be a buttress of democracy.

Educational debates between progressives and essentialists, idealists and realists were more or less methodological. Nasaw (1979) thinks that the educators' dilemma was to produce either self-directed individuals or dependent wage workers. All parties, however, wanted to raise people for a free and happy world. Few would have disagreed, for example, with Washburne's Prussian-like sentence, spiced with a pinch of Benthamism:

Each child is a person, a living, growing human being, with the right to physical and mental health, with the right to happiness. (Washburne 1940:3)

The fact is that the notions of "self-directed individuals" and "dependent wage workers" were not and are not contradictory to each other. And progressives knew it. Parkhurst, who probably provided the most freedom to her pupils, wrote that the school has to secure the

[F]reedom for the individual to develop himself. This ideal freedom is not licence, still less indiscipline. ... The child who does as he likes is not a free child. He is, on the contrary, apt to



become the slave of bad habits, selfish, and quite unfit for community life. (Parkhurst 1926:15)

Unwittingly Parkhurst is echoing Fichte's ideas about the nature of freedom. And if obedience and freedom were compatible concepts for Fichte why should they not be for the progressives? In case of any doubts, let me quote Marietta Johnson's Thirty Years with an Idea from 1939:

"[C]hildren do not know what is best for them, ... They have no basis for judgement. They need guidance, control, but this must be really for their good, not merely for the convenience of the adult! Every effort is made to have this conformity merge into and become obedience. That is, to have the child's will to act in harmony with the adult will." (Cited by Cremin [1961] 1964:152)

On the subject of school architecture, progressives, for a long period, were not concerned with revolutionary school designs at all. Dewey, for instance, who is on almost every modern architect's reference list, did not say anything spectacular about school buildings. He did say in 1900:

"Just as a biologist can take a bone or two and reconstruct the whole animal, so, if we put before the mind's eye the ordinary schoolroom with its row of ugly desks placed in geometric order, crowded together so, there shall be as little moving room as possible ... we can reconstruct the only educational activity that can possibly go on in such a place. It is all made for listening -- for simply studying lessons out of a book is another kind of listening." (Cited by Davis-Loveless 1981:29)

It seems to be that for Dewey an airy room filled with

nicely designed desks arranged in some artistic disorder leaving space for 'activities' would have been ideal. However, when he wrote his "Preliminary Report on Turkish Education" in 1924 he mentioned none of the above requirements but mentioned instead the need for special facilities, such as workshops and laboratories, which were not uniquely characteristic of progressive schools. He said:

The construction of the school building bears a closer relation to the kind of instruction given, and the methods of school discipline and instruction, than is usually believed. The ordinary construction almost automatically prevents the adoption of progressive methods and restricts teachers and pupils to the use of text-books and black boards, with at most the addition of a few maps, charts and materials of object-lessons which are merely observed but not actively employed. (Dewey, J. [1924] 1983:303)

Unfortunately these statements do not throw light on what exactly he thought to be a solution except that more room and facilities were required. Early experimental schools, until about the 1920s, had traditional classrooms. Schools of the late 1910s show rows of desks frontally arranged with an empty space on the right side of the classroom which was sometimes furnished with tables and chairs for adult activities (See: Dewey, E. 1919). In bigger schools specialization and departmentalization characterized progressive schools. The Gary plan, which started in 1908 and spread out to almost the whole continent in the 1920s,

was the token example. William Wirt, the inventor of the "duplicate school" or "platoon system" or "work-study-play" method, organized his schools into two major functional units: one was a group of regular classrooms for 'drill-subjects' and the other a group of spaces such as the gym, auditorium, shops and playground. Pupils were rotated through these various learning spaces, thus a higher degree of efficiency was achieved (Cremin [1961] 1964; Graves [1915] 1970; Johnson 1966). Helen Parkhurst in her Dalton plan reorganized the school in a manner that each and every classroom was converted into a 'laboratory' packed with materials of one particular subject. Other changes also remained within the given architectural limits.

[W]hen the old classroom desks were re-grouped in the laboratories they were placed front to front, five together, for the use of separate grade groups ... In the hall one hundred and fifty lockers were erected and numbered to serve as a receptacle where each pupil could keep the miscellaneous articles which formerly accumulated in the classroom desk. (Parkhurst, 1926:41-2)

To each subject one specialist teacher was assigned. The system was thought to be revolutionary as opposed to the 'old' class system but we have seen in the previous chapter that in fact the 'laboratory' concept had been used in Germany well before the progressive ideas came about.

Perhaps the most interesting progressive for my study is Carleton Washburne, who devoted some words to school

architecture. Washburne was responsible for the Winnetka school experiment which started in 1919. In Winnetka the subjects were divided into "common essentials" (3Rs, sciences, and social studies) and subjects for "self-expression" (Cremin [1961] 1964). The Skokie school, Winnetka (Plate V/14) was built in 1924. It is striking in its heavy symmetry, with the administration offices in the axis. Actually it was a cross-breed between a German Schulkaserne and a Victorian city school. The point here is that there was no need for revolutionary new buildings at this stage of progressivism. This time it was not the architectural form that changed but the relationship to it. What teachers did was to remove the screwed-down desks and to paint the rooms with brighter colours in order to make it a "gay and homelike place" (Washburne-Marland 1963). It is hard to assess though what, in fact, classrooms looked like because the enthusiastic accounts of the new education (e.g. Rugg-Shumaker's "The Child Centered School" in 1928; Hartman-Shumaker's "Creative Expression" in 1926) show children only in costumes performing a play or painting, or working in a workshop etc. One would think that these children never read or wrote a single letter in school, however, solid basics were taught in these schools too. But progressives tried so hard to make us forget about the old school that even when children were pictured sitting they were carefully seated on the ground or on stools and never

at desks. In these cases the formality of the situation was often mitigated by dressing them up as Navajos or Medieval monks or something else required by the program. In Washburne (1932:36) I found one photo of "A typical first-grade room during a period of individual work". The picture shows 14 small tables arranged in outrightly random order. There were one to four children working at each table. Under the window a long couch can be seen for story telling activities. Washburne turned rather poetic in describing the room:

Is this a schoolroom? If so, where are the even rows of desks? Why isn't the teacher sitting at the front of the room?.... (Washburne 1932:121)

Later he concluded in a more objective manner:

It is true that the classroom during a group or creative activity period bears little resemblance to the traditional classroom. The traditional classroom emphasizes uniformity. The classroom during a group or creative period emphasizes variety, individuality, self-expression, combined with group unity of purpose and spirit. (Washburne 1932:140)

No one should think though that the design of Skokie was either an accident or the result of architectural incompetence. It was functional for the 'new' education, I suspect, because what happened when the period of 'self-expression' was over?

A bell rings. Children drop their work, straighten out the room, and line up at the door. Another bell, and they file out, turning to the right down the corridor. (Washburne 1932:124)

Washburne restricted his comments to "group or creative" activities, anyway. His sentence implies that classrooms during other, traditional activities might have more closely resembled old school rooms. It is also interesting to follow the development of Washburne's thinking about school facilities. In 1940 a new school building was erected in Winnetka, the Crow Island School. It was designed by Eliel and Eero Saarinen and was supposed to be a very progressive school plant (Plate V/15). Washburne introduced a new concept: "The classroom is ... self-contained - like a cottage classroom" (Washburne 1940:7). The idea, however, was some five years old by that time. Richard Neutra built his Bell experimental school in Los Angeles in 1935 in an almost identical way (Stillman-Castle Cleary 1949). The ideal classroom shown in Plate V/16 served as a model for architects in the 1950s. The ideology that was conveyed by this unit-approach becomes clear from the description of the classroom:

Within it the children can live their lives as an independent family. Yet it is part of a larger unit. It opens onto a corridor lined with flush lockers for wraps. This corridor connects it with other classrooms, with the gymnasium playroom, the assembly room, library, art room, general shop, science and cooking rooms, and the administrative offices. And

both the corridor and the outside paths lead to the large all-school playground. The whole school is therefore an integrated community of classroom families. (Washburne 1940:8)

No matter what progressives called the basic unit of their schools it was recognizably a classroom. It had more windows, less rigid furniture and more room but the fundamental idea was to maintain the philosophy of variety and individuality merged into the whole - a line of thought that strongly resembled that of the old German philosophers. The part gained meaning only as a contribution to the whole while remaining a relatively autonomous unit. The individual activity was celebrated within a larger order.

I have argued that progressivism appeared to be a genuinely new approach to schooling but, in fact, in many aspects it was a new justification for previously existing method of control. The fact that until the 1940s progressives' school buildings were not different from those of the traditionals reveals that new theories were not incompatible with traditional settings and thus may have been only superficially new. Progressivism followed German patterns and, as has been elaborated, it asked for new methods in the practice of schools. Teachers and teaching spaces opened up and the freedom of the child was emphasized, strongly resembling the familial way of control in German schools (See: Plates III/17,18). I have suggested that this control was also present in progressive theory and

practice, although, it was less visible than in traditional schools.

#### 6. The Fifties - The Impact of Behavioral Psychology and Functionalism on School Architecture

The basic idea in the fifties seems to have been that schools should convey 'real' skills and 'useful' knowledge by letting the pupils experiment and experience. Curiously enough the 'new' ideology referred to elementary, or more precisely, lower elementary school children. The progressive logic would suggest that if children learnt self-control and the meaning of freedom at a tender age, then they would be mature enough for even more freedom in their higher classes. But both in theory and practice the opposite happened: kindergartens and lower elementary classrooms were designed to be more or less flexible and informal, while higher grades and high schools remained as rigid as they had been for a long time. In England Godfrey and Castle Cleary wrote:

[C]hildren of five to seven years of age in particular, are no longer rivetted to desks and expected to absorb a series of facts presented to them on the chalkboard by the teacher. Instead they learn the fundamentals of reading, writing and arithmetic by relating them to the everyday things they encounter in their young lives. (Godfrey-Castle Cleary 1953:92)

In fact, children were never expected to absorb "series of



facts" at the age of five to seven. They have always learnt the fundamentals of the 3Rs related "to the everyday things in their young lives". When children in the nineteenth century were taught the 3Rs by using solely the Bible, in that social context it was not less an "everyday thing" for them than anything used in teaching in the 1950s. In America a similar problem kept architects excited, i.e. how to make the school more life-like. "The modern elementary classroom is a place for whole living and is almost a world in itself" (Perkins-Cocking 1949:68) wrote the advocates of the self-contained classroom. After having made the school an identifiable, separate institution and building now architects tried to integrate the school back where it had been carved out. The aim of the school was still to train future citizens for their coming tasks and only secondarily, as a means to achieve ends, to provide them with knowledge. A Prussian overtone can be heard from the first part of Caudill's definition while the second half of his sentence has a utilitarian flavour:

Today we are interested in the development of the whole child... we try to make him a responsible and self-reliant social being; we attempt, partly by example, to develop in him an understanding and appreciation of democratic theory and practice; and, of course, we still purpose to make him literate and to provide him with a basic fund of knowledge. (Caudill 1954:24-5).

The "greatest happiness principle" was still there as well:

The school must now prepare each individual to live as happily as possible in this world at the peak of his productivity. That takes more than the three R's. It requires the development of understanding. It means learning more than what and where and when, and how many - the thing, the place, the time, the number; it means learning why and how; absorbing an active interest in the relationship between the individual and the group with which he lives. (Perkins-Cocking 1949:37)

The most interesting conceptual development of the era was that architects started to regard schools as buildings for children. "[T]he school building itself is to the student an instrument for learning" (Lopez 1956:xi). The school now was looked upon as a place for learning and not a house for teaching. The difference is more than a play on words. Teaching is always a purposeful activity with a previously designed set of goals. It inevitably implies a dichotomy between itself and learning, since no teaching can take place without learning. In addition, when teaching in school, initiation usually comes from the person who wants to teach and in the case of compulsory elementary education the possibilities for the learner not to participate are extremely limited. By putting the emphasis on learning instead of teaching the whole situation changes. First of all learning does not imply the necessity of teaching. Anybody can learn something without being taught, even accidentally. Thus learning is not necessarily teleologic either. What the educator should (or can) do is to provide an environment that stimulates learning. The notion of

environment which pervaded the thinking of the late fifties and the sixties, was nicely defined by Manning:

[E]nvironment is the sum of physiological, psychological and social sensations experienced by people in or around the buildings which follow from their use of those buildings. (Manning 1967:13)

Consequently:

New education, generally speaking, is exposure to favourable circumstances, exposure to the right kind of influence. (Neutra 1962:61)

The next step should obviously be to determine what kind of influence is the right kind. Thorndike gave us a clue in 1913:

"The best way with children may often be, in the pompous words of an animal trainer, 'so arrange everything in connection with the trick that the animal will be compelled by the laws of his own nature to perform it.'" (Cited by Cremin [1961] 1964:112)

Very important words. In order to circumscribe the architect's job, Neutra used another edifying and illustrative example. When asked how he would go about planning a school he said that his approach would be the same as if he had to design a canning factory.

"I would passionately study the process of, let us say in this case, canning tomatoes. I would look

into how these tender tomatoes are first grown, then picked and brought in from the fields; how they are cared for, cleaned, and cooked, how they are graded and assembled into containers, how cans are sealed and labeled, and how the containers must in turn be fitted together in manageable boxes for economy in handling. I would study the space involved and the equipment necessary to carry out this process of preserving and developing God-given qualities and nature's endowment, and all the treating and trafficking that goes with it. In the case of the school I would rather do the same thing." (in Caudill 1954:21)

The problem with the example is not that Neutra compared tomatoes to children (which he did not do anyway) but the implications of the parallel. His logic was to derive the canning factory's plan from the canning process. When, however, he and others went about designing schools they seem to have planned the school building to be an answer to the children's needs and not to those of the teachers. Here architects acted as if they had designed the factory for the tomatoes - which is absurd. Nevertheless, they tried the impossible: to derive the design of a social institution from the nature of the child. It is not very difficult to recognize the effect of behavioral psychology on designers. Behavioralism, being empirical and inductive, scientific and rational, attracted the attention of architects. The gist of this new approach was aptly characterized by Skirvin and Berman:

[I]f presented with a student who, according to a teacher's report, "cannot control his temper", the

behavioral psychologist will not concern himself with ascertaining "traumatic events" in the student's life and their possible relationship to current problems. He avoids this procedure not because current problems have no causes, but because such information is generally incomplete and often misleading. Instead, his frame of reference is that undesirable behaviors exist because the present environment either supports them or does not support desirable behaviors. The task then becomes one of rearranging the environment so that it supports desirable behaviors and does not support undesirable behaviors. (Skirvin-Berman 1973:31)

The example given, of course, presupposes a set of assumptions which the authors enumerate:

1. Behavior, in part at least, is a function of its consequences. ....
2. By arranging the consequences of behavior, we can increase or decrease its frequency, alter its topography or form and produce other qualitative changes. ....
3. All organisms, human and non-human, function according to natural laws. ....
4. Behavior analysis and change procedures are applicable to all animal species, including the human, and all types of behavior, human and otherwise, can be dealt with by these procedures. ....
5. Individual human beings differ considerably in terms of what constitutes positive and negative consequences of their behavior for them. ....
6. A major step in the arrangement of consequences in order to modify behavior is called programming. (Skirvin-Berman 1973:33)

With all this in mind architects realized that they needed help from other professionals in order to develop the proper environment for the learner. The task was to study the physical, emotional and social needs of the pupils. Caudill mastered the new language: he talked about the "pupil as an organism" which, "in order to function .... needs air and

light as well as food" in the process of teaching "the human animal how to live" (Caudill 1954:4-9). He drafted in a legion of different experts in order to gain maximum information about tomatoes and their canning (Plate V/17). The "Profiles of planning knowledge" are shown in Plate V/18. From the composite it can be seen that the team admittedly knew least about the basic needs of pupils. Experts did not know very much about "community needs" and "public relations" either. This in itself was sufficient to destroy the working idea that school buildings were answers to specific user-needs. Yet behavioral programming, as defined above, was justified by calling it a response to emerging new needs. Schools, however, were and are as much the reflections of children's needs as the canning factory would be of tomatoes. Or, to use a human example of another non-selective organization, it is as true as to say that jails are built for prisoners' needs. Nevertheless elaborate studies were pursued in order to determine the physical needs of the pupil.

Progress in behavior analysis and change is generally the result of a long series of intensive investigations, each of which has contributed a small bit of new and useful information to the sum total of knowledge. (Skirvin-Berman 1973:35)

Caudill in 1954 repeated the same experiment that Clay had performed some fifty years before: he examined different

teaching situations' spatial needs so to modify the size and the shape of his classrooms (See: Caudill 1954). Calculations concerning the use of physical energy concluded that by creating a comfortable environment, a significant amount of human energy could be saved and hence used for learning or other 'useful' activities (Lopez 1956). Plate V/19 shows a study on "The physical size of the client". Although the design of furniture related to the size of children of different ages was not new at all (See: Barnard [1848] 1970; Schmidt 1967), now it carried new overtones. What was new was the idea of tabulation in the classroom. Pupils were not only sorted out by age and size, but grouped according to 'abilities'. Distributing individuals to groups according to their 'natural capabilities' suggested that their place in the school was not the result of arbitrary authority but of their own 'fault'. Sennett (1972) described the process as transforming the concept of self into the notion of individual.

Another implication of biofunctional attitudes was the invention of a 'child-scale' environment.

- \* we still have schools which are scaled to the adult:  
... these serve to remind him [the child] constantly that he is small and dependent in a world of watchful giants. (Caudill 1954:10)

And there began the real dwarfing of the child by designing child-scale space and furniture. Everything was planned

small, low and short, making the child feel indeed small since everything else out of the school was 'big'; the houses, the people, the trees, the furniture at home, everything. The child learns that something is too big and out of scale when he is trained by minuscule spaces and furniture that it is BIG. The idea had its peak in the seventies when Taylor and Vlastos (1975) suggested either stooping down to the child or lifting him up in order to have eye-to-eye contact.

After all the fireworks of painstaking researchs and new big words, one would have expected something radically new in the schools of the 1950s. Instead, we find the self-contained classroom as a basic unit, now called, the "envelope" (Plate V/20):

[E]ssentially the modern school is built from the classroom up. And for a good reason: the classroom engages most of the pupil's time. (Perkins-Cocking 1949:49)

Schools, on both continents in general, contained the administration unit in the core. In America:

Experience has shown that administrative offices should adjoin the main corridor, or be otherwise centrally located, for ease in supervision. (Perkins-Cocking 1949:51)

In England the head teacher's room



[I]s close to the main entrance, where it is readily seen by all visitors; it will also be at the centre of the school in this position, if the main entrance is so designed as to be an integral part of one of the communal areas. (Godfrey-Castle Cleary 1953:109)

Supervision, however, owed less and less to the old Lancastrian type of personal presence. A network of administrators worked behind the cheerful and child-scaled scenes in order to secure the right kind of influences. Administrative control was maintained through Benthamite devices: closed phone systems, intercoms, central temperature control panels, etc. Plates V/21,22 show the image of the top man in schools. Plate V/21 is particularly interesting for the artist who designed the advertisement drew a school he thought as being representatively symbolical. The Greek-style entrance and the frontally arranged classrooms would indicate that progressive ideas were still in the books. The artist obviously thought that this was the kind of school that a principal reading the journal would identify as being similar to his own.

## 7. Summary

In the first part of the twentieth century a long process came to an end: the institutionalization of education was completed. School systems became bureaucratic organizations (in the Weberian sense) all over the civilized world. We have seen that it started with the convergence of

philosophies and practices at the end of the last century. The development of the system implied standardization as well: while educational programs showed a never seen variety, schools tended to look similar to each other. Although there were new developments in school architecture such as the open-air movement or some village schools these trends were short lived. Finally the style of the big multi-storey, austere and often unfriendly urban school won over the timid alternatives. If schools were similar in the nineteenth century England to factories, and to family houses in Germany, now they became characteristic scenes for a Kafka or Musil novel. The school-factory and the school-home was superseded by the school-bureau. Within the school office-thinking resulted in assigning spheres and spaces of competence to specialized teachers and administrative personnel in a growing hierarchy. Spaces in schools became more and more specialized. Classrooms and subsidiary spaces, gyms, workshops, labs and libraries were organized so as to be different departments of the Bureau. In its principles this trend continued after the Second World War.

Beginning in the late 1920s schools stretched out on huge sites and became specialized. Finger-type plans, long wings of classrooms, laboratories and workshops prevailed (Plates V/23,24). In Plate V/23 the details of one section, the "unified art department", show the hitherto unseen

complexity of spaces and sophistication of teaching programs. The ground plan in Plate V/24 contains a cafeteria and a community use room, which were also signs of expansion in the activities of educational institutions.

Schools became complex networks of activities, professions and spaces. They needed less direct state control as the complexity of their organization increased. The network needed no more external intrusion: schools were switched on automatic control.

When bureaucratization of elementary education had come to completion, more energy was needed. Schooling was compulsory and directed by professionals but it was still a sort of communal service. Citizens ought to be convinced that education is in their and their children's own interest. While on the one hand school systems were bureaucratic institutions somewhat alienated from the groups they ought to serve, on the other hand educators tried to integrate this alienated body back into social context. The problem was that these two effects worked in parallel. Progressive educators, as the analysis of the early progressive school building shows, did not require new settings for their theory. Until about the 1940s they had no effect on school building practice. The emphasis they put on freedom within limits and the interest of the child in their theory resulted in the fact that the progressives were not disturbed by classroom-schools just as their

Prussian ancestors were not bound by classrooms. The actual function of self-contained classrooms was the same as that of Pestalozzi's homely classroom.

In this century a new controlling technique developed: the direct legal or financial control over schools and the harsh disciplinarian control in the classroom were slowly replaced by indirect control. "Regulations" were reworded so as to be "Suggestions" for the construction of school buildings. In schools children came to be influenced by changing elements of the environment to make them behave. It may be that this change from direct to indirect control has led to more manipulation in education. The nature of this manipulation is discussed in the next chapter.

## CHAPTER SIX

### Freedom and Its Hidden Limits: System Buildings and Open Space

This chapter attempts to explain the most recent developments in the theory and practice of control methods. The 1960s was a period in educational history when the obvious crises in the classroom resulted in even more optimistic plans for the future on the shop floor of education. Systems thinking conquered the minds of educators as well as of architects. An inquiry into the nature of systems approach will show that behind the greater freedom for action there was an inbuilt controlling mechanism. I give an analysis of a 1960s' invention, the "open space", which was much favoured throughout the '70s. Open space was the last step towards making control subtle and hidden. It will be argued that after the interna of education had been freed and made more flexible, it was time to liberate the externa from authoritative rulings. This did not mean the coming of limitless freedom because by the implementation of modules both in the theory of curriculum

and of architecture, the limits of possible deviations were set. Only the methods of control have changed and not its nature. An analysis of the famous Volvo experiment will help us to understand the reasons.

### 1. The System - Theoretical Background

In the 1960s it became clear that positivist methods were limiting the range of questions for scientific investigations. Relativistic theories in social studies, anthropology, linguistics and literary criticism, brought about a new approach to words and things, namely structuralism. The search for structures started in linguistics in the 1950s. L. Hjelmslev, a Danish linguist, was one of the first in a long list of game theorists. He defined the structure of a game (like chess) as the compilation of rules which determine the number of players and figures and the ways certain elements may be connected with each other. The structure, was as different from the use of the game as language is different from its usage (as the Saussureian langue [language], differs from the act de parole [speech]). Levy-Strauss in anthropology, Chomsky in general linguistics, and Foucault in history developed the theory into a view of the world which differentiated between overt, or manifest structures (material, quantitatively examinable) and latent, or energy structures (The Order of

Things as the English title of Foucault's masterpiece put it). The idea was that manifest structures are driven by energy and organized by superstructures, so our task is to analyse the elements of a social phenomenon (a subculture, language, piece of art, institution etc.) in their functional relationships to other elements. Then we will be able to determine the set of rules that governs the material substructure and grasp the substantial laws of the world.

At the same time in industry, prefabricated units emerged which could be assembled in various but not limitless combinations. Ironically, it was the military again which supplied innovations for school designers. During World War II a new scientific approach to problem definition and problem solving was developed, systems thinking. Systems approach was first successfully used by the British in planning their anti-submarine tactics. Moreover, the management of war-economy required a new organizational style which was capable of coordinating several branches of industry and agriculture.

One fundamental idea of systems approach in architecture is to think in modular elements. Modular means:

1. Having commensurable dimensions.
  2. Capable of arrangement with exact-fit, in more than one sequence or direction.
  3. Characterized by the use of structurally independent, interchangeable assemblies.
- (Boice n.d.:15)

This view turns away from self-contained units which cannot be organized in large quantities. Systems approach is the method for quantities and complexities - it is inefficient in small scales. Therefore, systems building was encouraged by multi-national corporations. Systems building also is:

The organization of programming, planning, design, financing, manufacturing, construction and evaluation of buildings under single, or highly coordinated, management into an efficient total process. (Boice n.d.:18)

Systems approach turned building industry into modern industrial enterprise from old fashioned manufacture. Buildings were no more individual artifacts but the products of a huge 'factory'. This resulted in education in a subtle way of control: organizationally independent schools and schoolboard were pulled together under the roof of some giant project (for instance SCSD in California or SEF in Toronto). The systems approach applied to school buildings meant that education became an industrial enterprise which provided the consumer with certain elements (modules) and also with a set of rules by which the elements could be put together to form a whole. It worked in a somewhat similar way to language: we have a given number of linguistic elements which, mathematically, could make 'n' combinations. But apart from the elements we have certain rules which allow some combinations and prohibit others. Still, we use



fewer combinations than that, for there are certain types which would be grammatically correct but would not 'make sense', for example, a fragment like, "the red elephant flies away". Thus under the grammatical control layer there is yet another (set of rules, less obvious, dealing with what we think is 'sensible' or 'logical'. The selection of words and the construction of syntax is a cognitive and conscious process in which idiosyncracies play a role. When we talk about systems in architecture we must take a similar approach. I am particularly interested here in the second layer of rules, that is the subtle controls at work on the architect when he chooses a certain combination of modules from the numerous technically possible variations.

## 2. The Sixties and the Systems Approach

Architects had already acquired the rudimentary vocabulary of modern pedagogy in the 1950s and started to use it confidently: "The task of primary teachers was nothing less than to teach children how to live" (Manning 1967:71) - wrote an English architect, and he also quoted one of his colleagues:

The most important thing today is no longer the acquisition of knowledge and skills, but the opening up of the mind... (Manning/1967:71)

It is interesting to see a playing down of the importance of

conveying knowledge in schools recur in the history of education. Philosophers of earlier times did not conceive implanting knowledge as the primary aim of schools either. When Manning finally tells us about the "specific goals for primary education" he uses the well-known building blocks of educational philosophy:

- (i) Physical development: the fostering of physical growth, good health and hygiene;
- (ii) Intellectual development: the organization of the numerous sense-stimuli which children receive constantly into meaningful patterns so that an overall understanding of the world around them may develop and give rise to the acquisition of skills enabling communication with others and acquaintance with knowledge;
- (iii) Emotional development: the encouragement of children's curiosity, interest, wonder, initiative, drive, growth to independence and their appreciation of beauty;
- (iv) Social development: the understanding of what good human relationships between individuals, groups, the school community and the wider community and the wider community of society require. (Manning 1967:72)

Interestingly, educational goals were arranged in a form of Maslowian needs, in harmony with the ideology which aimed to deduce education's objectives from the pupil's interests. Yet, it is clear that educational aims were no less created by adults than before.

Schooling ... means to train the individual to independent action, mature decisions, assumptions of responsibility. (Becker in Otto [1963] 1966:66)

wrote Becker, while another German author proclaimed that:

The child is no longer a passive object in the hands of an educator giving one sided, exclusively intellectual instruction. (Roth 1966:28)

This latter statement is surprising from a Swiss-German author since many-sidedness and anti-intellectual training has been the slogan of German educational philosophers for almost two centuries.

The theory of ideal education came to involve continuously changing programs and group sizes. A conference held at Mount Kisco gave the following recommendations concerning the proportions of different working methods in a week (Cited by Manning 1967):

|                              |                 |
|------------------------------|-----------------|
| Independent study by pupils  | 24% of the time |
| Personal tutoring (1 to 1)   | 5%              |
| Small group work (1 to 6)    | 25%             |
| Discussion group (1 to 12)   | 25%             |
| Instruction group (1 to 120) | 15%             |
| Whole school (1 to 400)      | 1%              |

This was supposed to be the framework of 'modern', teaching practice. I put 'modern' in parenthesis because these formulae for 'good' proportions were controversial and probably arbitrary. Ader (1975), for example, suggested another table:

|                                     |                 |
|-------------------------------------|-----------------|
| Instruction (160 pupils)            | 10% of the time |
| Individual study                    | 25%             |
| Audiovisual learning in groups (32) | 15%             |
| Ditto individually                  | 15%             |
| Discussion group (16)               | 15%             |
| Supervision, tests                  | 20%             |

The importance of these tables did not lie in the percentages they suggested. Dismantling the tissue of traditional subject teaching into activity groups indicated the trend towards systems thinking in curricular theory. Educators seemed to find the superstructure of teaching process (in terms of the structuralists) above the more apparent subject matter divisions and started to think in modules which could be assembled into bigger units by the rules of the game.

Christopher Alexander, a mathematician-architect, described two aspects to a system: (1) a system is not an object but rather a way of looking at an object; (2) a system is a kit of parts with rules about the way these parts may be combined (Boice n.d.). The rules are practically incorporated in the 'kit of parts' as much as a noun can be used only in certain positions a sentence. This means that in a system certain rules are in the elements and not in the book of rules. The rules of a language are learnt by the child by using the language and not by

studying a grammar book.

The discipline created by the use of industrialized processes must be accepted by those who are responsible for the project. (Boice n.d.:33)

This is the novelty of the systems approach. All the other characteristics, like the use of design grids, construction of relocatables, fast and cheap prefabricated building methods, were known or had at least been tried. Modular grids were used in the nineteenth century (Boice n.d.), temporary or transportable schools were built in the 1870s (Burchell-1980). Also the use of lighter constructions was encouraged in the 1910s and the 1920s (Seaborne-Lowe 1977; Townroe 1926). Architects in 1874 complained about schools built in London of prefabricated iron elements (Robson 1874). The new wave of prefabricated systems started in England right after the Second World War when shortages in conventional building materials and manpower coincided with the presence of an overgrown and then idle metal industry. Schools which were built in Hertfordshire in 1946 were really old schools constructed by new building techniques. The reasons behind the use of prefabricated systems were highly technological: the aim was to find a building technique which would allow for large scale and fast construction.

The present emphasis given to the advantages of standardized mass-production is, in reality, an emphasis on speed, and speed is essential in putting the new Act into operation. (Stillman-Castle Cleary 1953:50)

The comparison of this argument with that used to back-up the California SCSD (School Construction Systems Development) shows why I place the beginning of systems thinking in the 1960s despite the numerous technical antecedents in England.

Basic to the process of developing the SCSD system was the notion that it is possible to analyze a behavioral process, such as secondary education, and to use the results of such analysis to determine the design of building components which will facilitate that process. (Boice n.d.:103)

Since the behavioral analysis resulted in a system which, as we have seen, contained certain rules and discipline,

The design of the school building can either enhance or limit the administrator's freedom in planning the way in which the occupants and activities of the school will be organized. (Boice n.d.:119)

Moreover, the system did not only discipline the users and administrators but it also put architects in a new position: they could design "freely", that means within limits. The system is GOOD - possible failures were blamed on human errors:

Successful use of the SCSD building system requires a skill, imagination, and sensitivity still lacking among many U.S. architects ... to a comparable degree, school administrators and school boards share the credit or blame. (Griffin 1971:58)

In order to solve this problem the SCSD staff laid particular emphasis on the "Integration of Components". 'Coordination', a word which has been used by educators for a long time, now entered the vocabulary of architects as well.

"One of the results of the increasing complexity of modern buildings is the necessity for a high degree of coordination in the design of the components that make up the buildings. ... For the success of this project it is important that coordination begin as industry starts to design the products rather than architects attempting to coordinate already designed products." (Contract Documents and Performance Specifications, Cited by Boice n.d.:196)

Design of the modules and consequently a significant part of the system was in the hands of corporate business. Plate VI/1 shows the plans of two bidders for SCSD subsystems. The CLASS (Coordinated Light Air Space System) group was composed of Kaiser Steel, Western Sky Industries, Lennox and G and T Soule. The Enviro Construction System group consisted of Wailes Prestressed Concrete Corporation, Western Sky, Lennox and G and T Soule. Not too many names change in other biddings either.

### 3. Rhetorics and Buildings

Architects working either with systems or any other building techniques used a common theory of education. Let us now have a look at the schools which were designed to

[S]trive to awaken and encourage a harmonious, democratic relationship between young and old and to counteract the dehumanizing influences of today's society. (Roth 1966:6)

What was meant by this is suggested by the following:

It must be a house for children, for them to develop and determine their own yardstick; a house liked by the young folks, a house in which they like to stay and in which they find relaxation. (Dressel in Otto [1963] 1966:20)

In Plate VI/2 there is the ground plan of a German school in Darmstadt. I have chosen this particular design to exemplify trends in Germany in the 1960s because it carries some traditional Prussian characteristics. Otto ([1963] 1966), a widely quoted authority on the subject, presented numerous German schools in his book. Monolateral lighting, it seems, was disappearing again in the designs of German architects - only three plans used it. Other Prussian traditions, like the isolation of the headmaster's office, the caretaker at the entrance, and classrooms opening from long corridors prevailed in the examples (they are obvious in 10-12 cases). The schools were organized into functional units which had been the practice since special facilities



came into fashion. Finally, we learn that "The classroom is the centre of the schoolhouse" (Dressler in Otto [1963] 1966:19). Or, to put it another way:

Although modern pedagogics demand more differentiated teaching methods and a considerable number of special purpose rooms, the classroom must still be considered the basic element of the school. (Roth 1966:42)

"Classroom" may be thought of as a code word for the certain kind of control that developed in the nineteenth century (See: Chapter IV). The classroom shown in Plate VI/3 can be regarded as the symbol of the pedagogical pseudo-revolution. It was a self-contained classroom with tables arranged diagonally instead of facing the teacher. The teacher, though, was provided with a bigger space to bolster his authority. The classroom was designed to be a unit which could be multiplied. Special facilities were added according to the size of the school. Interestingly, bigger schools got more special facilities than small ones. City schools with high enrollment numbers offered gymnasiums, laboratories, clubs etc., to potential users while rural schools simply could not afford such luxuries. This means that the provision of special facilities depended on financial rather than philosophical considerations. Educational philosophy focussed on classrooms because they were available everywhere. They had the advantage of:

Freedom in teaching  
 Working in small groups  
 Mobility of seats and desks  
 Ample cupboards, shelves, etc.  
 Friendly and stimulating atmosphere. (Roth 1966:46)

Little changed in the classroom designing practices of English architects either. Plate VI/4 illustrates the point: the room was more spacious than in the German example but the individual desks were frontally arranged. However, the rows were daringly unparallel with the walls. The new arrangement, though, was in order to provide the pupils with a better angle of vision towards the instructor or the blackboard behind his desk. Perhaps it is needless to say that the text did not refer to the individual desk placed opposite to the 22 smaller ones as the "teacher's". We all just know that it was. In the general outlay of the school, for a change,

A tendency in much recent primary school planning has been for the hall to be placed in the center and for the main circulation routes to be around its perimeter. (Manning 1967:33)

Other traditional Anglo-Saxon traits were also apparent: in the examples quoted by Otto ([1963] 1966) all buildings had bilateral lighting, almost all had the principal's office at the entrance and that of the caretaker in the back, and half of the plans avoided the use of corridors for circulation.

While theory predicted an ever-changing learning

environment, schools remained reluctantly 'traditional' in general. A widely quoted and representative compilation of European and American designs (Roth 1966) supports the argument. Photographs taken of classrooms showed a majority with frontal classroom arrangement. The analysis of the architectural articles of a prominent American monthly, The Nation's Schools, showed similar results. I studied the issues of five consecutive years (1962-1966) searching for photos or designs of classrooms. The first surprise was that although every issue contained a description of at least one school, there were hardly any figures showing classroom interiors. What was advertised were the halls, labs, libraries, clubs, even corridors etc., that is, the 'non-essentials'. The few classrooms presented had mostly frontal arrangements. One schoolroom had an open space design and two photos of it showed a most rigid, frontal arrangement.

In the light of these observations it seems that the much heralded 'educational revolution' was, in fact, mostly in the minds of progressive architects. School designs published in the Architectural Record, for example, were much more progressive than those in a journal for educators, like The Nation's Schools. The result of this duality was that theory became separated from practice in school architecture. On the one hand, traditional schools were built countlessly, while on the other hand progressive

experiments published in professional journals excited the imagination of architects. The split between theory and practice was somewhat similar to that in education.

#### 4. Open Space and the Ultimate Freedom

It would be both unfair and historically incorrect not to talk about the great invention of the 1960s which flourished in the early seventies and still has an impact on school architecture. Flexibility and open planning seemed to be the blanket solution to design and even to social problems. The trends are well exemplified in Plate VI/5a,b. Kempton and Firgrove schools represent a moderate planning attitude, traditional rectangular elements arranged around a hall (now called "multi-purpose room") and/or a court. Offices, health centers, faculty rooms, libraries and other facets of bureaucratic and professional authority compose a compact core to the building. The new development ~~is~~ exemplified by Sherwood and Valley Winds (Kensington) schools. They did not resemble any school building hitherto built, moreover, they did not call to mind any other public or private construction. Paradoxically this feature made them unmistakably schools. Both imaginative designs like those above, and the LEGO-like constructions of systems building, used flexibility as a password to the space age. The presumptions underlying the idea were summed up in a

picturesque manner by one of the popularizing booklets of EFL (Educational Facilities Laboratories) (Plate VI/6). "Education is dynamic" - this was the pivoting point of the theory and this the weakest point as well. In what sense was education "dynamic"? From the viewpoint of this study it was not more dynamic in the 1960s than it had been a hundred years before. Moreover, it was not clear why society was to be seen as more dynamic now, than, for example, at the time of the Industrial Revolution when masses were shifting from rural to town areas, from agricultural to industrial work, not talking about the possibilities of individual mobility. "Facilities are shaped by program." What was this program that called for a new facility? Architect-poets had only vague assumptions about the aims:

[T]he school should be a microcosm of the outside world, education is a lifelong process merely formalized in the schoolroom; and the school's task is to equip students for the jolts and unpredictable vocational challenges in a tumultuous world that has little need for tamed human parrots. (Griffin 1971:26)

The kind of shyness that prevented enlightened educators from showing classrooms in The Nation's Schools worked here too, because when the same authors got down to the basics they concluded that

Open classroom educators accept the notion that children must acquire a thorough elementary school knowledge of reading, writing, arithmetic, and other disciplines. (Taylor-Vlastos 1975:112)

After this, the assumption that "buildings must be capable of change" seems to be weakly founded. The systems buildings were, theoretically, answers to urgent educational needs, yet, when in operation, architects, administrators and teachers could not exploit the given possibilities. Moreover, it was a common belief that

As a beneficial byproduct, the mere ability to create widely varying divisions of space has stimulated educators' imaginations. (Griffin 1971:18)

Perhaps the assumption here is that the idea came from the systems designer in order to stimulate education. Hence modular space was perceived as a possible cause of dynamism instead of being the result of it. This philosophical perplexity was the best indicator of the cleavage between the theory of practice and the practice of theory.

In some cases, the schools are not being used in the way the designers anticipated. Large open spaces, which were designed for team teaching, are being used as self-contained classrooms with disastrous results acoustically. (Boice n.d.:456)

Internal flexibility, in fact, offered spectacular possibilities. In Plate VI/7 the evolutions of an English department can be seen. In terms of space and furniture

allocations Plate VI/8 serves a good example. It was thought that these new schools would adapt to children more than the old ones did:

These classrooms are of unexpected and often changeable shapes, eminently adaptable to the non-symmetry of young people. (A Convertible... 1970:73)

Warnings, however, were sounded already in the 1960s:

Now ... when teaching spaces are of various sizes, the repeated unit is often a structural bay - more flexible than the old classroom in the space arrangement it allows, yet equally rigid in its geometry. (Geometry... 1964:134),

Perhaps the most often quoted expectation of open space was that it would teach freedom to both students and teachers.

If the child is being developed for the responsibility of citizenship, then responsibility must be a part of his daily program in school. A new attitude toward discipline brings a building designed for freedom - freedom of movement, freedom of individual study, freedom from traditional study hall and supervised corridors. (Modern... 1963:50)

In the open classroom the teacher "is not obsessed with maintaining order, silence and control" and the children "educate themselves while participating in projects which interest them" (An Open Plan... 1973). And again, Fichte's soul was haunting the new schools:

The purpose of open education is to produce adults who no longer need teachers, but know how to educate themselves - human beings who will continue to be self-renewing learners for the rest of their lives. (An Open Plan... 1973:126)

The meaning of freedom (mostly of movement) was similar to the classical Prussian concept in that children were obviously not free to move where and when they wanted. In the first place they had to go to school. Philip Drew, in his excellent article on open space ideology, quoted a supporter of the system who thought that open space does not work when:

"[P]upil and teacher do their own thing, no goals are set, noise is encouraged, organization of material centres is non-existent, wandering is allowed, constant evaluation and teacher assistance is missing, and when staff cooperation is poor." (Cited by Drew 1970:56)

So if open space worked

[B]ehind the chaos there is order, maintained by the less immediately visible teachers. (Griffin 1971:27 *Italics mine*)

The control over children did not disappear, indeed I would say it was not even mitigated. It just became less immediately visible together with the teachers. But interestingly enough teachers experienced the same lack of freedom. Drew quoted two observers who had examined the life in the 'snail-school' (Kensington or Valley Winds) who



were told by one of the teachers:

"In my own self-contained classroom, I had all the freedom in the world. I could extend a learning experience, or shorten it or cut it out completely if I wished. Here, I'm forced into a rigid schedule. She said that it seems very odd and yet the freedom that they wanted was the thing which inhibited them and made them more rigid." (Cited by Drew 1970:51)

The rigid schedule that the teacher was complaining about was called 'cooperation' in the theoretical jargon. Educators, since the time of the early progressive movement, had not made compromises when arguing about cooperation. Cooperation

[C]onstitutes a problem in school procedure. It should be so organized that neither pupil nor teacher can isolate themselves, nor escape their due share in the activities and in the difficulties of others. (Parkhurst 1926:17)

An EFL leaflet in 1969 was no less aggressive: "And the main thing is that the teachers have to get along" (Cited by Drew 1970:51). Another, calmer voice put it this way:

The open space phenomenon was founded upon a desire to facilitate greater inter-personal interaction. (Laramy 1976:2)

It may be that this brutal democracy contributed to the spectacular failure of the Kensington project and of other open space schools. The teachers seemed to ask for the

trouble themselves. In the preliminary stages of the SCSD project school personnel clearly indicated the need for flexibility in the building. Yet when the schools were ready the analysis of "users' responses" indicated that the majority of the staff was not aware of the flexibility of units. But still 70% of the teachers said that they wanted some changes in the building (Boice n.d.). Apparently few teachers could afford to be 'old fashioned' and gave the expected answers to the questions. In the Kensington school one teacher felt that "one could not use words as textbook, teach, curriculum, subject matter, and other special words." (Cited by Drew 1970:49).

Empirical studies also support my hypothesis that control in open space schools was as strong as ever:

[I]t appears that confirmation exists for the propositions that in open area there is (a) more access to the library, (b) greater interaction among pupils, (c) more movement, (d) increased experimentation with space and furnishings, and (e) more various activity. Partial confirmation may be given to the assertions that (a) there is less boredom in open space, (b) more variation in class sizes, and (c) more team teaching. Contradicted are the hypotheses, that in open areas (a) teacher-pupil interaction is greater, (b) independent study is more frequent, (c) less large instruction occurs, (d) more pupil questioning will be evident, (e) learning will be more active, (f) visitors will cause less disruption, (g) routines will be fewer, and (h) printed material will be used to the same extent as in regular classes. (Beeken-Janzen 1978:514)

The results show that few of the open space presumptions

were borne out by the study. The positive results were ambiguous in themselves. More movement and interaction may cover drills, especially if we take into account the fact that teacher-pupil interaction was not greater and learning was not more active in open areas than in traditional classrooms. Experimentation with space thus may indicate a desperate search for adequate solutions. Better access to the library simply does not mean anything in itself. Another study concluded that spatial openness and bureaucratic sophistication were weakly related, but

[I]t appears that contrary to popular expectations and beliefs facilitated by the disparity in the connotations of the term "open", there is likely to exist in open schools a tendency by school personnel to implement rules and standard procedures to control behavior and interaction formerly controlled by physical barriers. This suggests that open facilities are often new houses for old behaviors. Even though open space schools are thought to facilitate increased flexibility (in formal structure), it appears that open space indirectly facilitated functional rigidity rather than functional flexibility. (Laramy 1976:34)

Bennett et al. (1980) refer to numerous studies which have been carried out both in England and in North America which unanimously report the existence of closed schools in open spaces. Drew wrote in 1970:

I am forced to admit that the rationale for open space and the overoptimistic predictions that it would open up a new era of educational freedom and innovation do not seem to be borne out by the facts.

What went wrong and why? (Drew 1970:46)

Drew's last question is a mistake. Nothing went wrong; open spaces worked as they were supposed to work. They were not new houses for old behaviours but quite the opposite. They housed new behaviours but not the kind of new behaviours that theorists had promised. In order to reveal the superstructure of this new education, I will seek for open space patterns in other areas of social life, and extrapolate from systems thinking and open space in industry to education.

##### 5. Industry and Schools Revisited

I began this study with the comparison of factories and schools in the early nineteenth century. Now I will put schools and factories side by side again. Comparisons between schools and industrial production were common in the works of the progressives. Jane Addams in 1909, decades before the Human Relations movement, wrote:

"It takes thirty-nine people to make a coat in a modern tailoring establishment," she argued, "yet those same thirty-nine people might produce a coat in a spirit of 'team work' which could make the entire process as much more exhilarating than the work of the old solitary tailor, as playing in a baseball nine gives more pleasure to a boy than afforded by a solitary game of hand ball on the side of the barn." (Cited by Cremin [1961] 1964:63)

Helen Parkhurst was once travelling by train and was deeply touched by the words of a train official whom she talked to.

He said:

We used to suspend unsatisfactory workmen. Now we are trying to understand them and already we have far less trouble. ... [but still] the handling of the job belongs to the foreman. It is his duty to think for the gang. ... Yet how much the result would be improved if the labourer looked upon the job as his own and felt responsible for it. In that case the foreman would become a helper instead of a driver. (Parkhurst 1926:6-7)

This conversation helped her to arrive at ideas about an education which could be made more efficient by reducing the resistance of children:

Efficiency - the ratio of useful work to the energy spent in accomplishing it - may be increased by lessening the resistance, or by applying more power, and teachers have occupied themselves too exclusively with producing power. (Parkhurst 1926:10)

Nasaw suspected that the progressive idea of teaching children to work and play together was a response to industrial needs:

What was now needed was not self-made men and women but team players, individuals ready to sacrifice their personal dreams, hopes, and aspirations for the good of the productive unit. (Nasaw 1979:103)

We have seen earlier in this study that individuals were expected to sacrifice themselves in Prussia and were made to

fit into the social-industrial machinery in the nineteenth century England. What was new was the method:

[T]he modern economy demands an easily manipulated labor force in which operatives become interchangeable, those who have crystallized identities are not easily fit into a pre-set structure of interchangeable parts. (Larkin 1979:43)

When reading about an ever-changing world, hitherto never seen dynamism, the need for flexibility and adaptability in education, one should think of this industrial dynamism, flexibility and adaptability. The Prussian overtone to this was that workers were made to want interchangeability and flexibility. The new trend in the 1970s was to make jobs look more interesting and attempts were made to

[C]reate an atmosphere which would also give the workers a sense of identification, not just with earning their daily bread, but with each other and the firm for which they worked. (Nicol 1976:124)

It was thought that "ultimate efficiency is achieved when each employee is willing to give his or her best to the corporation" (Gyllenhammar 1977:17).

In modern times interesting comparisons can be found between industry and schooling just as in the age of the Industrial Revolution. The industrialist, for instance, saw the difference between the old and the new ideal of foreman in the following:

[The old] viewed their role as disciplinary, so notices from foremen were full of 'thou-shalt-nots' ... [While the new] foremen needed considerable training to regard themselves as information gatherers, as aides to the workers, as teachers and consultants rather than bosses. (Gyllenhammar 1977:19)

Viewing the problem from another angle:

His [the foreman's] function is like the teacher's in school: to judge performance rather than to perform himself; his power lies not in telling people what to do, but in recommending or deciding who works well enough to get merit increases, where personnel should be placed, who should be promoted and who fired, (Sennett 1972:100)

The designers of the famous Volvo experiment started out from their own previous experiences:

Whenever we have been seen as preachers, pushing a doctrine that is good for others, we suffered a boomerang effect. If our efforts to change the technical systems appear patronizing, the whole issue could die an untimely death. (Gyllenhammar 1977:69)

So in order to increase personal devotion of employees and also efficiency as a fortunate side-effect, they arrived at a conclusion similar to that of Parkhurst:

We need to find ways to personally involve each worker. Management cannot be based on power. In any show of power, the workers will "win" and the management will "lose", although the real result is, inevitably, that everyone loses. (Gyllenhammar 1977:6)

In an attempt to understand this quotation fully one must put the emphasis on the show of power, since later Gyllenhammar, one of the top men at Volvo, warned that the system calls for more strength instead of permissiveness on the side of management. The involvement of workers, extended only to technicalities; its range was always controlled by the management:

[P]eople working in the factory should be able to influence to some extent, the variation of the speed of their daily work and also that the personal environment within the factory would be improved by having open and free communication. (Nicol 1976:125)

Environment, openness and freedom - all familiar concepts for us. A further study of what designers thought about the project which started in 1974 in Kalmar, Sweden, will show that the meaning of these notions was somewhat similar to those used in education. In theory

Three phases can be identified in a development such as Kalmar, and they require different styles of management. In the first phase, it is the project leader who makes the technology work. If he or she fails, nothing has been achieved. In phase two, the employees become familiar with the technology and adopt it as their own. In phase three, the employees begin to take responsibilities for parts of the operations, and to exercise their own initiatives. (Gyllenhammar 1977:69)

This is the model for the development of a hyper-modern organization: professional authority gradually withdraws



until it is there only in its spirit, if I can use such a word in a scientific analysis.

The building in Kalmar, a two storey high construction of hexagonal clusters, was divided along the angles of the hexagons.

The area within each angle contains a group of workers and this is meant further to stress the illusion of a small workshop and to give the group its own identity. Each area possesses its own entrance, own changing rooms, showers and sauna and its own rest-room. (Nicol 1976:127 Italics mine)

As the purpose of clustering (using "bays" in schools) was to give the illusion of a community so was the result planned to be an illusion of identity. Workers identified themselves with the factory so deeply that they even phoned their colleagues who had not turned up for work and convinced them to come in. The groups, containing fifteen people each, were responsible for a relatively wide range of jobs the distribution of which depended on their own decision. The conveyor line moved the cars from one group to another but each group had a buffer containing two or three cars so that they could choose their own rate of working - within limits (Nicol 1976). They could have their lunch or cigarette break whenever they wanted. The most important aim was to give the feeling of freedom, independence and pride:

There is in addition a data terminal within every group area, enabling each team to check and communicate with central points for it is considered essential that the people on the floor can find out for themselves if any fault occurs and to be able to check and rectify it for themselves rather than 'just point a finger in its direction'. In this way, it is felt that the workers can take a justifiable pride in the 'quality' label that Volvo likes to keep high in its list of priorities, as they will feel that they have a much greater involvement. (Nicol 1976:128)

Freedom means to act in a rational manner. That is to choose from certain alternatives after due consideration. Possibilities cannot be recognized unless one knows what is impossible. It can be said that one is free when one recognizes the objective limits of one's actions. There is a great deal of truth in what Fichte and Pestalozzi said about freedom: freedom is the recognition of limits, a bowing to necessity. It is important though that if I want to be free, then I have to recognize my own limits rationally. This latter emphasis is very important because if I am not aware of the situation, if I do not have all the necessary information, then it will be impossible for me to be free. In modern societies and in modern bureaucracies it often happens that professionals manipulate facts and circumstances so as to make people to make decisions desired by the institutions. In the Volvo case people had the feeling of freedom when they could decide on certain alternatives. In fact, they were free to work better and more efficiently. So it can happen that although, indeed,

workers at Volvo had a wider range of possibilities of action than they had had ever before, the alternatives from which they were able to choose were offered by the "bosses". Circumstances had improved but the basic nature of the control remained the same.

User participation in planning educational facilities also resulted in startling projects. It seemed sometimes that control was passed over to the hands of the would-be controlled. Children were asked how would they shape their work spaces and even in elementary schools projects were developed for increased user participation. However, the innocuous words of a grade one teacher put these efforts into their place:

After we have discussed these problems [space arrangements in classrooms] for a bit, I asked the class if they thought there were ways we could make this a better classroom in which to learn. The children immediately said yes, and as I wanted them to feel it was their problem... (USMES Classroom Design 1974:C7-1-2 Italics mine)

Plate VI/9 shows the ten commandments of a playground built and operated by children - with the helping management of professional and non-professional adults. The rules prohibit everything that children like to do and adults hate them doing, with the probable exception of no. 10, which I doubt that any child would even think about. When Washburne (1932) described 'his' student government in Winnetka, the

pupils were engaged in a debate on "older boys snatching youngsters' hats" and on "the use of water pistols". After a short, but fierce debate, it was decided that nobody should snatch hats and water pistols should be banned because of the danger emerging from using possibly contaminated water. Yet another motion was put forward concerning drinking fountains and it was suggested that students should wait quietly if the fountains were occupied. Finally the author concluded: "Each meeting is conducted in a good parliamentary style until time for adjournment" (Washburne 1932:125). Student government had the right to do the disciplinary dirty job. In this way students felt that they exercise control over themselves and the teacher-Pilate's hands were kept clean. Modern authors, like Wilson (1981), obtained similar results when researching pupils' ways of self control. Wilson, who is a philosopher rather than a sociologist, found that every pupil he had asked "did not prefer existing disorder", 90% thought that "Discipline [was] not adequately enforced in schools" and 83% presumed that "Pupils would contract for enforcement" (Wilson 1981:52). It seems that by the increasing use of progressive methods in allowing pupils and workers a higher degree of flexibility in arranging their social and physical environment, they are made more and more willing to participate in controlling themselves. As work was 'free' within limits in Kalmar, so was discipline understood in

schools to be the

[P]rocess of achieving mastery of one's self and environment. ... It ... could be termed 'liberty within limits'. (Amos-Orem 1967:17)

These two innovative authors created another concept which aptly describes the idea. Our freedom, they said, is "creative conformity" (Amos-Orem 1967:16). Limits were set up in the interest of the students:

A learner who is not provided with the security which stems from evidence of limits in a particular situation may have to expend much energy and time needlessly in testing for limits - in seeing "how far he can go". A learner who knows generally the limits can proceed to focus his efforts upon meaningful tasks... Order brings freedom to create. To the degree an environment is chaotic, to that degree it is a negatively controlling one. (Amos-Orem 1967:19)

A child without discipline is not a free child. Therefore, although there is freedom of movement, they suggest permitting only one student at a time to leave the room and students should never leave their seats without permission. Teachers are also advised to supervise the arrangement of chairs and tables "to prevent abuse of flexibility" and to make seating charts to "reduce student confusion" (Amos-Orem 1967). With little ones it is wise to locate toilets in an open space in a way "to allow at least one teacher a view into each toilet" (Osmon 1971:56). Finally "It is a good practice to keep your desk locked when you are out of the

room." (Amos-Orem 1967:46). The ways of creative conformity are infinite both in number and kinds. Some authors prefer to give practical advice:

You hear a little voice asking, "May I go to the bathroom? May I get a drink of water?" Is it a real need? Say pleasantly, "Yes, you may go, but you'll have to make up the time you are out of the room." Many inquiries then change their minds about the trip. Still, you haven't said NO. Almost always, there'll be a few children for whom you'll have to make the decision. (McKellar Rogers 1972:121)\*

Something similar happened in Kalmar, where again the idea is not to say no. Other researchers suggest going back to old methods of behavioural modification such as the use of tokens, reinforced now by psycho-scientific-pedagogical language (Andersen 1974; Buckley-Walker 1970). If that does not work there is TO (time-out), "extinction" or even "stimulus satiation".

The method of time-out removes the child from a situation in which he can receive reinforcement. This differs from extinction in that the method of extinction removes the reinforcing stimulus rather than the child. (Buckley-Walker 1970:41)

TO is an euphemism for standing a child in the corner.

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* Etzioni (1964) quotes a piece of research which found that 90% of the reprimands in schools concern only a narrow stratum (5%) of the pupils. Authority is only obvious for those for whom the teacher has to make the decision, the others are 'free'.

Stimulus satiation is jargon for making a child write lines:

Satiation is the method of presenting a reinforcing stimulus at such a high rate that it is no longer desirable and may be aversive. Having a child write 500 times a dirty word which he had used is an example of the technique of satiation. (Buckley-Walker 1970:48)

The authors also mention the successful use of this method with mental patients, as if mental sickness was somehow part of the phenomenon of the "problem child".

Living in such an environment makes it hardly surprising that pupils participate 'willingly' in creating school rules. In a Massachusetts school children decided that they would like to participate in the flexible and dynamic creation of their environment for learning.

The principal told the children that he would seriously consider their recommendations for revising a rule if they could provide good evidence for the need. (School Rules 1975:14)

The high school students wanted the privilege of free Friday afternoons which they got after long negotiations and with the reservation that they had to stay in longer on weekdays.** The process cannot but remind us of the Volvo

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 \*\* The students initially wanted a Coke machine but the company turned down their request because of previous vandalism in the school. Then they voted for free Fridays...

experiment. In another case elementary pupils wanted to have some influence on the life of the school. So,

[T]he teacher writes on the board the challenge, "How can we inform and remind children about the school rules" (School Rules 1975:21)

This set the tone for the whole project: children organized patrols, prepared charts and reports, drew posters which encouraged fellow-students to keep the rules. Only two of the less trained members of the community filed a complaint to the principal about some rules which they thought were unnecessary. One concerned a ban on pets in classrooms and the other prohibited children from wearing hats in the school. "Several weeks later" the principal came around and said that

He felt that both animals and children would be healthier if the animals were kept in the science room where a few animals were presently kept. He also felt that under these controlled conditions, any animals that escaped would be restricted to only one part of the school. He then revealed his reasons for the "no wearing hats in the school building" rule. He confessed to the class that he was a bit old fashioned and strongly felt that it was disrespectful for children to wear hats in a public building. The children listened attentively as the principal spoke. They were quite satisfied with his reasons, and after he left, they voted to retain the two rules as important school rules. (School Rules 1975:39-40)

One might argue that these are unrepresentative examples, of old methods still existing but I think schools of today look



different and act differently upon people from those of old, in a way that is little understood. As the observers in Kensington School noted:

[S]uch glowing words as "facility and speed, mobility and flexibility", while rallying cries for emotional appeals, the actuality is much more lack of facility and speed, mobility and flexibility." (in Drew 1970:48)

Flexibility and mobility are concepts which imply limits and hidden control in themselves. They are guardians related to systems thinking: flexibility and mobility exist within limits. One architect put it this way: minimum flexibility is present in a concrete room where you cannot even hit a nail into the walls, while maximum flexibility exist where there is no building whatsoever (School and Community 1976). Thus flexibility and mobility imply a set of rules which give them practical meaning. They are the notions of the hidden curriculum, if you wish. Flexibility and open space do not shine as nicely today as they did ten years ago. The Volvo experiment failed and workers at Kalmar work on conveyor lines again. One possible reason might be that recession proved an effective means of subduing restless workers and the future unemployed, more effective than workers' involvement. Perhaps the rising awareness of students played a role in the failure of self-government in schools:

When given the alternative of voluntary participation in school activities without coercion, students would rather not participate. The Great Refusal is the negation of the liberal assumption: If students are given greater freedom to choose within a formal structure, they will be thankful for the opportunity to select from administratively determined alternatives ... Most students view school as inherently coercive. Therefore any participation in school activities is participation in one's own oppression. (Larkin 1979:148)

## 6. Summary

The 1960s and 70s were two decades when education was under constant fire from sociologists and deschoolers. Interestingly enough it seemed that educational institutions gained more and more confidence in themselves. In their programs schools went as far as to allow pupils to have a word in what should be taught and how. There must have been something that insured educators that children would select whatever the teachers wanted to teach. Systems thinking in educational theory and architectural practice helped to make control almost invisible. The less apparent nature of authority resulted in self-deprecation among students. There seemed to be nobody issuing orders, nobody to blame and hate for the feeling of still being at the bottom. When industrial workers and school pupils felt bad in their open workshops and open space schools, and it seemed that they could modify the situation only if they bestirred themselves, they started to blame themselves (See: Sennett

1972). In this chapter it has been argued that open space or spatial flexibility is a device for maintaining a hidden control. Masquerading as science, old methods revived and became elements of the new system. This is to say that although schools changed substantially in their appearance in the past one and a half centuries, the developments were basically methodological; the ways and means of schooling changed but one of its fundamental functions, to control children and to teach them to accept control, did not.

## CHAPTER SEVEN

### Counterargument

But perhaps I am wrong. How can anyone say that schools have not changed in their basic function? It can easily be proven that methods of teaching have improved and that life in schools is more human today than earlier. In the first place schools are healthier than they were. New school buildings provide ample space for each child; lighting and ventilation are better than in nineteenth century schools. Schools have taken over several duties from the family, such as providing meals, cultural programs, and extra-curricular activities. Besides these improved material conditions, the quality of life in schools has changed as well.

The harsh, military discipline is disappearing from schools which are becoming a friendly place for both teachers and students. So schools are better now than they were in earlier times, surely? Yes indeed. But my argument has

been descriptive rather than evaluative. Educators have seldom denied that elementary schools are coercive institutions.

My concern has been with the methods they use, in exercising their power. It would be extremely difficult to measure to what extent children were more or less controlled in nineteenth century schools than they are now. Indeed, it seems that the young were more disciplined and oppressed in old times, as workers were probably more exploited in Strutts' mills than at Volvo in Kalmar. There are no indicators to measure this. Physical punishment was more common a hundred years ago than today, but of course cruel punishment has disappeared from other spheres of social life as well: military and penal institutions, asylums and even work places. One may look at physical punishment from a functionalist's viewpoint: What aims were in the minds of teachers strapping their pupils? What was the overall philosophy backing up this practice? If one seeks answers to these questions then one may glimpse aims and fragments of certain philosophies recurring in the history of education. Methods of physical punishment and of psychological control are only different manifestations of the same ideas. The methods used are characteristic of the historical period rather than of education or schools.

Perhaps a provocative part of my thesis is that dealing with twentieth century schools. This was the time when

increased concern with children's interest and psychological traits characterized the work of educators. It was this wave of educators who came to understand that healthier schools and more civilized conditions may mislead. In fact, Dewey and others worked hard to develop the theory and practice of a democratic school system where children were to learn to be free and to be resistant to manipulation. The free school movement, which I omitted from my study, went so far as to question institutional education. They tried the almost impossible: to make school a nonformal institution and so to develop a noncoercive general education. In free schools students and teachers created the curriculum and established the internal order of the school together with the help of parents. Perhaps the spectacular failure of these schools has hinted us that schools are inherently formal organizations and as such they force their clients to keep the rules created by professionals one way or another.

As to the research methodology used in this thesis, several alternatives can be mentioned some of which might have been used with success. Most traditional histories of education usually present schools as the result of some linear development. They start from the Greeks or some primitive societies, or perhaps Egypt and then they go to Rome, then to Medieval Europe and stay on the Old Continent until about the time of the American progressives. The

thread of thought in these works is that history, in general, is the cultural evolution of mankind: it is a selective and adaptive process in which strong elements survive and weak cultural mutations die away. Historians select the most advanced culture of an age and discuss it as a model for further development. Now it can be argued that there is little connection between the ancient Egyptian, the Athenian concept of schooling and that of the Medieval monks. Development may be thought of as an illusion brought about by the retrospective selection of trends which somehow point to the present situation. There cannot be, of course, a history of education which is not selective in one way or another. My own chapters have stressed some developments and neglected others. I compare schools of the last century not to schools of today, but to contemporary industrial production and the military. I compare Lancastrian schools to factories and the Prussian rural school system to military organization. Would the comparison with English military organization and Prussian production not have brought different results? The selection of subjects for comparisons was based on the idea that I would analyse the innovations of a certain era. There were, of course, other kinds of schools in early nineteenth century England than Lancastrians as well as other production units than cotton mills. The same can be said of Prussia. Revolutionary thoughts were, however, represented by Lancaster, by steam

engine mills, by Prussian military organization and by the state owned system of Prussian schools.

There is another possible approach to writing a history of school architecture. Burchell's (1980) or Seaborne's (1971a,b;1977) works are token examples of the research method in which the analyst chooses to study developments in school building through the examination of a large sample of plans and actual buildings. The advantage of this method is that real buildings have atmosphere; the feel of a school desk, the smell of a floor polished and worn into patterns by generations of children's feet. This may lead to a deeper understanding of architectural ideas about educational facilities.

Analysing actual buildings has another advantage over the method I have used. The research is anchored in palpable reality, spaces are analysed which are awesome or petty, buildings described which are considered to be beautiful or ugly, and schools are discussed from the viewpoint of the users. These studies are either based on the study of buildings set in their architectural environment or on a subjective but passionate evaluation with great concern for the people who use them.

The analysis of buildings may be pursued according to still other methods. One of these is based on the psychology of human perception. Luning Prak (1968), for example, talks about architectural concepts which seem to be



universal. The most important concepts for him in describing architectural forms are: proportion, size, angularity, plasticity and isolation. While talking about architectonic structure he uses the concepts of homogeneity and continuity, and in analysing spatial compositions he considers position (location and connection) and similarity to be keywords. By using these concepts in analysing spaces the researcher may develop a solid and consistent framework in evaluating any architectonic form. A similar approach is taken by Preziosi (1979) who conceives architecture to be comparable to language. Consequently, he develops a complex system of 'structural linguistics' applied to architecture where architectonic 'morphemes' and rules of 'generating syntaxes' are described.

Just as I may have been quite wrong in my way in my approach and in my method, so I may have been quite wrong to base my argument on the notion of "control". The fundamental concept of the thesis, 'control', seems to be elusive. To identify control poses the first problem. According to my interpretation control is a universal characteristic of any social system. Yet, as I pointed out earlier in this chapter, it is hardly possible to measure the degree to which it is present - partly because the idea is so slippery. The common use of the word 'control' implies the restrictive action of a person or a group upon others. The argument in this research runs counter to the

dictionary definition of the word. The Oxford English Dictionary gives the following applicable definition: "To exercise restraint or direction upon the free action of; to hold sway over, exercise power or authority over; to dominate, command" (The Oxford English Dictionary Vol. II. 1933:927). My thesis argues that there is more to control than overt restraint, regulation or exercise of authority. It may easily be the case that I have mistaken 'control' for something else because I refrain from discussing who is controlling whom in education. It is possible to interpret control as being a device similar to that of the autopilot in an aeroplane which secures the smooth and safe operation of the plane by recognizing obstacles and changes in the surrounding conditions and adjusting the operation of the whole system accordingly. In this case control is self-regulation rather than restraint from without. In social context the question may seem even more complex for it is not immediately clear who programmed the controlling device. An analogy may throw light on the problem. Language, another socially constructed and well identified subsystem of human societies, also contains several rules which secure its 'safe operation', i.e. to make us able to understand each other. Many have argued that language controls us. But still, is there control in society or is there not? If we talk about self-regulating, homeostatic subsystems in society is it not trivial to point out that

they work according to similar principles? Who would think of having Lancastrian schools in twentieth century American society or vice versa, a Volvo-type industrial plant in nineteenth century England? To prove that educational theory and school building practice were and are subject to similar thought patterns may be a spectacular enterprise but in itself it may contribute little if any to the better understanding of education. One possible escape from this dilemma is to define control in terms of an epistemological grid we use when thinking about education. This grid of thoughts may be defined by asking questions like: What is it acceptable to do in schools? What is desirable? What are the implications of certain concepts? Thus we may obtain a set of principles and values which rule the discourse on education, in which case it may be spurious to refer to another subsystem, school architecture. Perhaps in truth it is a circular argument to refer to educational theory when talking about school buildings and, conversely, to use architectural analysis in order to point out controlling aspects in philosophy. But cybernetic systems are by nature recursive.

Even supposing that there is a controlling mechanism at work in education, we must answer the question: What relevance does this control have in our lives? The majority of teachers, administrators, parents and students readily accept the rules of the education game. Wilson (1981)

points out that there is a strong need for legitimate rules among students. They prefer having control to having none. Several free schools were forced to give up their initial principles and drifted toward the traditional school model because neither parents nor pupils could cope with license. Now, are students the victims or the makers of control? One might say that they are indoctrinated or manipulated to accept or even desire control but to verify this statement is almost impossible. Sooner or later schoolchildren or subservient populations shake off the yoke of unwanted control - just to substitute it with another. People who are subject to schooling seldom manifest any intention to do away with control itself.

But let us presume that students do not like control. At first glance it seems that they are controlled by their teachers, who are under the strict supervision of the principal, who, in turn, is accountable to the schoolboard or some other kind of professional-political authority. The chain seems to end at governmental level but the failure of countless state-initiated educational reforms indicates that ministries of education, in reality, do not exercise full control over the system they are thought to direct. Moreover, in the present situation the should-be controlled make the elimination or arbitrary changes of control virtually impossible: the young in our society 'ask' for certain methods of control by their attitudes and behaviour.

Teachers' performance and values affect the ways educational administration may be able to direct them. Methods of control are reified in material conditions, in buildings.

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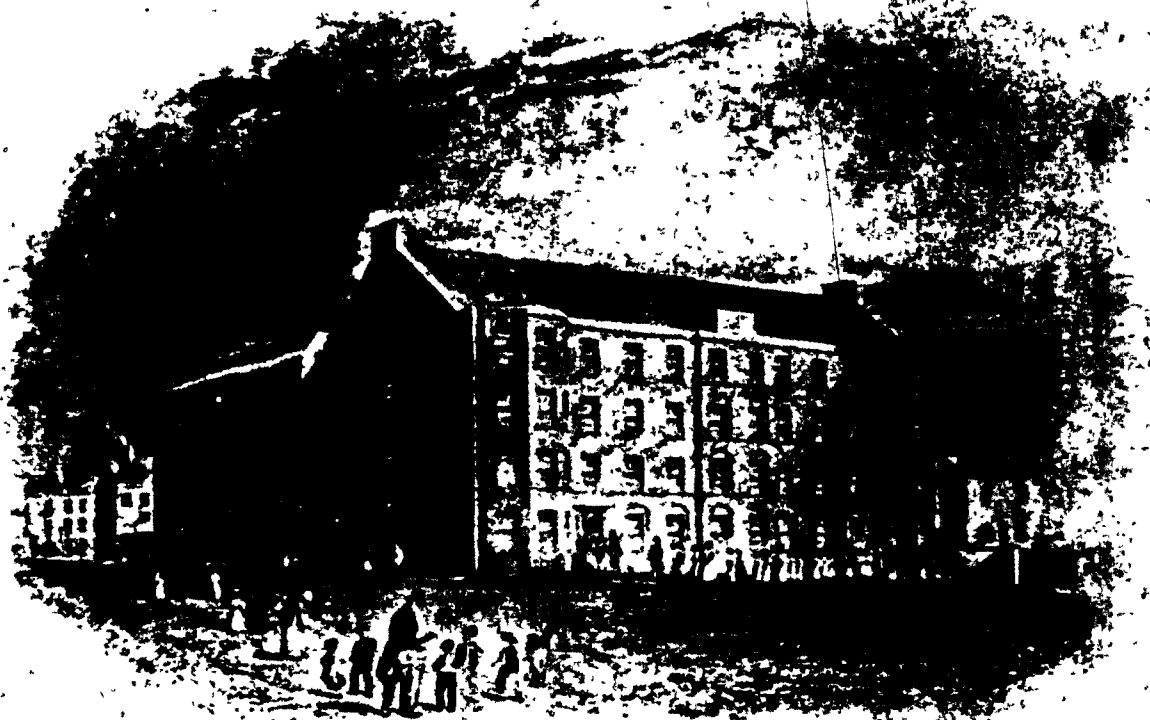
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A P P E N D I X

P L A T E S



*Perhaps those who commissioned this idealized representation of the Stockport Sunday School wanted to convey the impression that it was like a great country house set among open fields. They would, by analogy, assume the role of the benevolent squirearchy. In fact the building was squeezed tightly on a hill overlooking factories and a railway viaduct*

(Source: Laqueur 1976)

Stockpprt Sunday School

Plate I/1



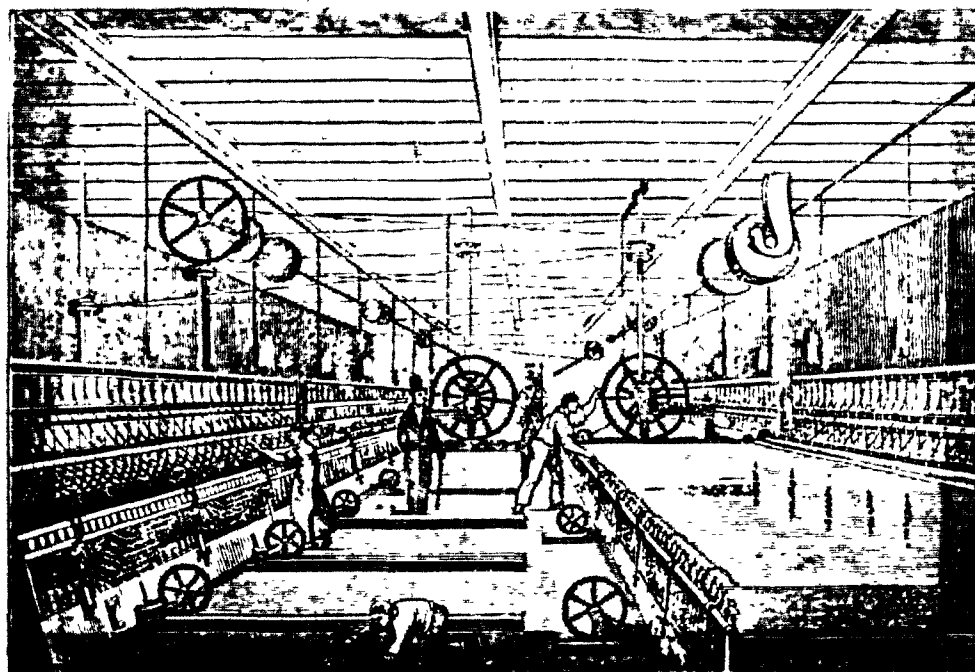
Mule spinning in a cotton mill. (Source: Huggett, 1973)

In the first place, he has located the mules in the attic story, and has illuminated them with sky-light windows, in order to show off the cast-iron framing of a factory-roof. Now, mule-spinning requires horizontal light, and is never carried on in the garrets of modern mills. These are reserved for preparation, winding, warping, doubling, web-dressing, &c. Secondly, the piecers are there figured joining the broken threads, when they are five feet distant from the roving ends, and would therefore need to have arms at least six feet long for the purpose. The moment a thread breaks, the one end curls about the drawing-roller at the fixed beam, and the other round the top of the spindle in the carriage; so that in the position of the carriage in that picture, there would be an interval of about five feet between the broken ends. Thirdly, the adult spinner is exhibited as busy with the copping-wire of the mule before him; where he has no business to be; for its carriage is in the act of coming out upon the automatic principle; while he ought to be then standing close by the headstock of the opposite mule, ready to return its carriage by the operation of the one hand and to guide the fuller-rod by the other, in winding the yarn of the finished stretch upon the spindles.

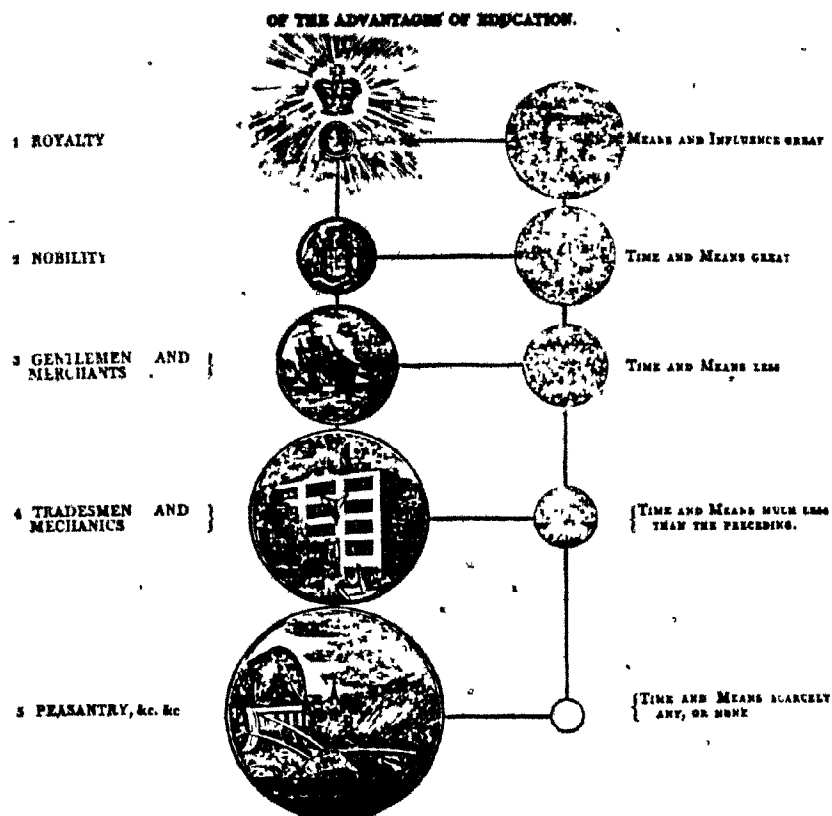
In fact, the whole train of operations has been curiously travestied in that engraving. Mule-spinning as there shown off, would be the incessant slavery which Mr. Sadler's partisans described it to be, like the labour of the Danaides, never ending or suspending. Whereas the spinner has nothing to do, while the carriage is slowly drawing and spinning the thread; and the piecers have nothing to do, either during the coming out or going in of the carriage, but they should seize the moment of its proximity to the roller-beam to mend the broken ends, and missing this period, they must remain idle till the completion of another act of stretching and winding off. Were the young persons seen in such positions at such times, they would get a sharp rebuke from the spinner, or more probably be dismissed by him for egregious stupidity.

(Source: Uré [1835], 1967)





Mule spinning, according to Ure. (Source: Ure [1835] 1967)



An early nineteenth century estimate of the need for education by the various social classes. (Source: Thut 1957)

FACTORY EDUCATION TABLE.

| ENGLAND.                          | Numbers taken from the Returns. |              |        |               | Proportion in the hundred. |              |        |               |
|-----------------------------------|---------------------------------|--------------|--------|---------------|----------------------------|--------------|--------|---------------|
|                                   | Read.                           | Cannot read. | Write. | Cannot write. | Read.                      | Cannot read. | Write. | Cannot write. |
| Lancashire - - -                  | 11,393                          | 2,344        | 5,184  | 8,553         | 83                         | 17           | 38     | 62            |
| Cheshire - - -                    | 3,092                           | 344          | 1,630  | 1,806         | 90                         | 10           | 47     | 53            |
| Yorkshire - - -                   | 9,087                           | 1,616        | 5,194  | 5,509         | 85                         | 15           | 48     | 52            |
| Derbyshire - - -                  | 2,490                           | 314          | 1,200  | 1,604         | 88                         | 12           | 43     | 57            |
| Staffordshire - -                 | 3,530                           | 718          | 2,603  | 1,615         | 83                         | 17           | 61     | 39            |
| Leicestershire - -                | 351                             | 92           | 174    | 269           | 80                         | 20           | 40     | 60            |
| Nottinghamshire -                 | 948                             | 127          | 455    | 616           | 88                         | 12           | 43     | 57            |
| Norfolk, Suffolk, Essex - - - - - | 1,914                           | 433          | 608    | 1,739         | 81                         | 19           | 26     | 74            |
| Wiltshire - - -                   | 3,045                           | 527          | 1,364  | 2,208         | 85                         | 15           | 38     | 62            |
| Somersetshire - -                 | 2,010                           | 229          | 591    | 1,678         | 89                         | 11           | 26     | 74            |
| Devonshire - - -                  | 755                             | 34           | 401    | 386           | 96                         | 4            | 51     | 49            |
| Gloucestershire -                 | 4,550                           | 379          | 1,983  | 2,952         | 92                         | 8            | 40     | 60            |
| Worcestershire -                  | 21                              | —            | 16     | 5100          | —                          | —            | 77     | 23            |
| Warwickshire - -                  | 105                             | 15           | 81     | 39            | 88                         | 12           | 68     | 32            |
| Total - - -                       | 43,327                          | 7,170        | 21,488 | 29,009        | 86                         | 14           | 43     | 57            |
| SCOTLAND.                         |                                 |              |        |               |                            |              |        |               |
| Aberdeenshire -                   | 4,336                           | 305          | 2,133  | 2,508         | 93                         | 7            | 46     | 54            |
| Forfarshire - - -                 | 4,879                           | 237          | 2,425  | 2,691         | 95                         | 5            | 47     | 53            |
| Perthshire - - -                  | 1,601                           | 96           | 1,054  | 643           | 94                         | 6            | 62     | 38            |
| Fife - - - - -                    | 1,558                           | 38           | 862    | 734           | 97                         | 3            | 57     | 43            |
| Clackmannanshire                  | 213                             | 6            | 754    | 65            | 97                         | 3            | 70     | 30            |
| Stirlingshire - -                 | 795                             | 23           | 547    | 271           | 97                         | 3            | 66     | 34            |
| Lanarkshire - - -                 | 7,815                           | 317          | 4,454  | 3,678         | 96                         | 4            | 54     | 46            |
| Renfrewshire - -                  | 5,664                           | 199          | 3,165  | 2,698         | 97                         | 3            | 54     | 46            |
| Ayrshire - - - -                  | 867                             | 2            | 594    | 275           | 100                        | —            | 68     | 32            |
| Bute - - - - -                    | 430                             | 4            | 310    | 124           | 99                         | 1            | 71     | 29            |
| Mid Lothian - -                   | 98                              | 3            | 96     | 5             | 97                         | 3            | 95     | 5             |
| Total - - -                       | 28,256                          | 1,230        | 15,794 | 13,692        | 96                         | 4            | 53     | 47            |

(Source: Ure [1835] 1967)

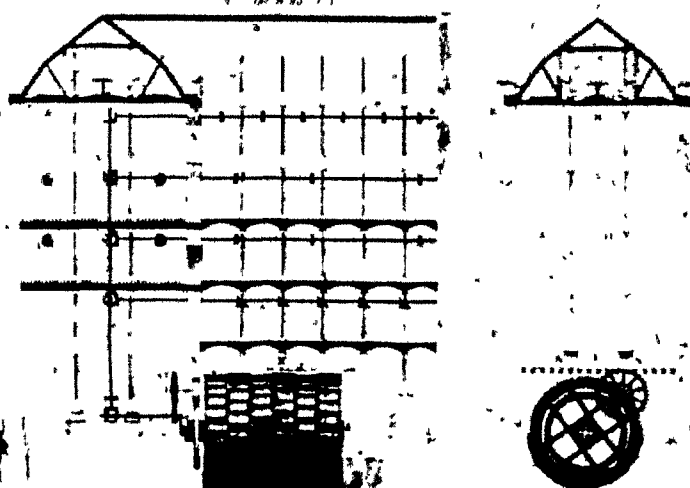
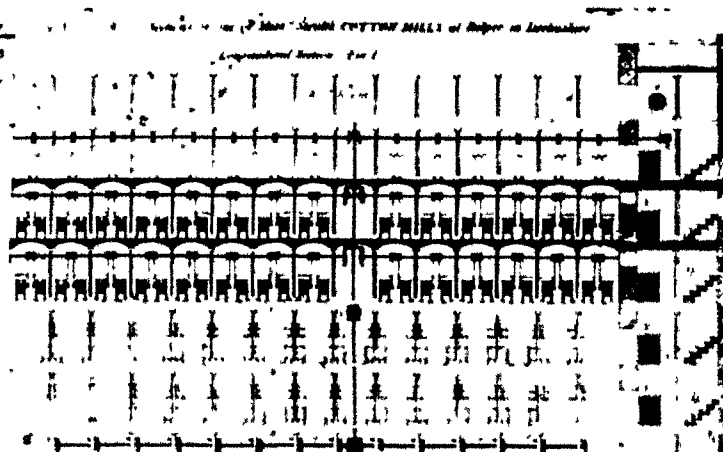


Woman spinning at home.

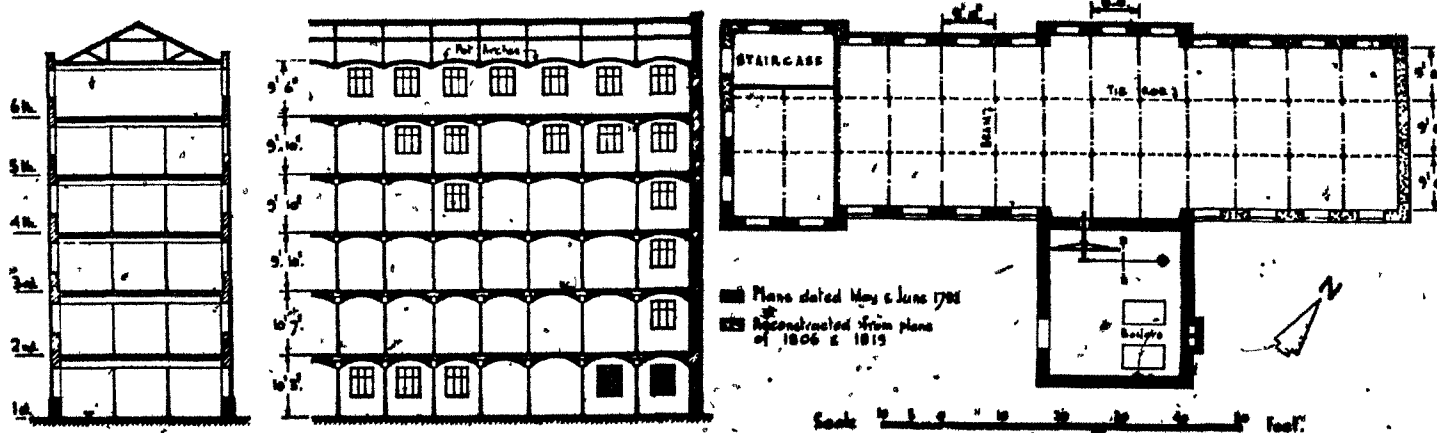


Hand-loom weaving, 1801.

(Source: Huggett 1973)



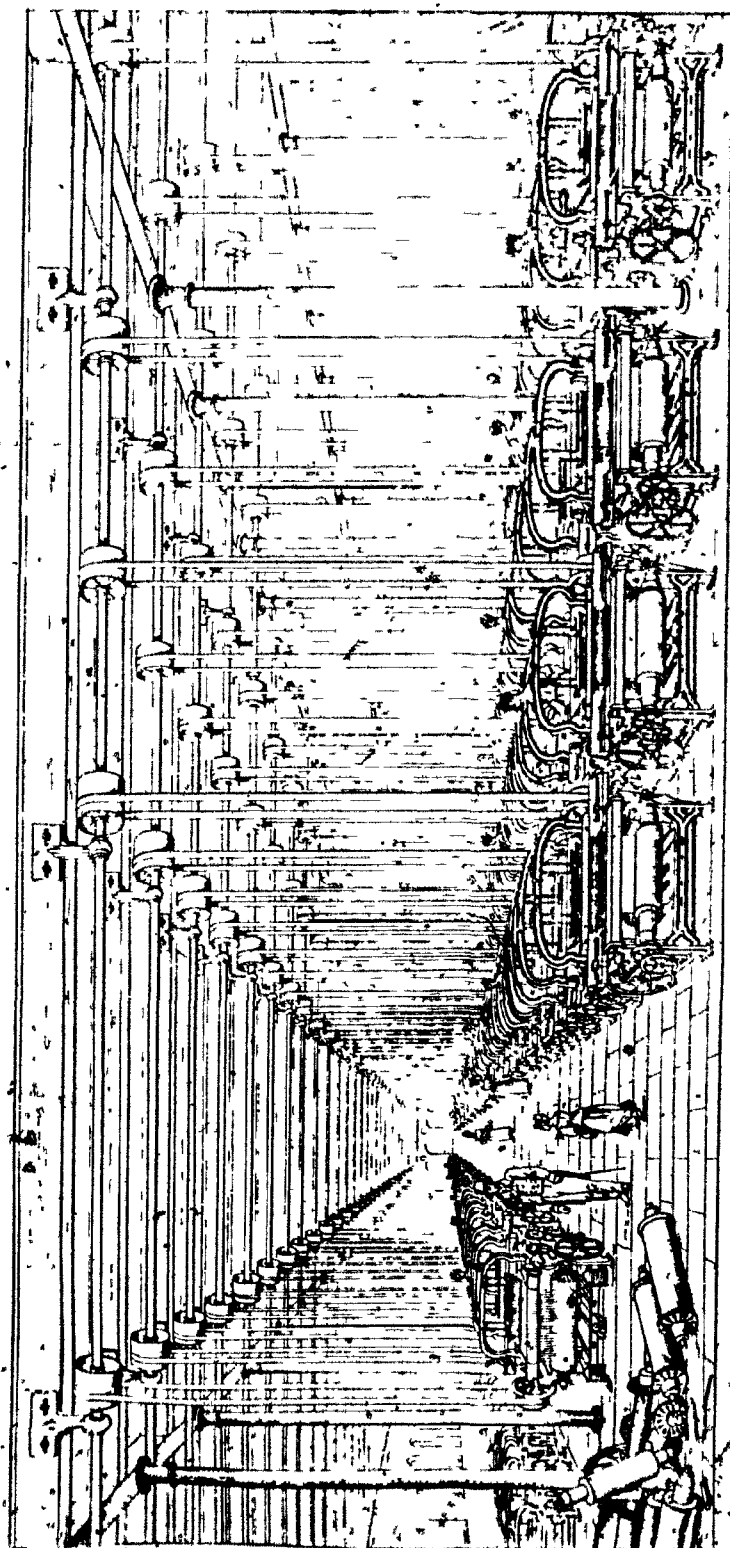
Belper North Mill, 1803-4, Section.



The Derby Mill, 1792-3. (Source: Fitton-Wadsworth 1958)



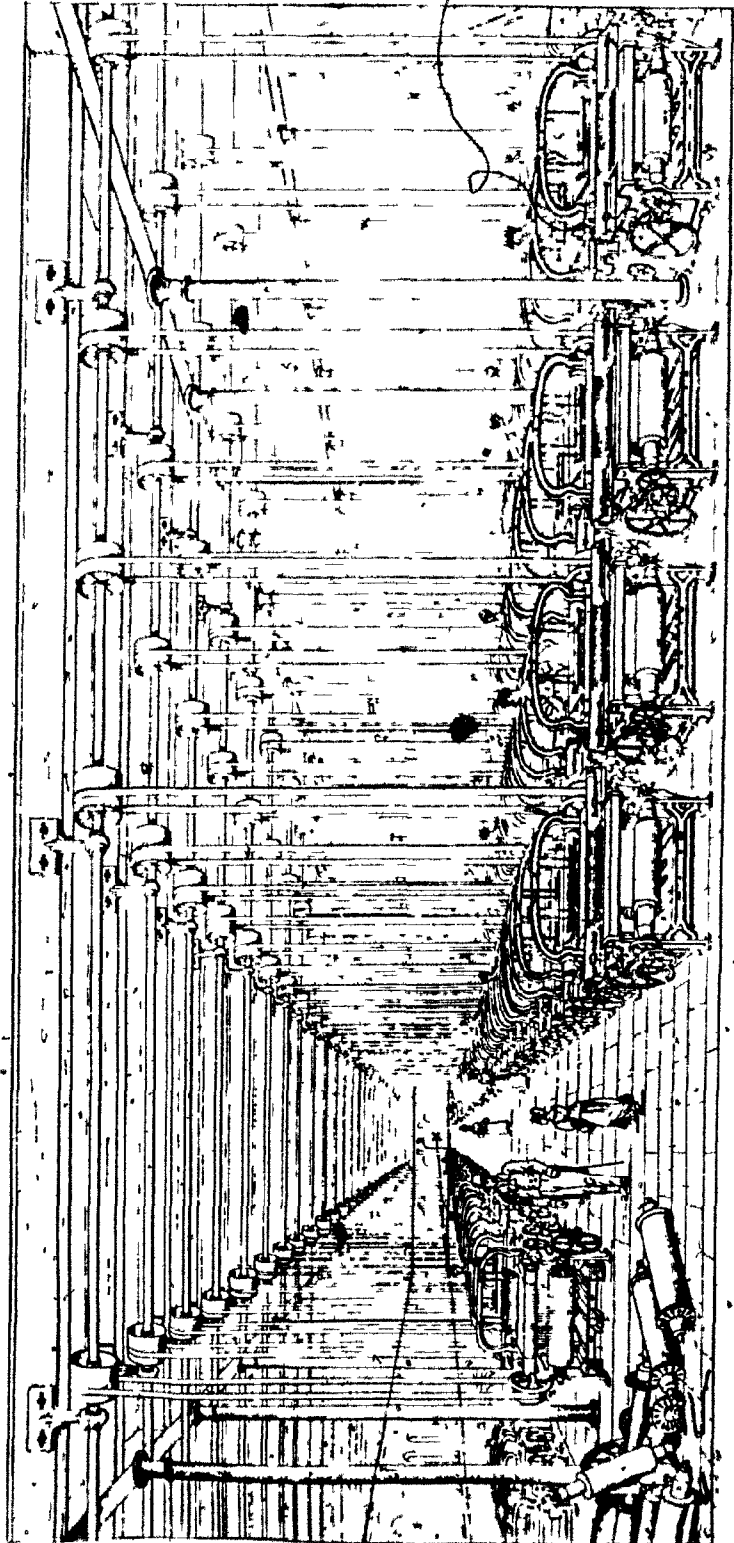
Early mill. (Source: Huggett 1973)



POWER LOOM FACTORY OF THOMAS ROBINSON ESQ.  
STOCKPORT. A 4

(Source: Ure [1835] 1967)

plate IT/6

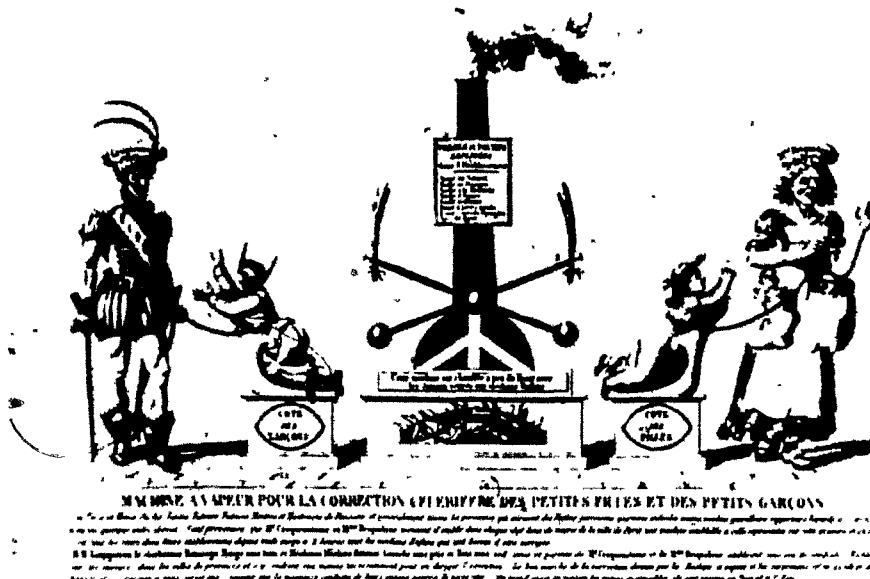


POWER LOOM FACTORY OF THOMAS ROBINSON ESQ.  
STOCKPORT.

distortion of space. The dotted line shows where the floor level should be. (Source: Ure [1835]  
1967).

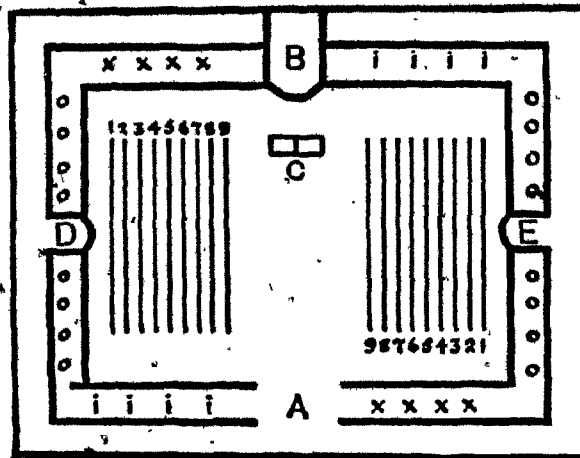
plate II/7





Steam machine for the 'celeriferous' correction of young boys and girls. 'Fathers and Mothers, Uncles and Aunts, Guardian Masters and Mistresses of boarding schools and all those who have lazy, greedy, disobedient, rebellious, insolent, quarrelsome, tale-bearing, chattering, irreligious children, or children having any other defect, are hereby informed that Mr Bogeyman and Mrs Bricabrac have just set up in every *mairie* of the city of Paris a machine similar to the one represented in this engraving and are ready to accept all naughty children in need of correction in their establishments each day, from midday to two o'clock. Mr Werewolf, Coalman Scarecrow, Eat-without-Hunger and Mrs Wildcat, Spiteful Slag and Drink-without-Thirst, friends and relations of Mr Bogeyman and Mrs Bricabrac, will, for a small sum, set up similar machines to be sent into provincial towns and will themselves supervise their operation. The cheapness of correction given by the steam machine and the surprising effects that it produces will persuade parents to avail themselves of it as often as the bad behaviour of their children will require it. We also take incorrigible children as boarders: they are fed on bread and water.' Engraving of the late eighteenth century (Collections historiques de l'I.N.R.D.P.).

(Source: Foucault [1975] 1977)



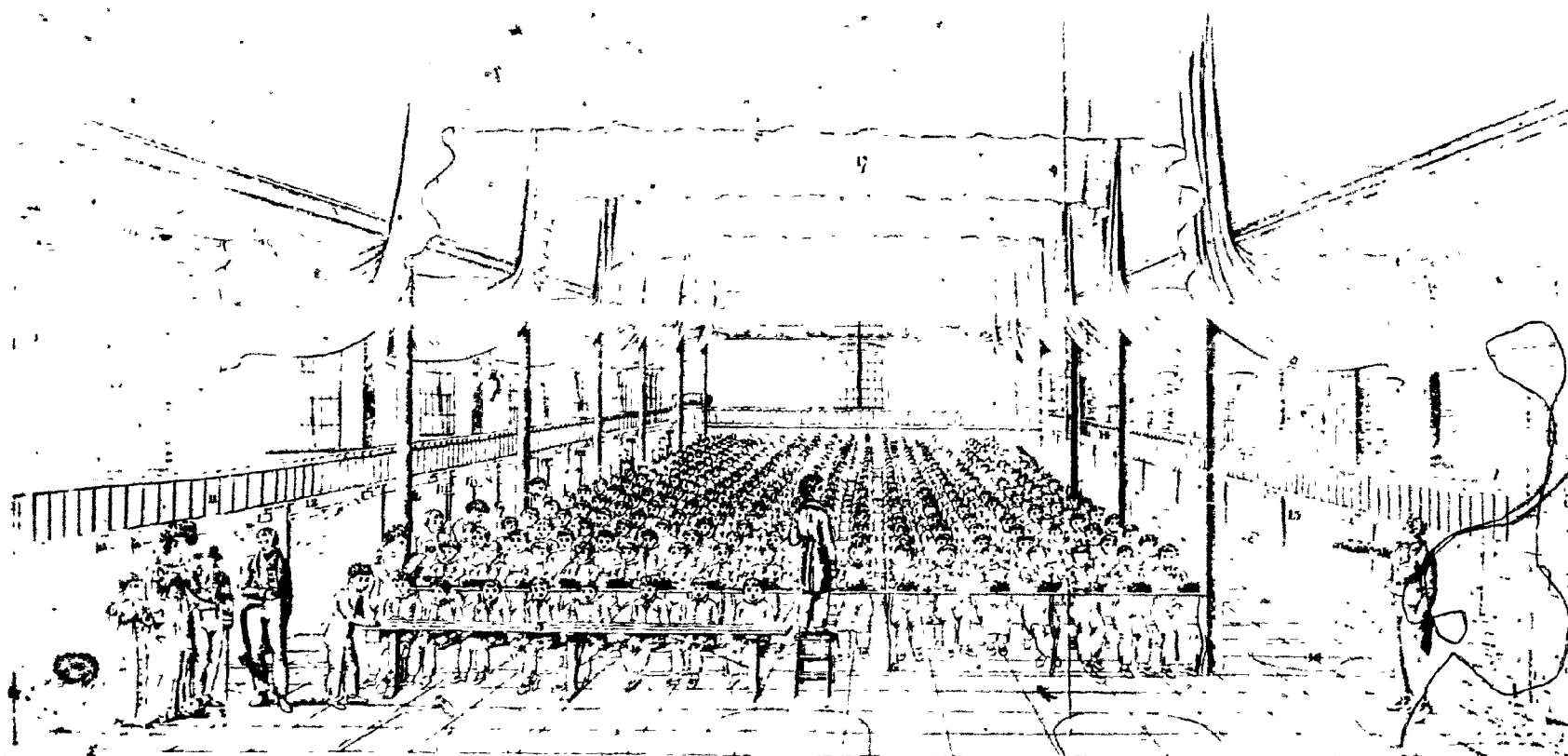
Plan of a Jesuit schoolroom of the seventeenth century. B represents the teacher, C the monitors, and D, E, O, X, and I various student officials. The numbered lines represent rows of students, known as *decuriae*. When a student was called upon, his "rival" arose from the corresponding place in the other group; and, as each recited, the other endeavored to correct him in some error.

(Source: Graves [1915] 1970)

## List of figures in Plate II/10

1. General monitor of order.
2. Monitors of classes.
3. First class, or sand class. Pupils wrote in sand.
4. Writing desks in varying heights.
5. Forms. Also vary in height.
6. Iron supports.
7. "Standards. The breadth of the desk, and rising eighteen inches above it. They are firmly fixed in the ground. From these the class marks and battledores are suspended."
8. Telegraphs.
9. "Slates. Now exhibited for inspection."
10. "Battledores. Containing the words to be written from dictation."
11. Lessons not in use.
12. Rails from which the lessons are suspended.
13. "First boy badges. To be held by the first boy in the draft."
14. "Class lists for mastering."
15. Pointers.
16. "Draft stations. The lines are cut in the floor: the form is that of a semicircle of a radius of two feet, connecting the ends of two perpendiculars of eighteen inches."
17. "Baize. To check the reverberation of sound."

BRITISH SYSTEM OF EDUCATION.

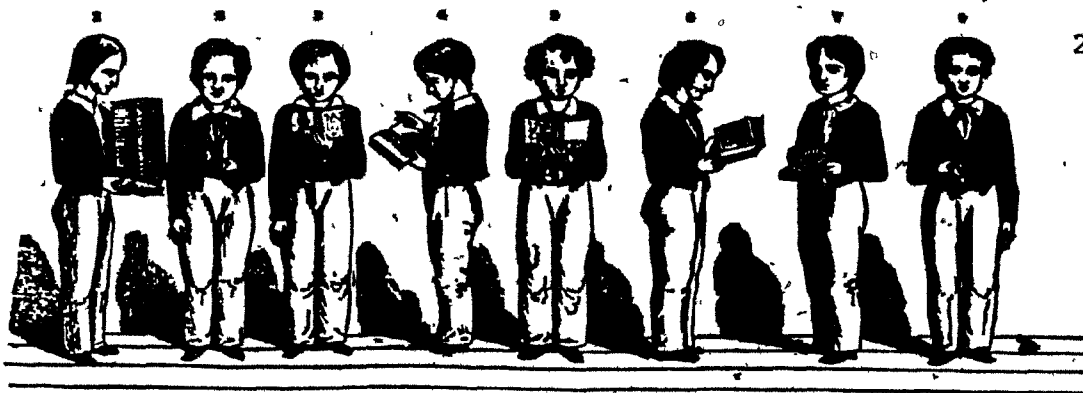


INTERIOR of the CENTRAL SCHOOL of the BRITISH & FOREIGN SCHOOL SOCIETY, DOROTHY ROAD.

Plate II/10 (Source: Manual... 1837)



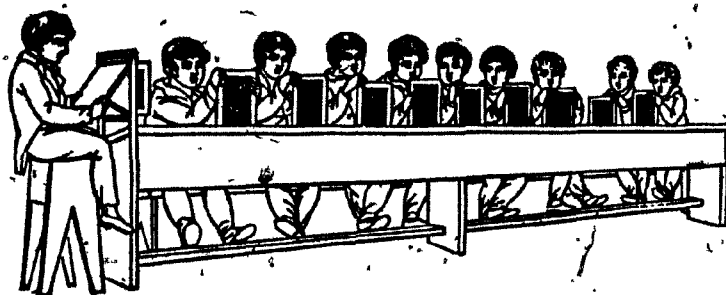
London school, 1818. (Source: Lange 1967)



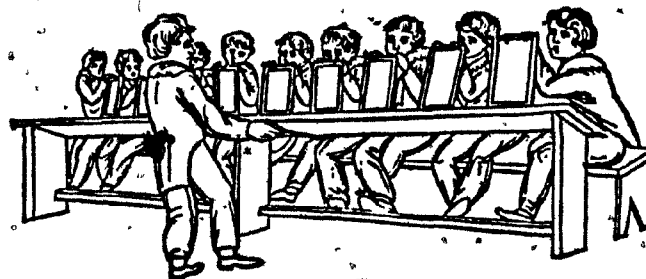
BOOK MANUAL.  
(Source: Reigart [1916] 1969)

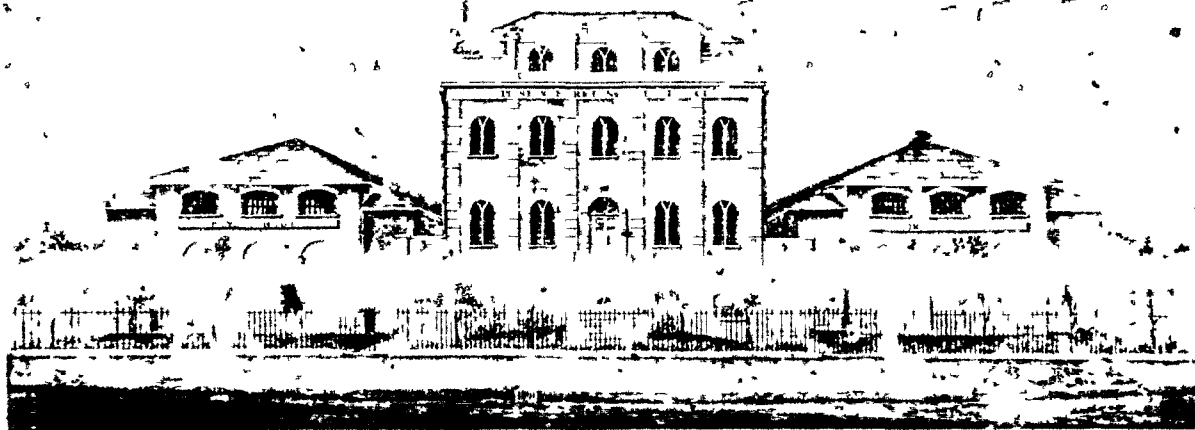


(Source: Lange 1967)

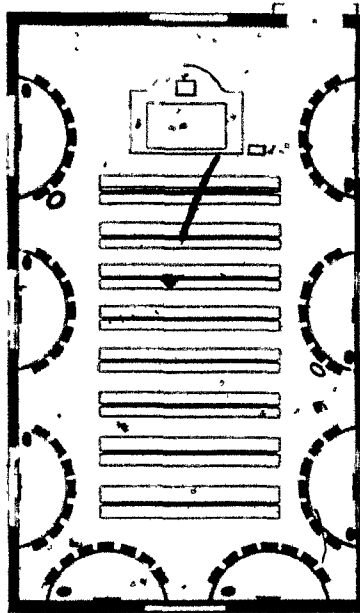


(Source: Reigart [1916] 1969)

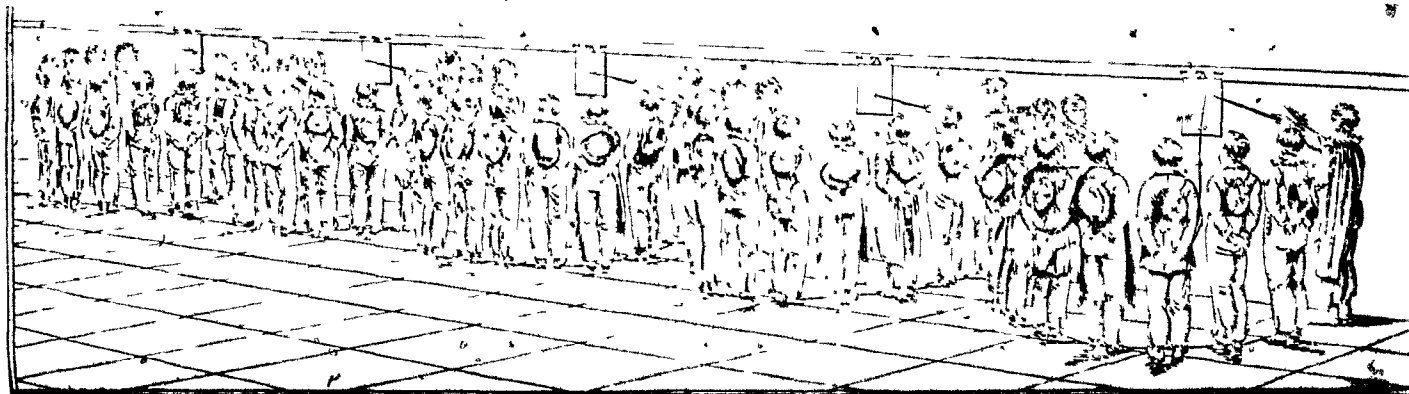




Model school of the British and Foreign Society, Borough  
Road, Southwark. (Source: Manual... 1837).

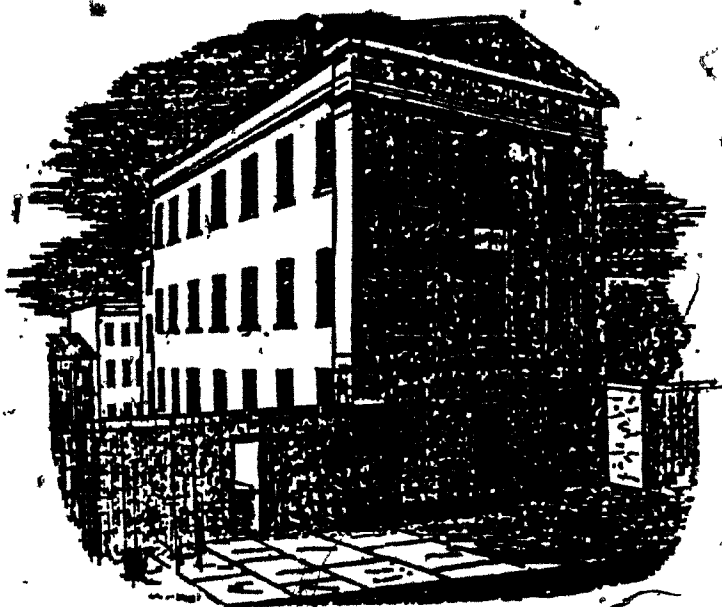


(a) Table; (b) Platform; (c) Chair for the Master;  
 (d) Place for the general monitors. Monitor generals  
 are signed by empty circles, monitors by shaded circles,  
 and pupils by shaded rectangles. (Source: Lange 1967)

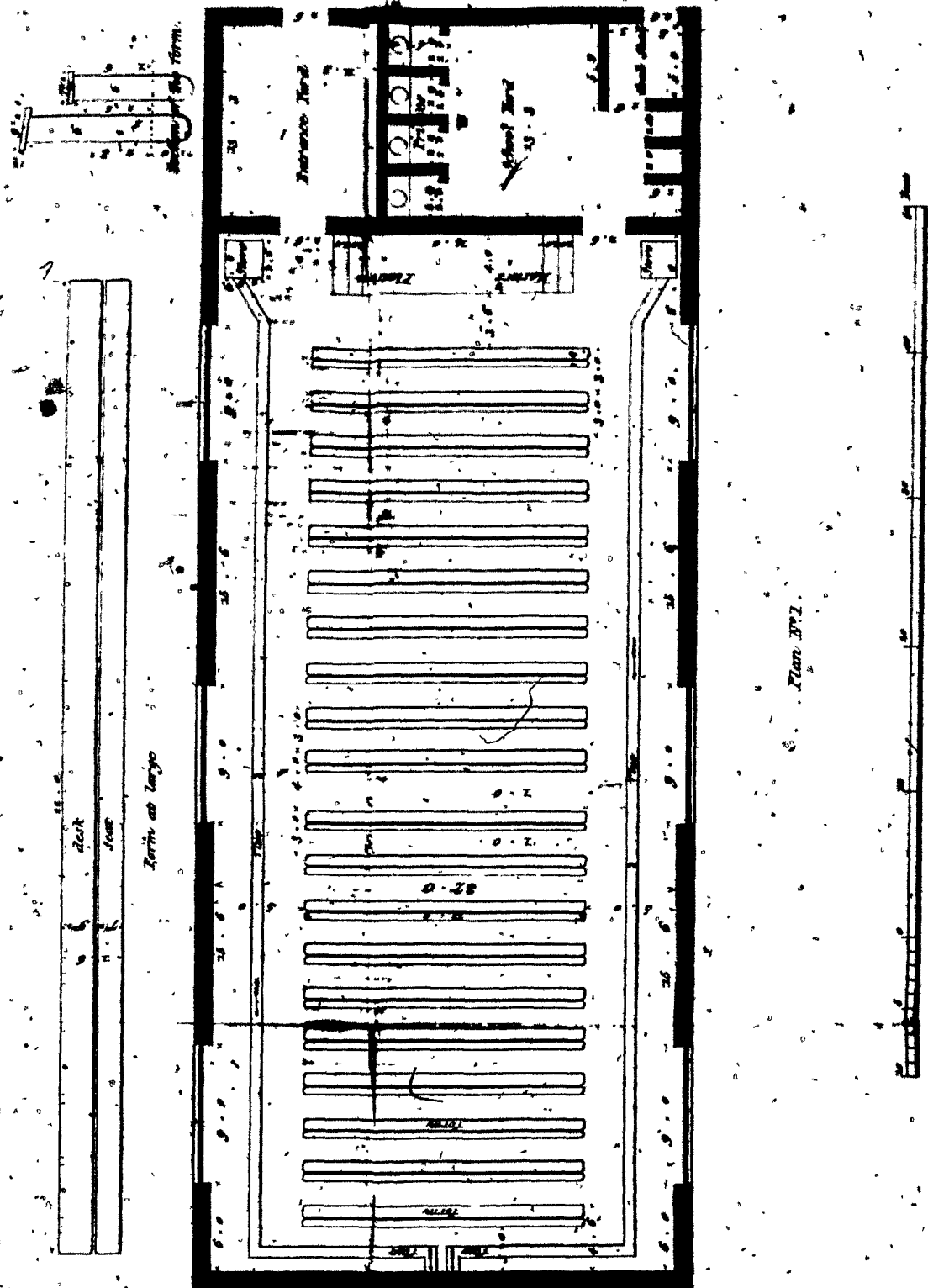


Students and monitors at the draft stations. (Source:  
 Manual... 1837)



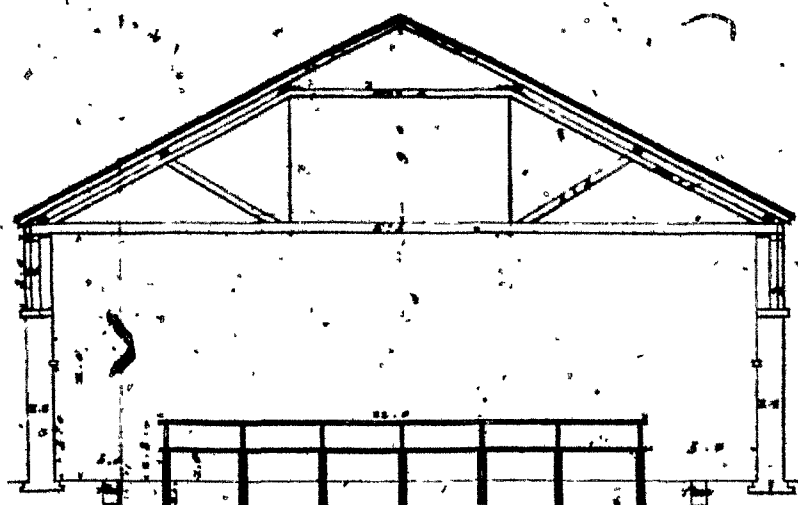


New York Lancastrian school, 1850. (Source: Réigart  
[1916] 1969)

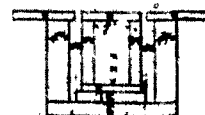


(Source: Lancaster 1809)

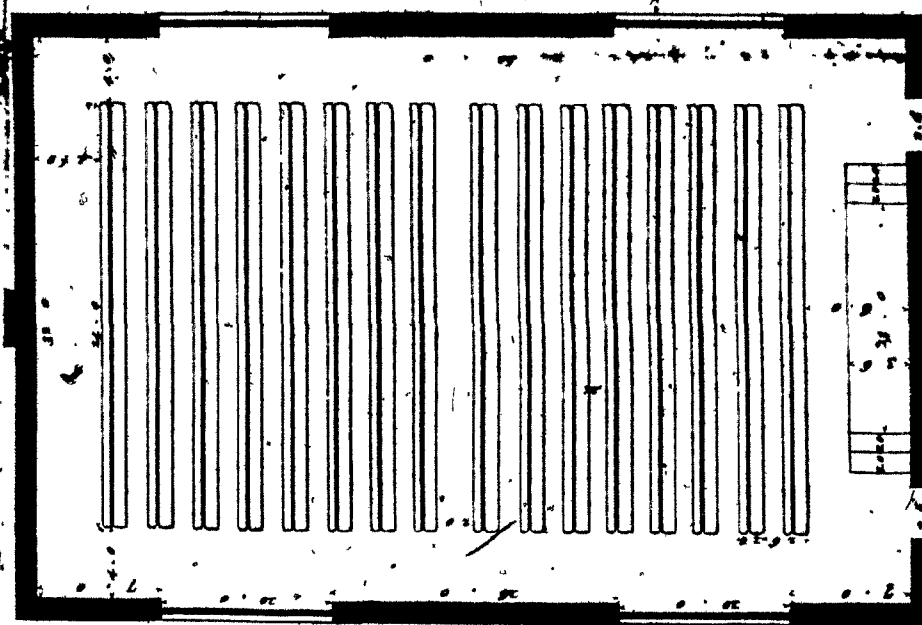
Plate II/16



Section of P.I.



Section of 2nd



Compressed Plan P.I.

(Source: Lancaster 1809)

Plate II/17\*

(Source: Pentham  
[1791] 1962).

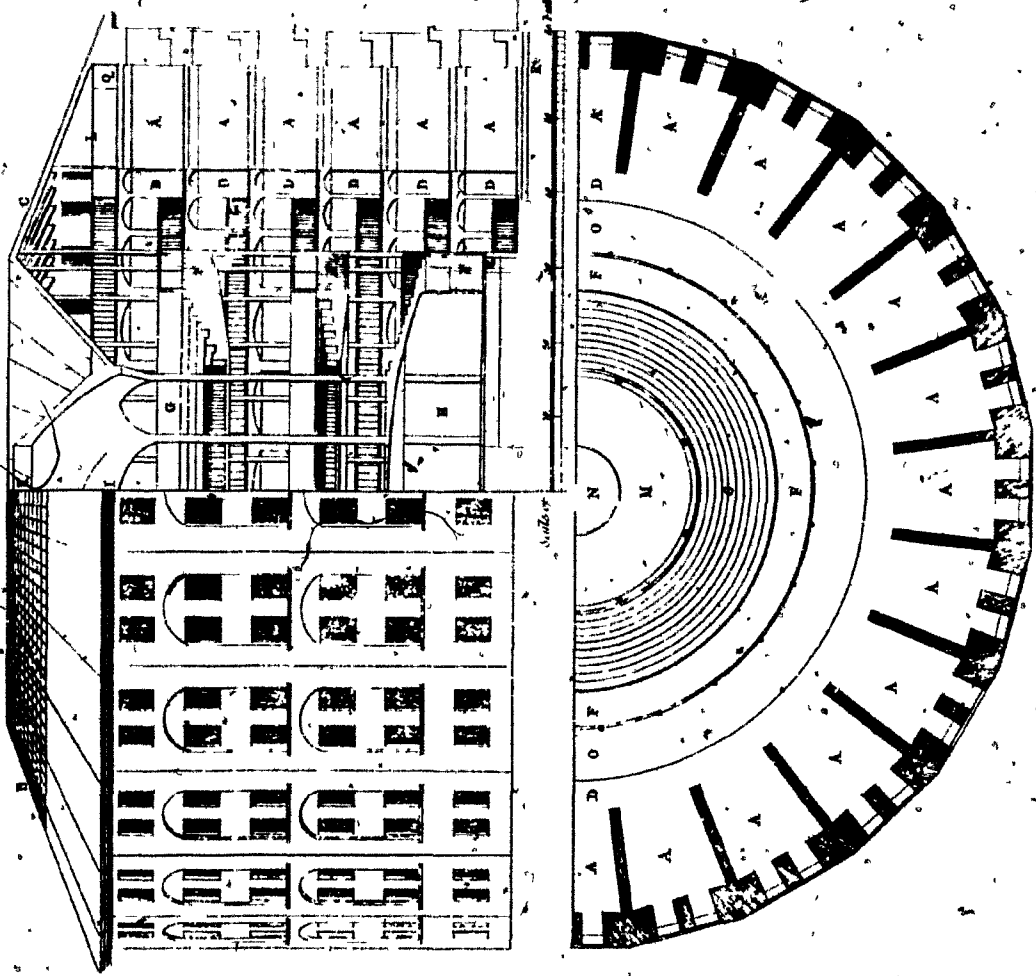
# EXPLANATION.

- A. The  
Back level of main St. Light  
D. The level of the Galleries  
E. The level of the  
F. The level of the  
G. The level of the  
H. The level of the  
I. The level of the  
J. The level of the  
K. The level of the  
L. The level of the

- M. The level of the  
N. The level of the  
O. The level of the  
P. The level of the  
Q. The level of the  
R. The level of the  
S. The level of the  
T. The level of the  
U. The level of the  
V. The level of the  
W. The level of the  
X. The level of the  
Y. The level of the  
Z. The level of the

Plate II/18

A General Idea of a PENTAGONAL PAVILION in a ... provided, but as yet (Jan 1791), Unpublished. See ...  
See Pentam's References to Plan, Elevation, & Section (being Plate referred to at p. 17).



BUILDING AND FURNITURE  
FOR AN  
 INDUSTRY-HOUSE ESTABLISHMENT,  
 FOR 2000 PERSONS, OF ALL AGES,  
ON THE  
 PANOPTICON OR, CENTRAL-INSPECTION PRINCIPLE.

[For the Explanation of the several Figures of this PLATE, see "Outline of a Work, entitled PAUPER MANAGEMENT IMPROVED;" Bentham's Works, vol. viii., p. 369 to p. 439.]

The Ranges of Bed-Stages and Cais are respectively supposed to run from End to End of the radial Walls, as exhibited in the GROUND PLAN: they are here represented as cut through by a Line parallel to the Side of the Polygon: in the Bed-Stages, what is represented as *one* in the Draught, is proposed to be in *two* in the Description.

FIG. I.—ELEVATION.

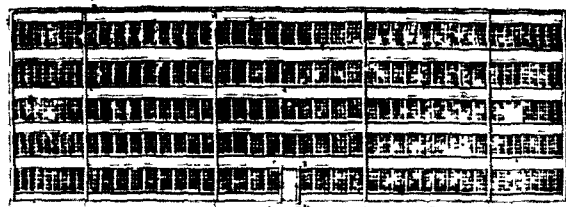


FIG. II.—SECTION.

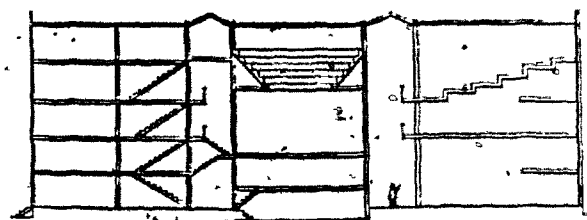
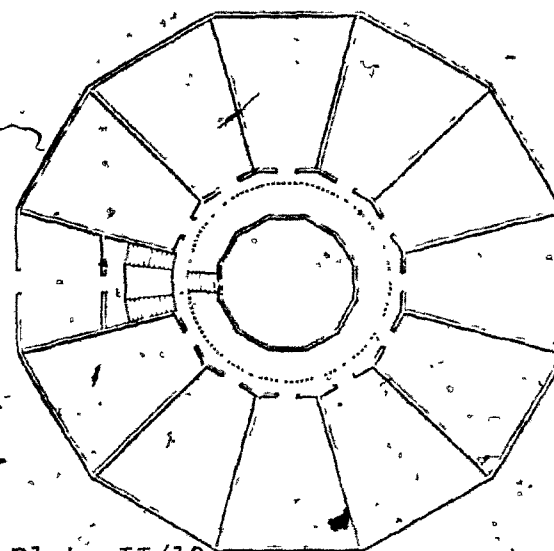
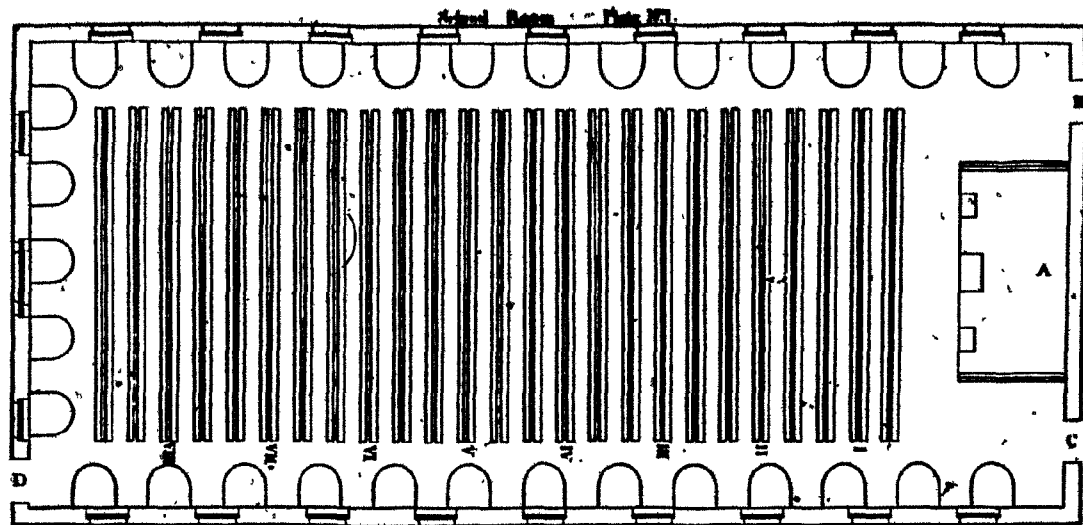


FIG. III.—GROUND PLAN.



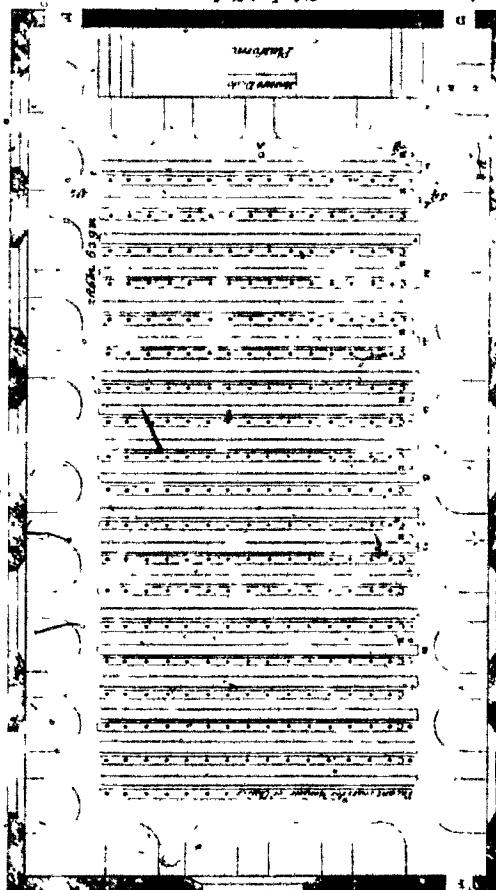
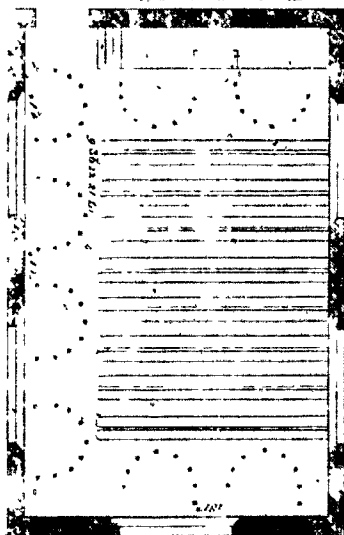
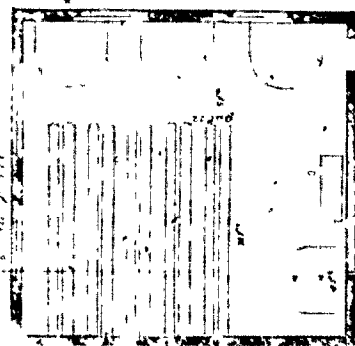
(Source: Bentham  
 [1791] 1962)



Lancastrian school room, 1820. (Source: Reigart [1916] 1969)

(Source: Manual... 1837)

Plate II/21



2. with 36 in.  $\frac{1}{2}$  inch wide  
space 3 -  
form 0 -  
space 12 -  
 $\frac{36}{12}$   
Bank at 1 slope 2.8 inches  
slope 2 -  
Bank from bank 16 -  
Bank bank to be finished to 1000 and  
the staking from pulling said 16  
seems to have the staking at the high-  
est part of the slope the first curve  
to be "nothing from the end of" the  
bank the road to the 2.8 inches apart

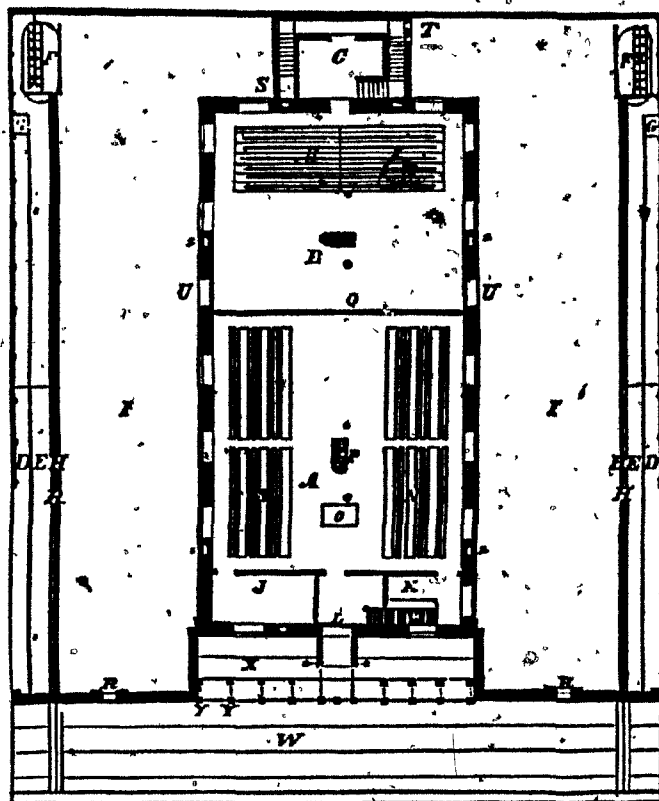
## Explanation to Plate II/22

The size of these buildings can be assessed from the fact that the New York Public School Society's No.1 and No.2 schools (built in 1809 and 1811 respectively) had school rooms of 80' x 40' and 120' x 50' for three to five hundred children. Later schools were built with elementary and grammar departments.

Each of these buildings had on a lower level story living apartments and a school room accomodating one hundred and fifty. The rooms were occupied by girls' schools, also on the Lancastrian plan, conducted by the Female Association. (Reidart [1916] 1969:24)

It might have been symbolical that infant classes were put in the basement, elementary pupils had their rooms on the ground floor and grammar departments were located on the second floor.



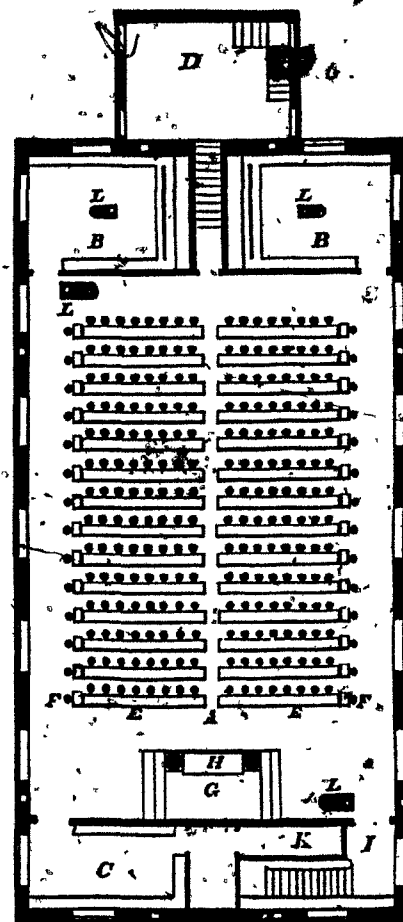


GROUND PLAN OF PRIMARY DEPARTMENT, YARDS, WOOD-HOUSES, ETC.

- A—Primary School room—39 by 38 feet.
- B—Infant School room—39 by 30 feet.
- C—Room in Stair building for brooms, brushes, pails, &c.
- J—Boys' Wardrobe,  $16\frac{1}{4}$  by 8 feet.
- K—Girls' Wardrobe,  $12\frac{1}{4}$  by 8 feet.
- M—Gallery, 32 by 11 feet—seats for 200 children.
- N, N—Desks, each  $16\frac{1}{4}$  feet long—each 12 or 13 scholars.
- O—Teacher's table.
- L—Front doorway, or main entrance.

The stations for the classes, when reading, is in the centre passage; fronting the desks.

All doors open outward.



PLAN OF GRAMMAR DEPARTMENT

(Source: Reigart [1916] 1969).

(Source:  
Manual...1839

291

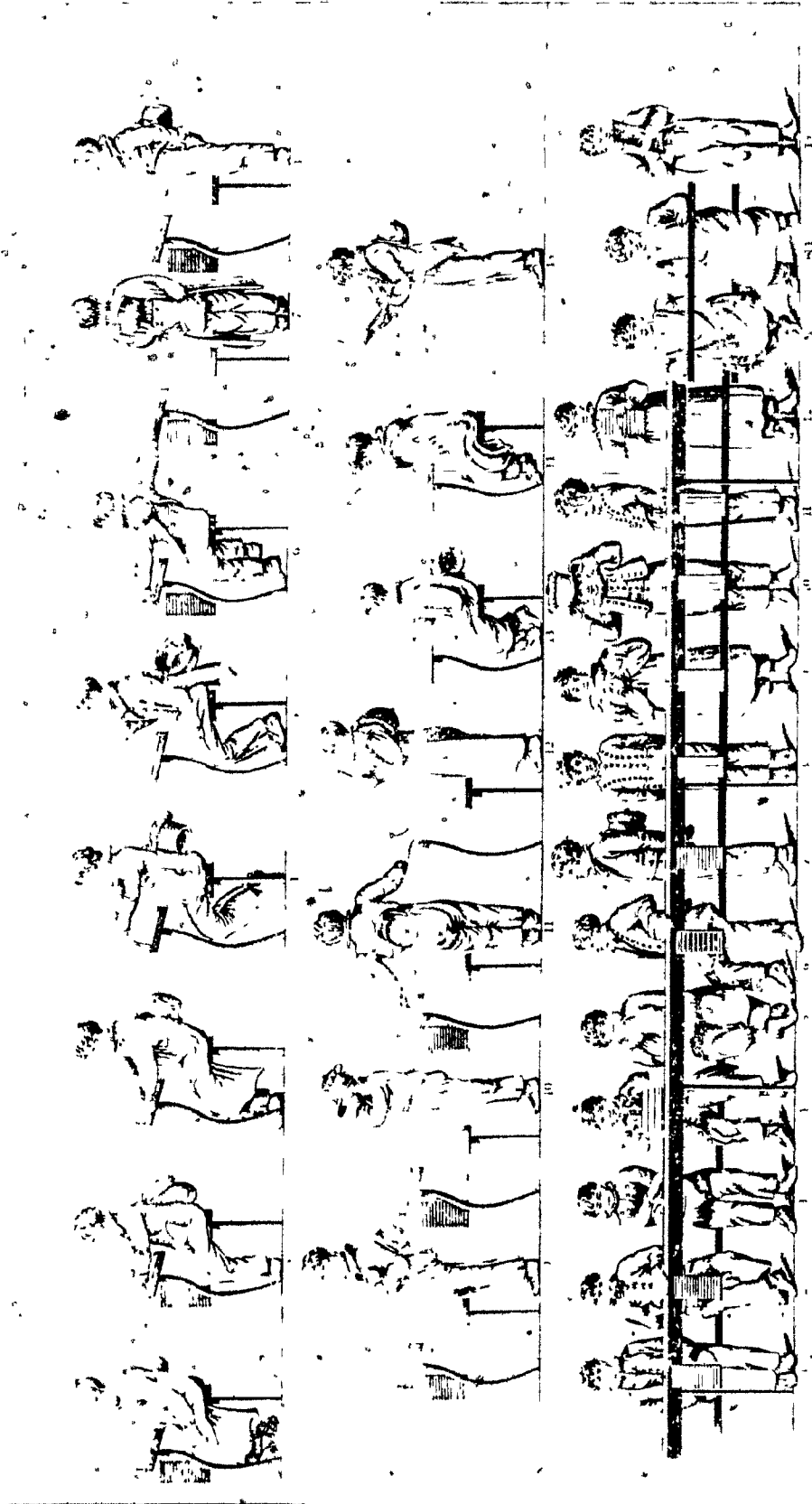
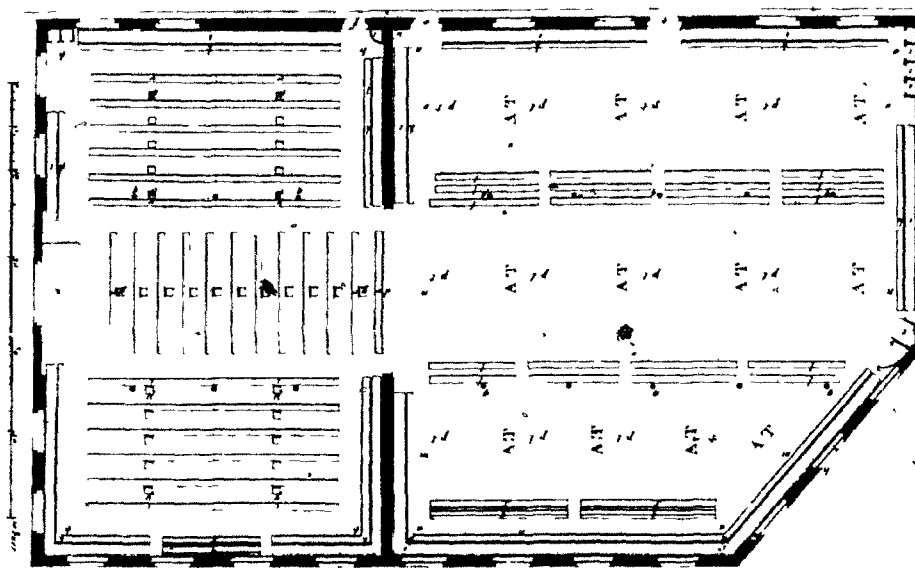
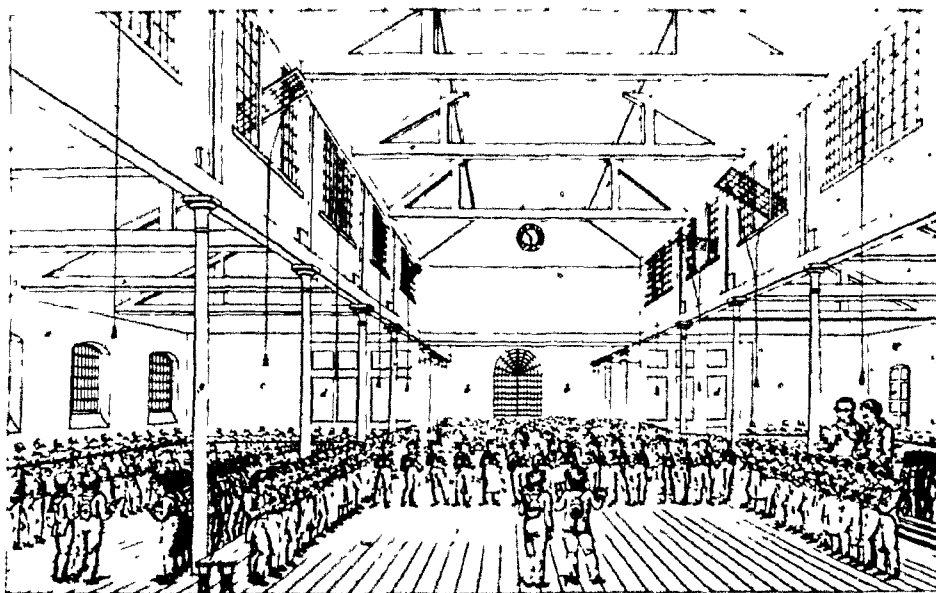


plate II/23

POSITIONS ET EXERCICES



(Source: Seaborne 1971a)

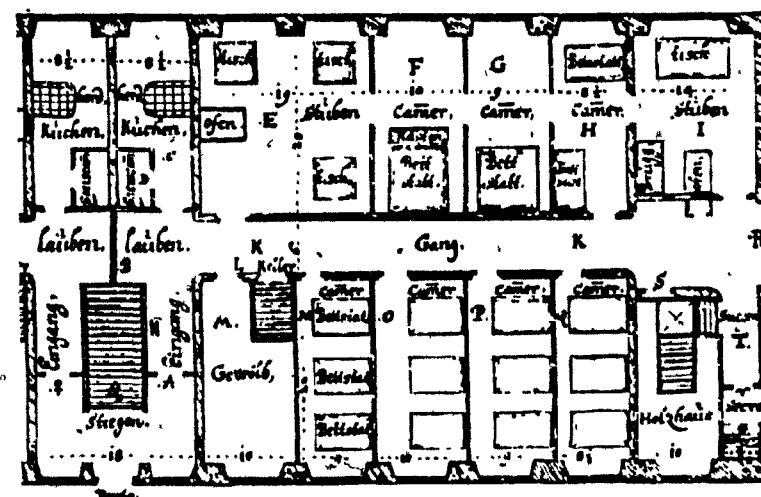
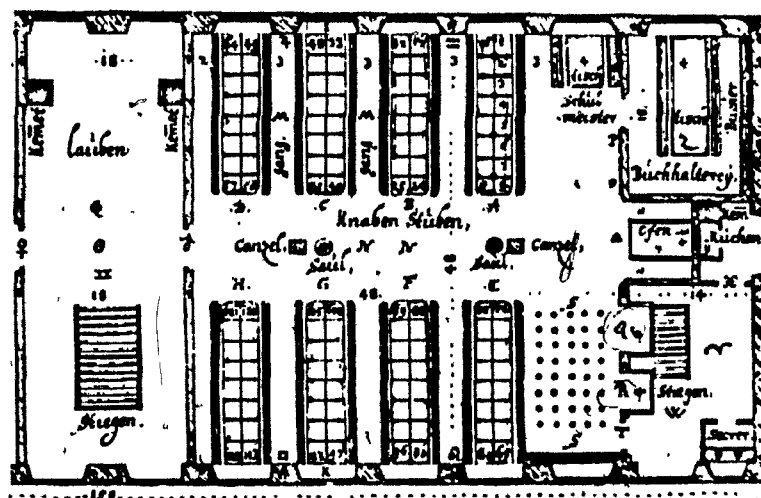
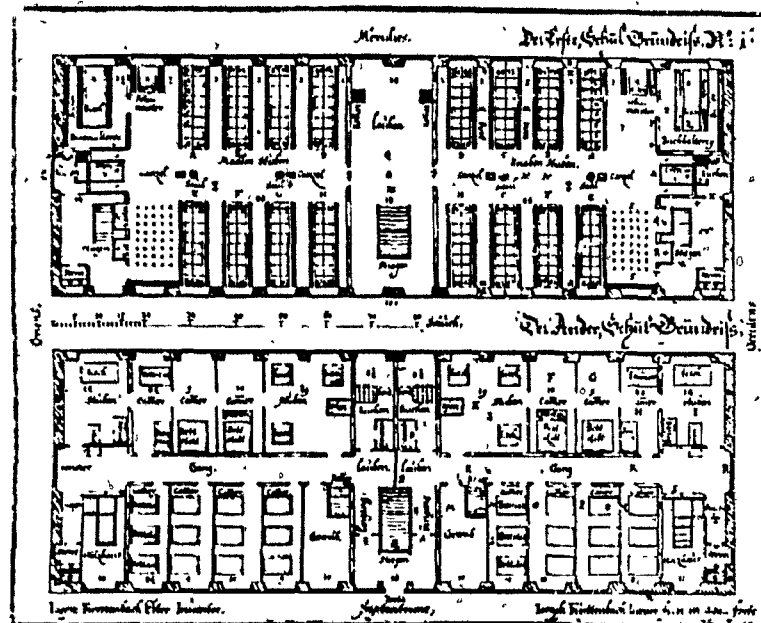
National Society's Baldwin's Gardens School. The room was divided into two unequal parts, one for 600 boys and the other for 400 girls. The letters T and A mark the site of the teachers and their assistants. (Birchenough 1925)

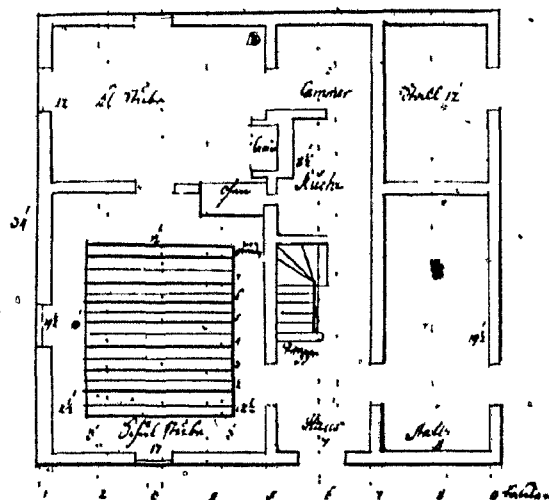
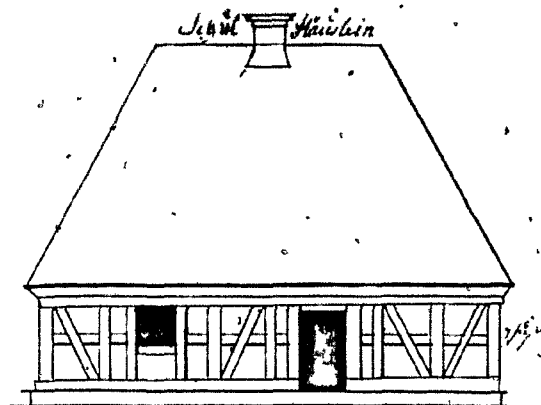
Joseph Furtttenbach's school design, 1649. (Source: Lange 1967)

Double schoolhouse for boys and girls.

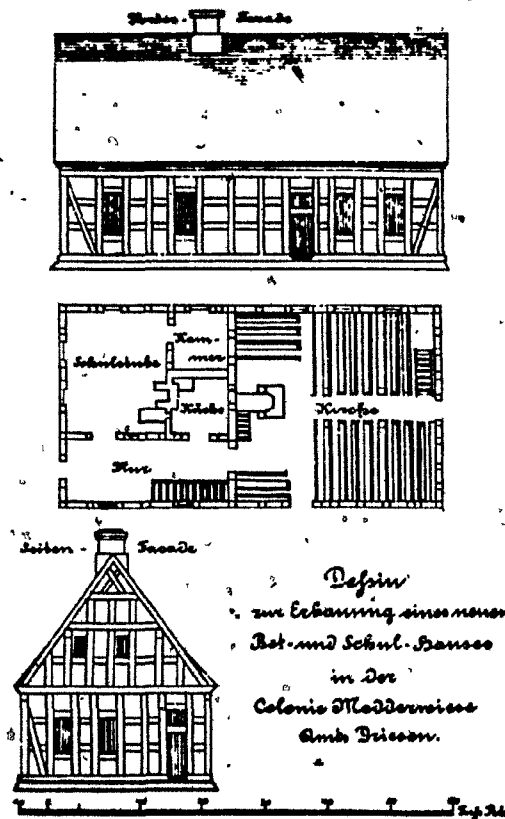
Top: Groundplan of the instructional area for 128 pupils,  
and floor plan of first floor.

Bottom: Enlargement of the right section of the groundplan.  
The seats were arranged in rows (A-H). The master's  
(Schulmeister) place was in the corner (4). There  
was a small room for studying bookkeeping (Buchhalterey)  
a kitchen (Küchen), a stove (Ofen) and the privy  
(Secret). On the second floor there were the bedrooms  
for the boarders and the master's apartment.

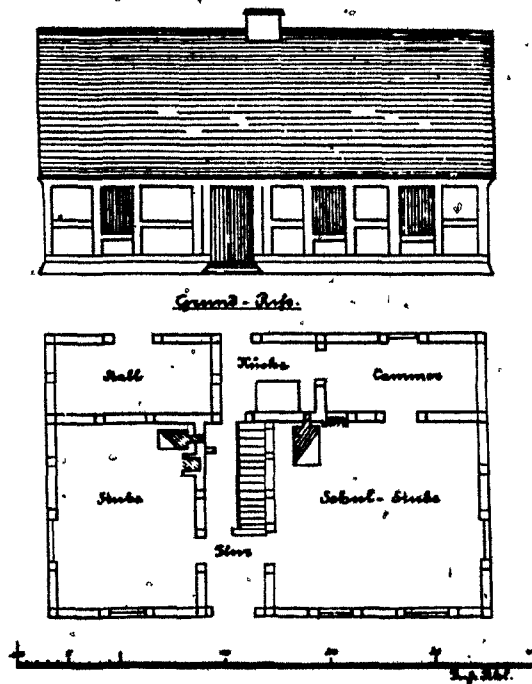




East Prussian school house, 1736-7. (Source: Lange 1967)

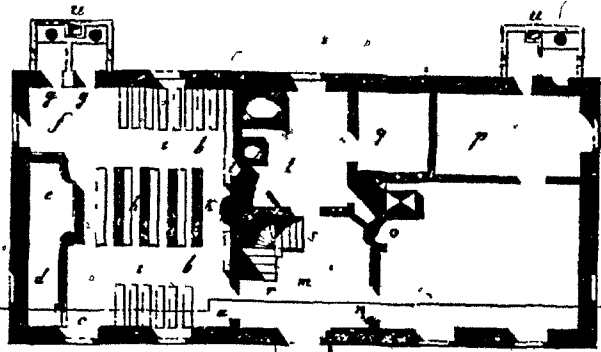
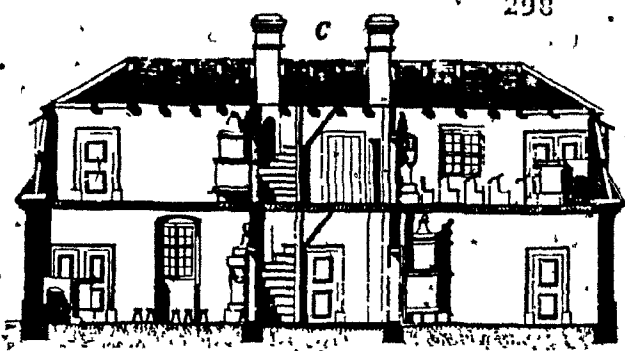
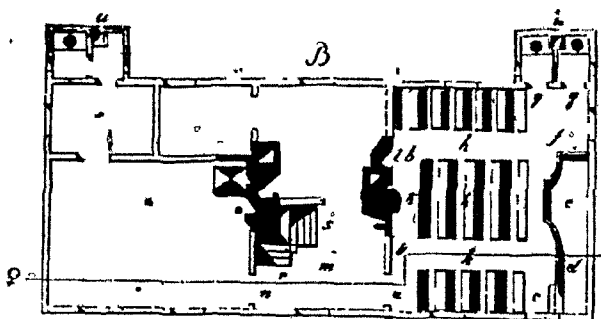


Plan of a school in Modderweise/Warthebruch, 1783.  
(Source: Lange 1967)

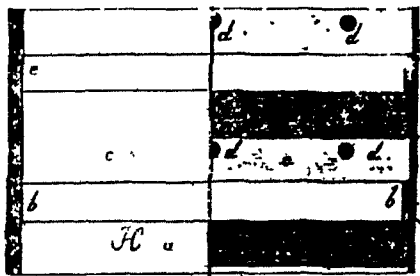
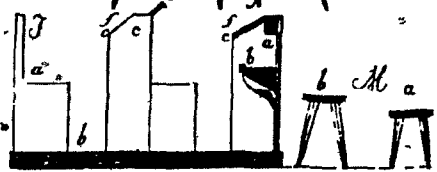
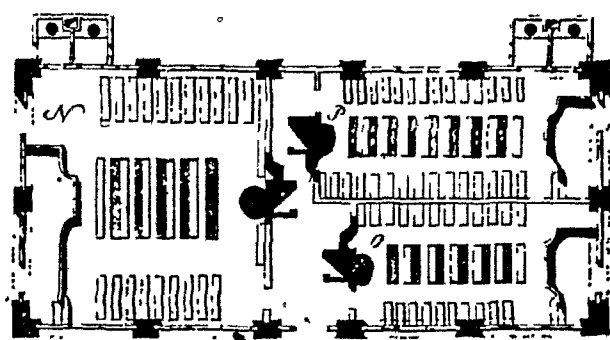
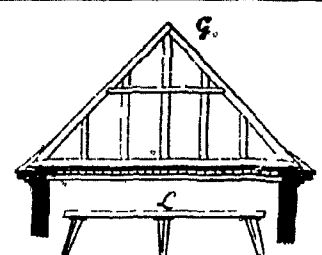


Plan of a school in Neu-Erpach/Warthebruch, 1783.  
(Source: Lange 1967)





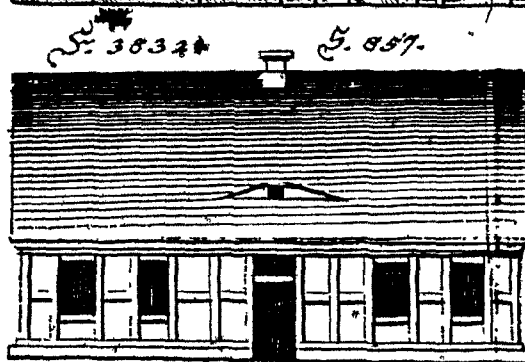
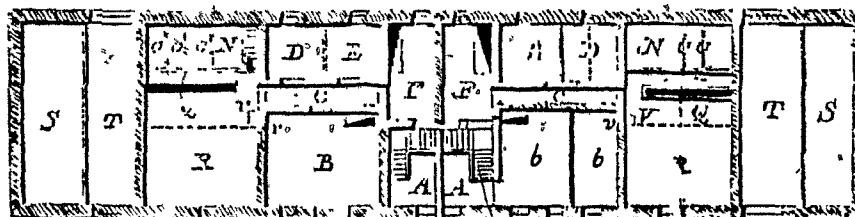
*Kloster zum Gebirge*



*Kloster*

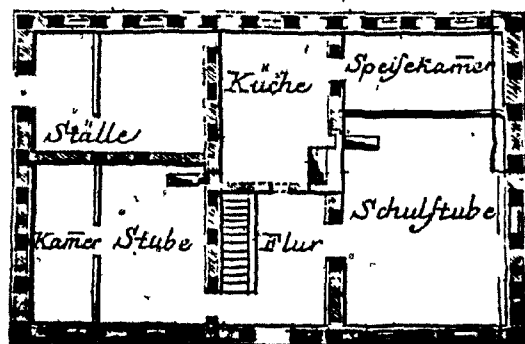
*Kloster von 7 Tis zu den Banken*

Ignaz von Felbiger's designs. (Source: Schmidt 1967)

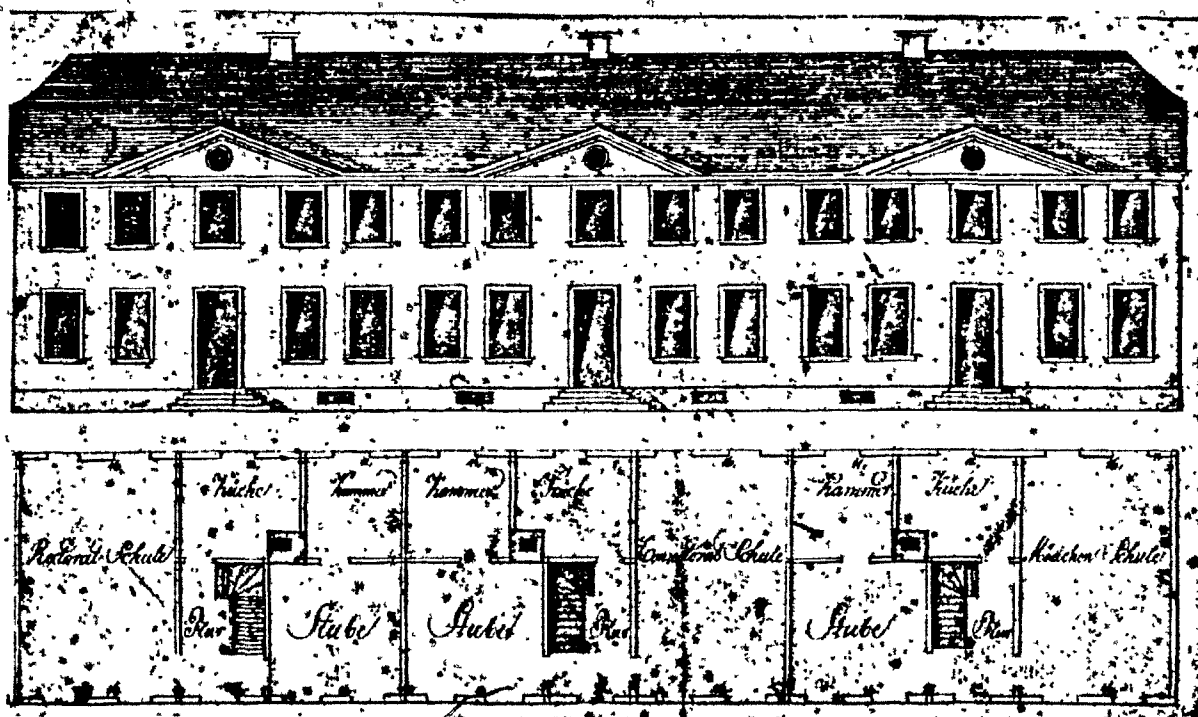


- A Hallway
- B Big schoolroom (20' x 18')
- C Corridor
- F Kitchen

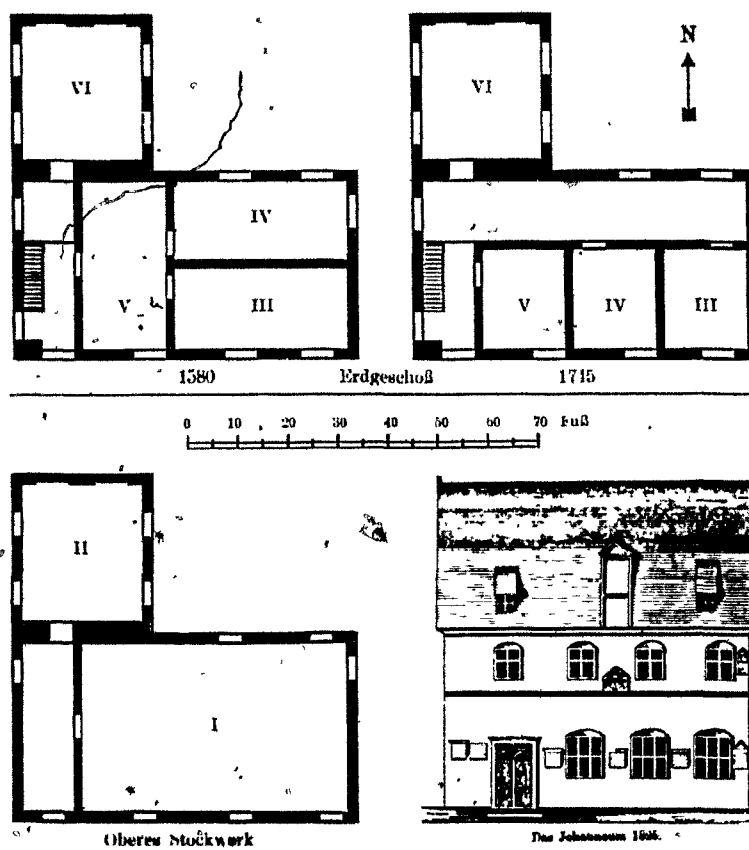
On the second floor there were the teachers' apartments.



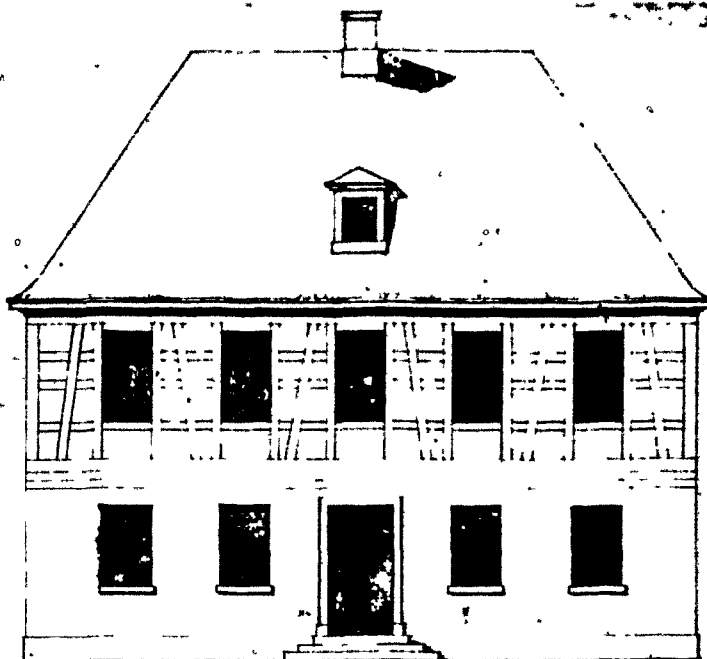
J. Ch. Fr. Keferstein's plans. (Source: Schmidt 1967).



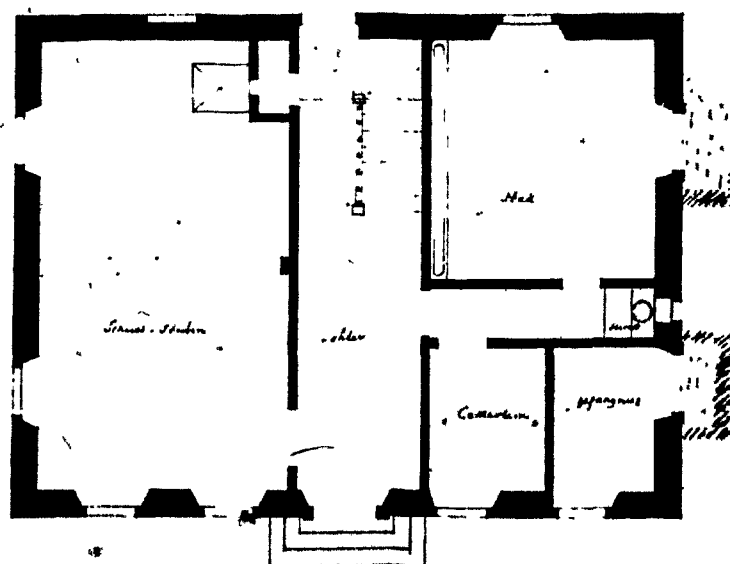
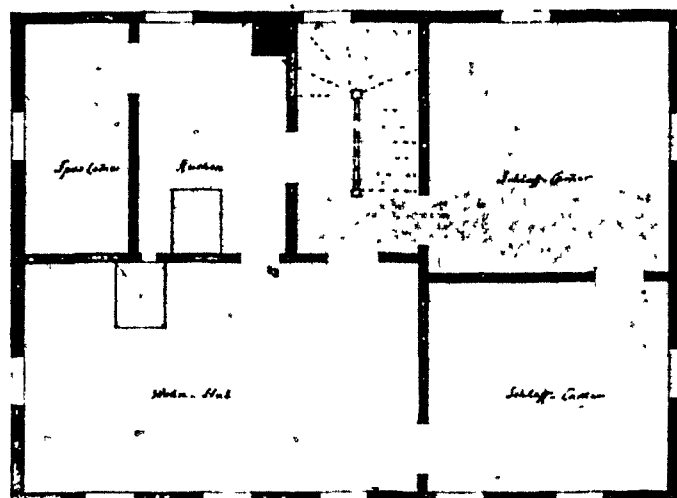
Schwelm, Bürgerschule, 1806-7. (Source: Lange 1967)

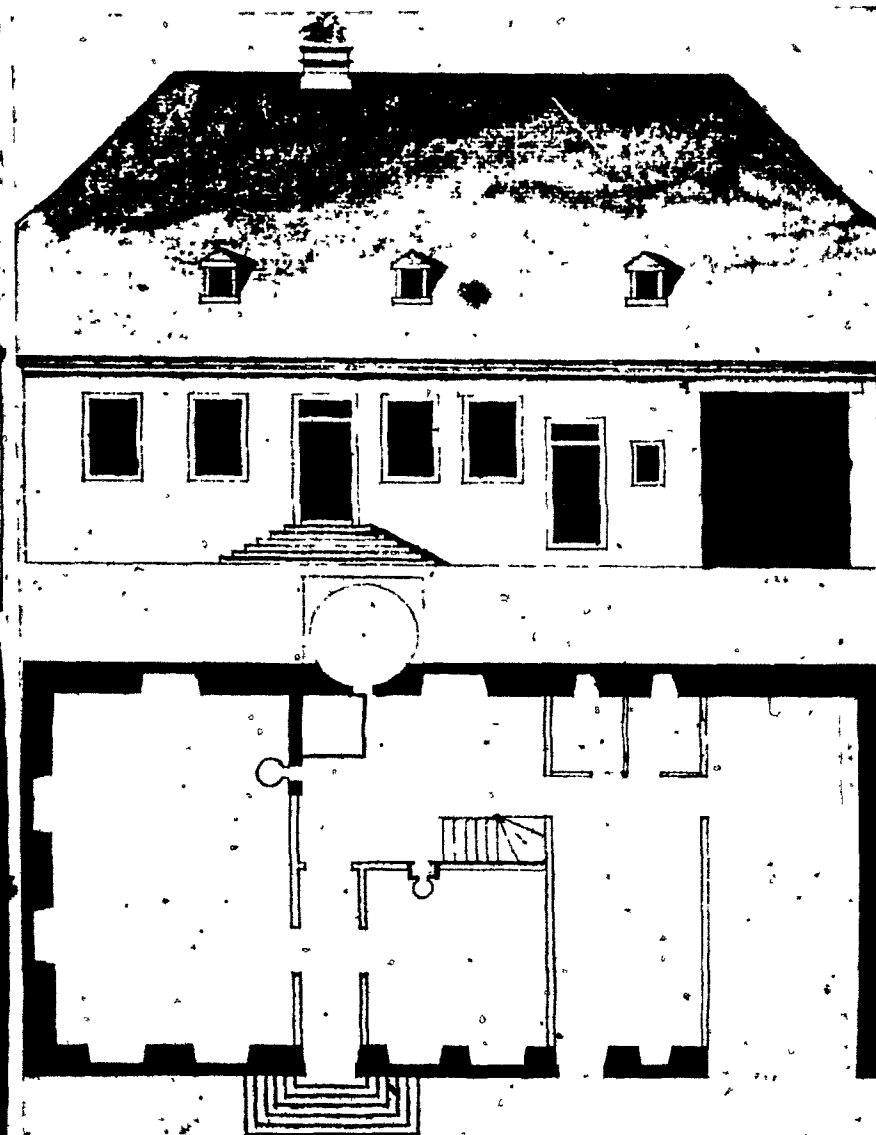
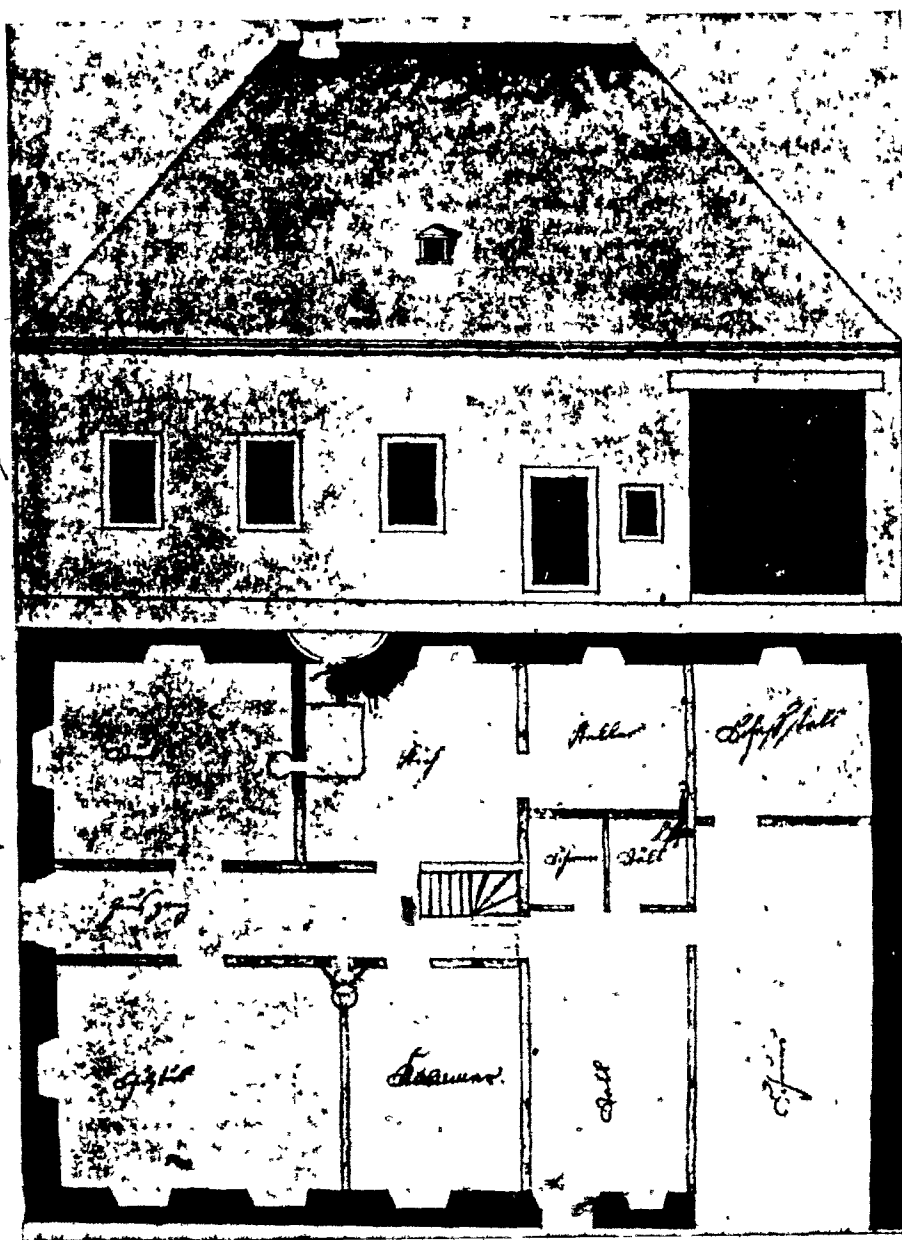


Johanneum, Lüneburg, 1582-1829. The original and the reconstructed ground floor (above) and the unaltered second floor and facade (below). The numbers indicate the classes. (Source: Lange 1967)

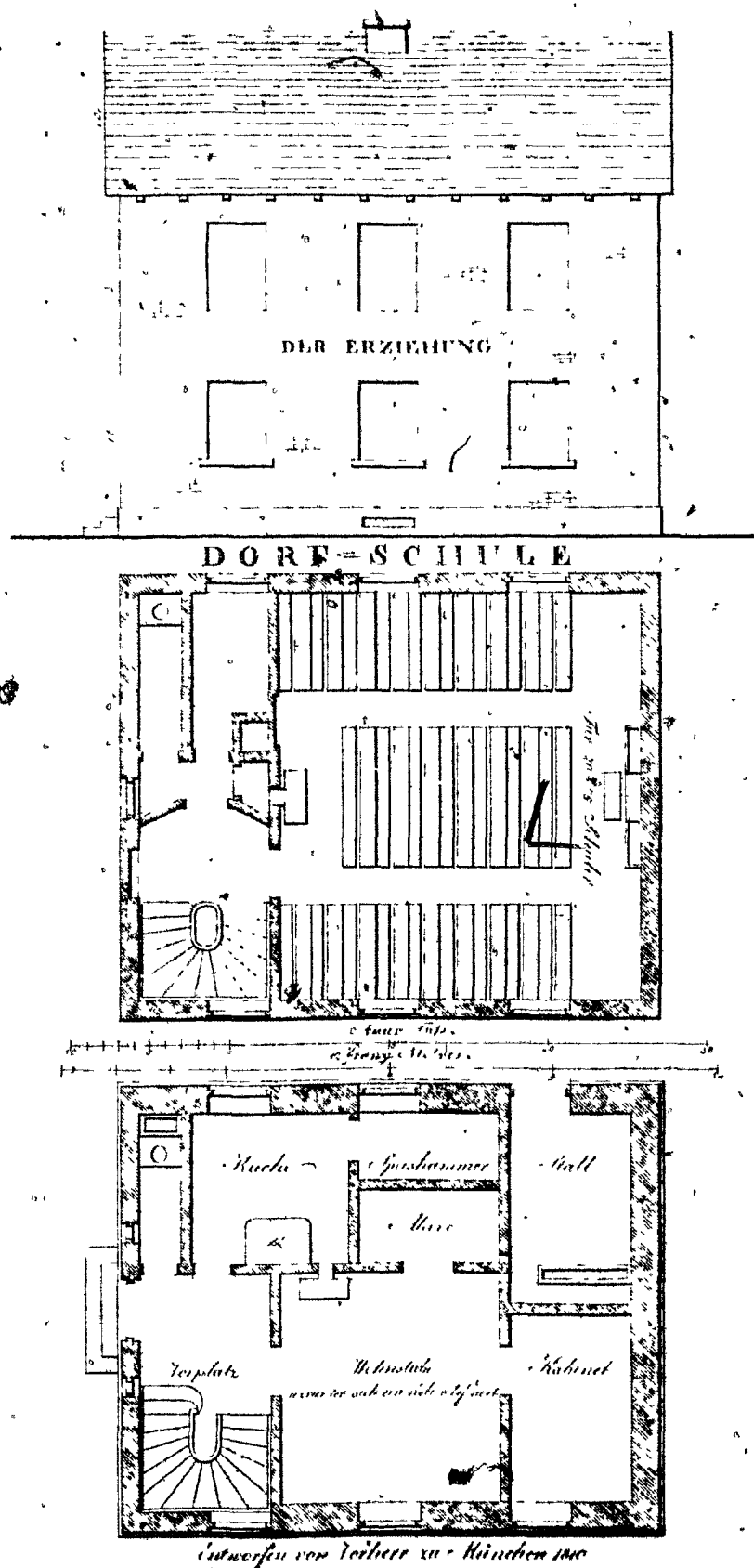


Plan of a school in  
Thalmässing.  
(Source: Schmidt 1967)



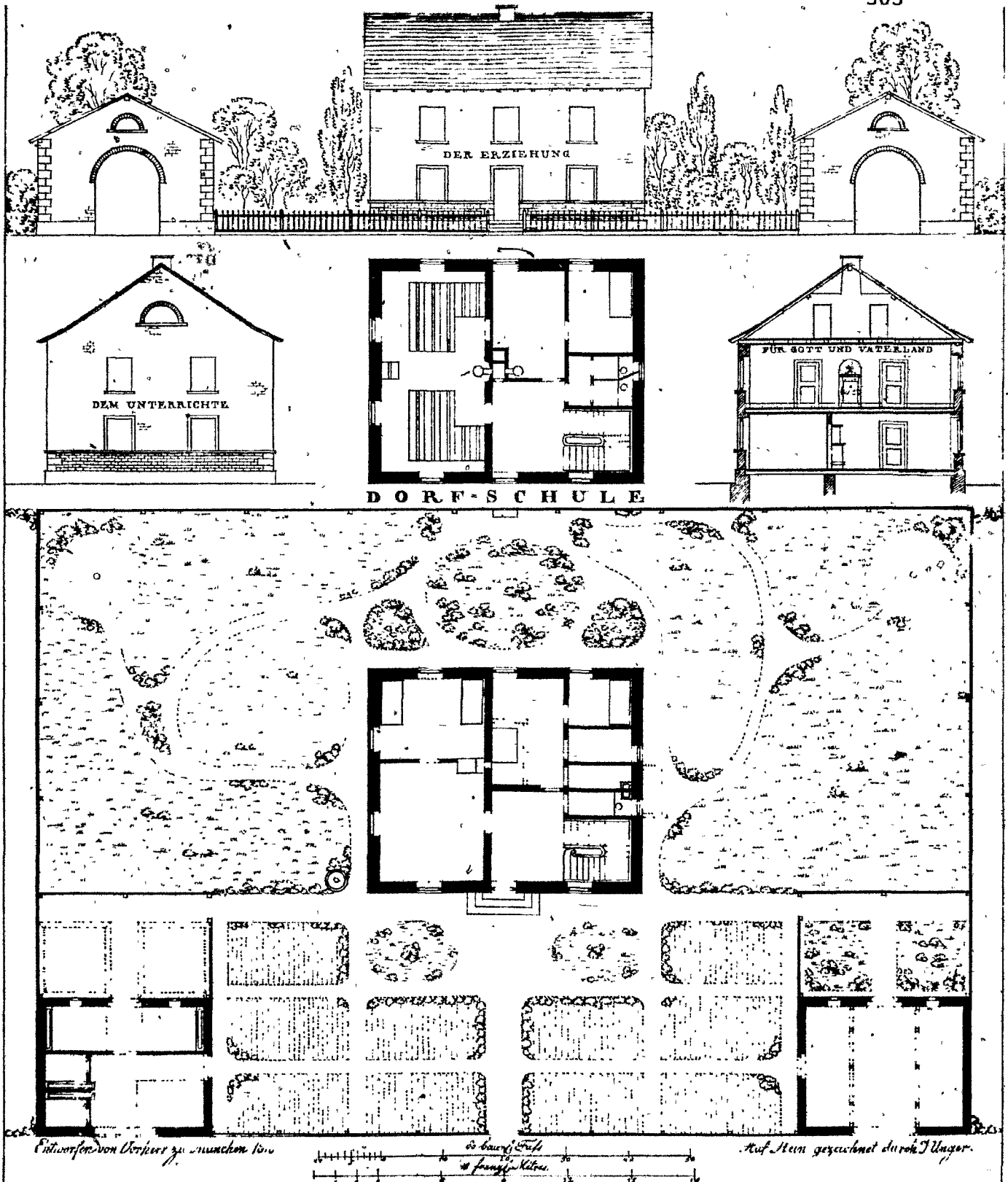


Plans of schools in Lautersweiler and Ombach. (Source: Schmidt 1967).



(Source: Vorherr 1811)

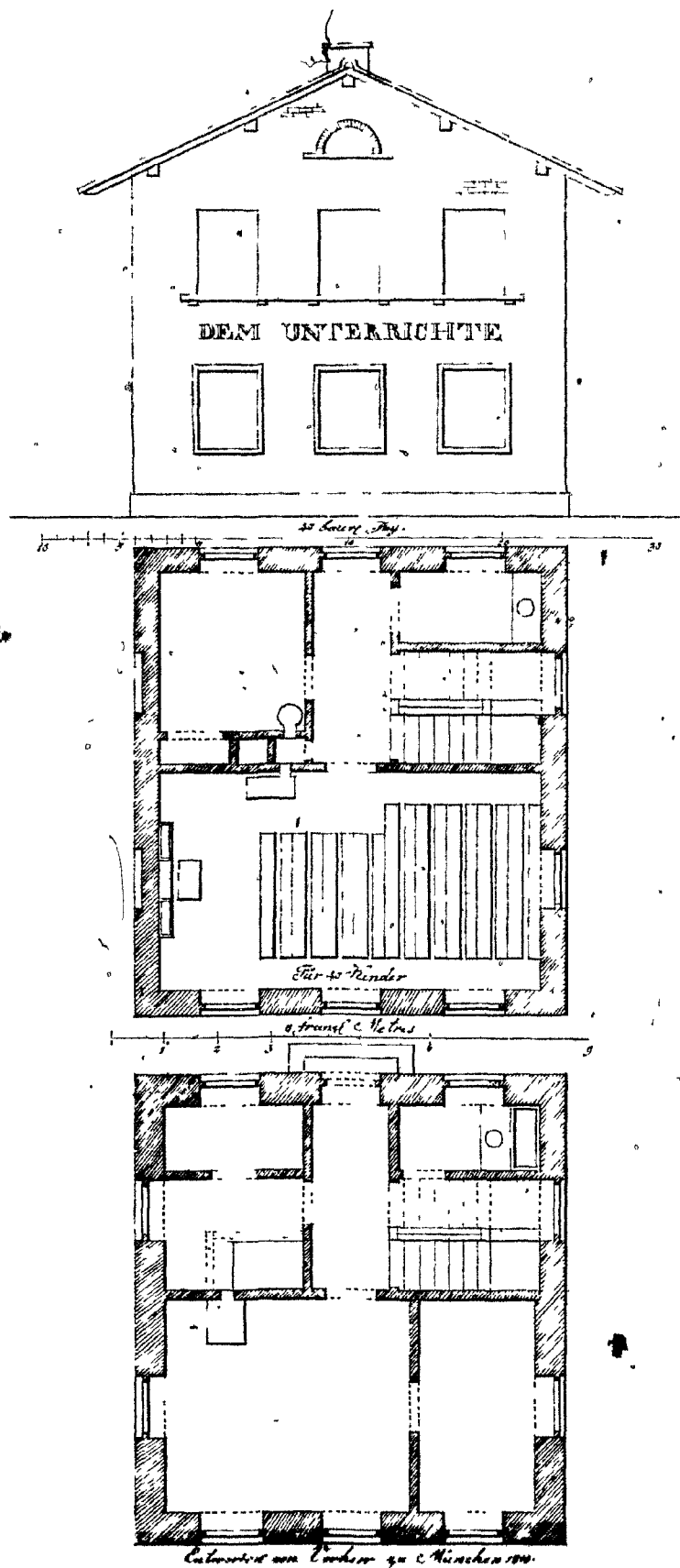
Plate III/11



(Source: Vorherr 1811)

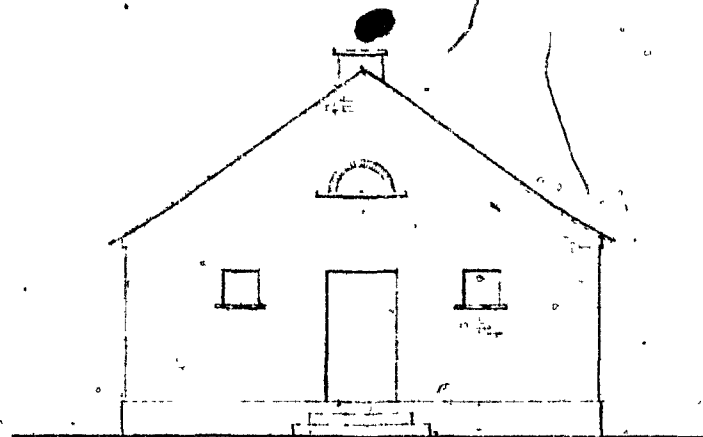
Plate III/12.



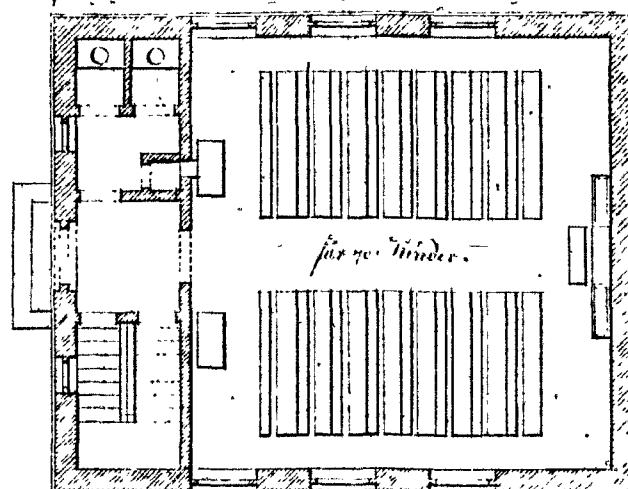
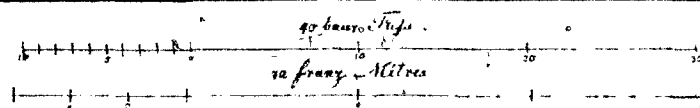
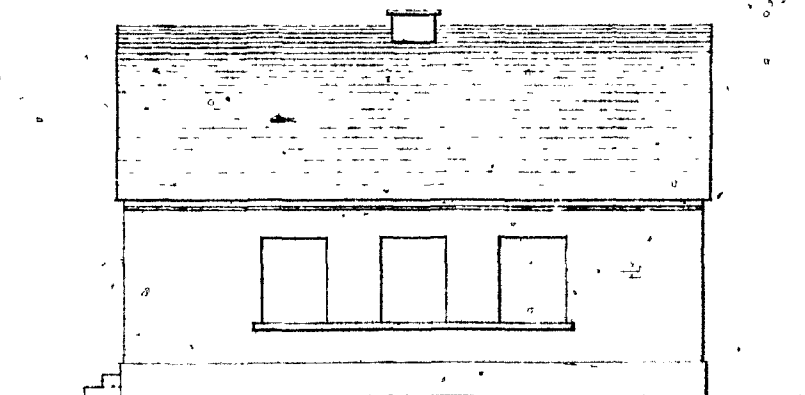


(Source: Vorherr 1811)

Plate III/13



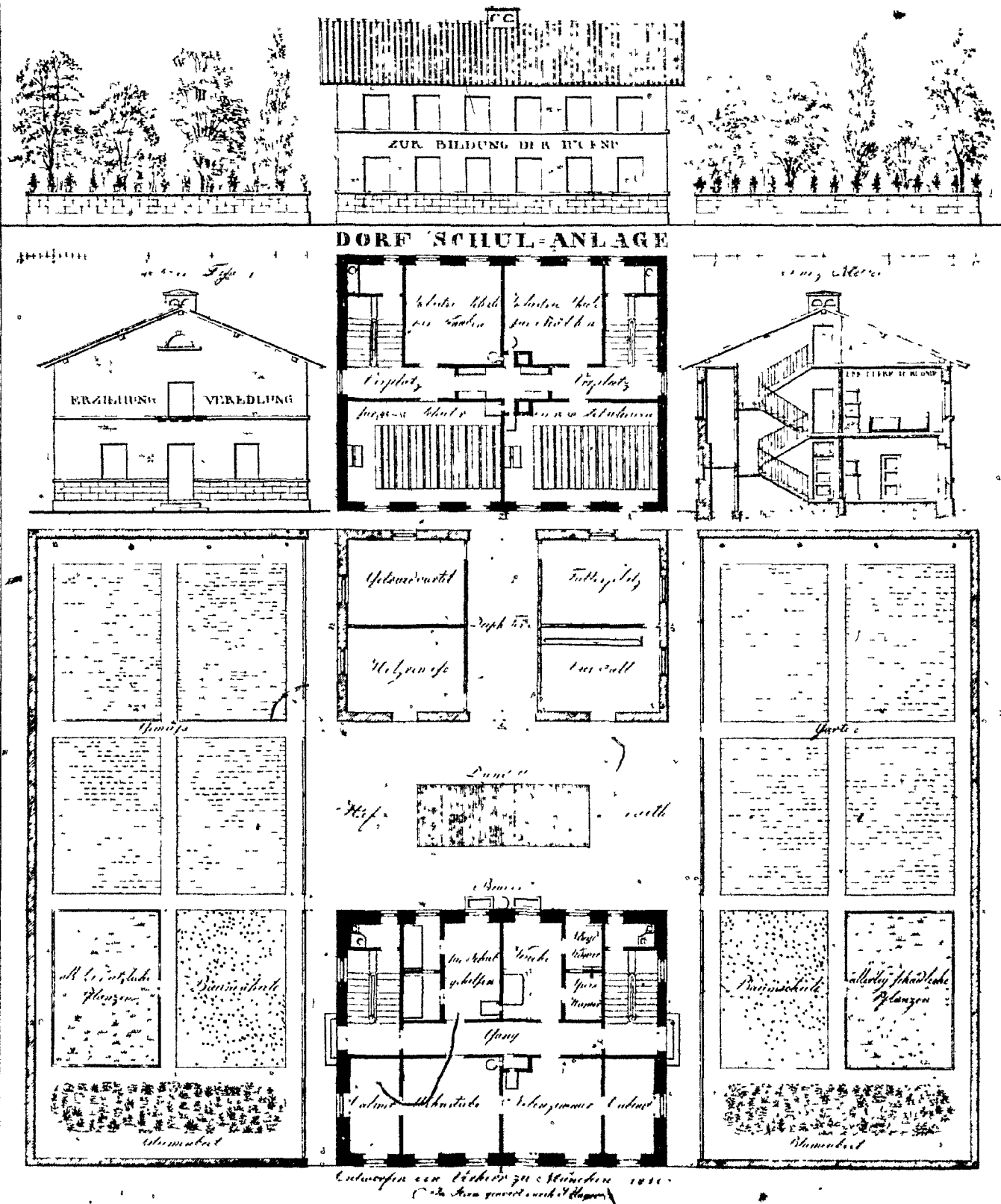
D O R F - S C H U L E



Entworfen von Vorherr zu München  
1811.

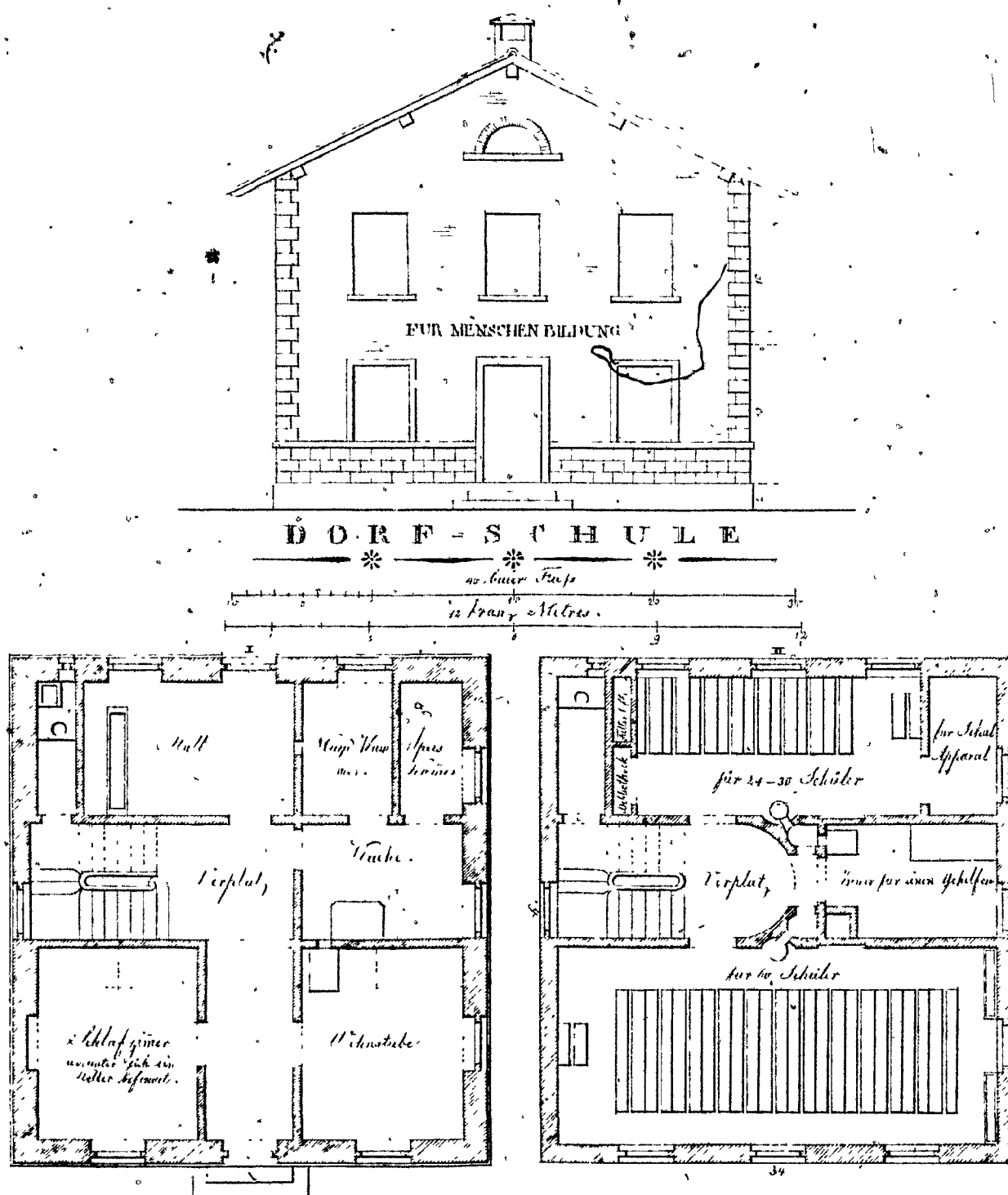
(Source: Vorherr 1811)

Platte III/14



(Source: Vorherr 1811)

Plate III/15



Entworfen von Vorherr zu München 1811

(Source: Vorherr 1811)

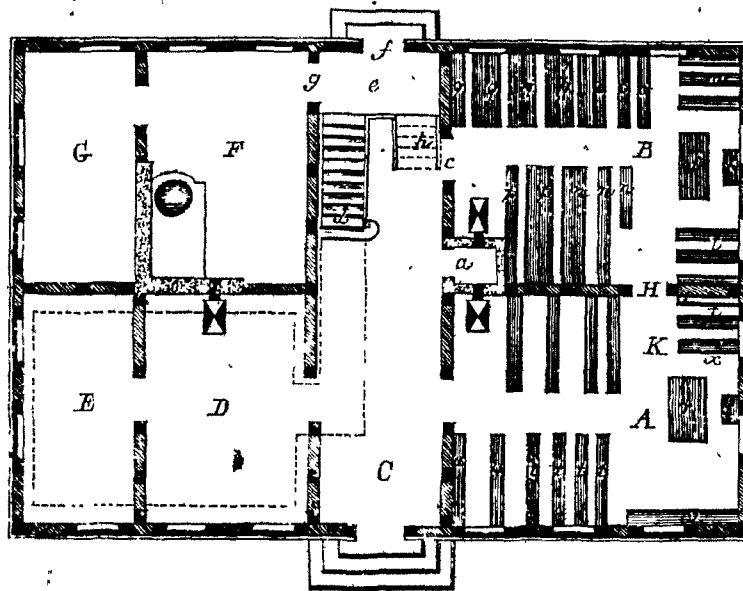
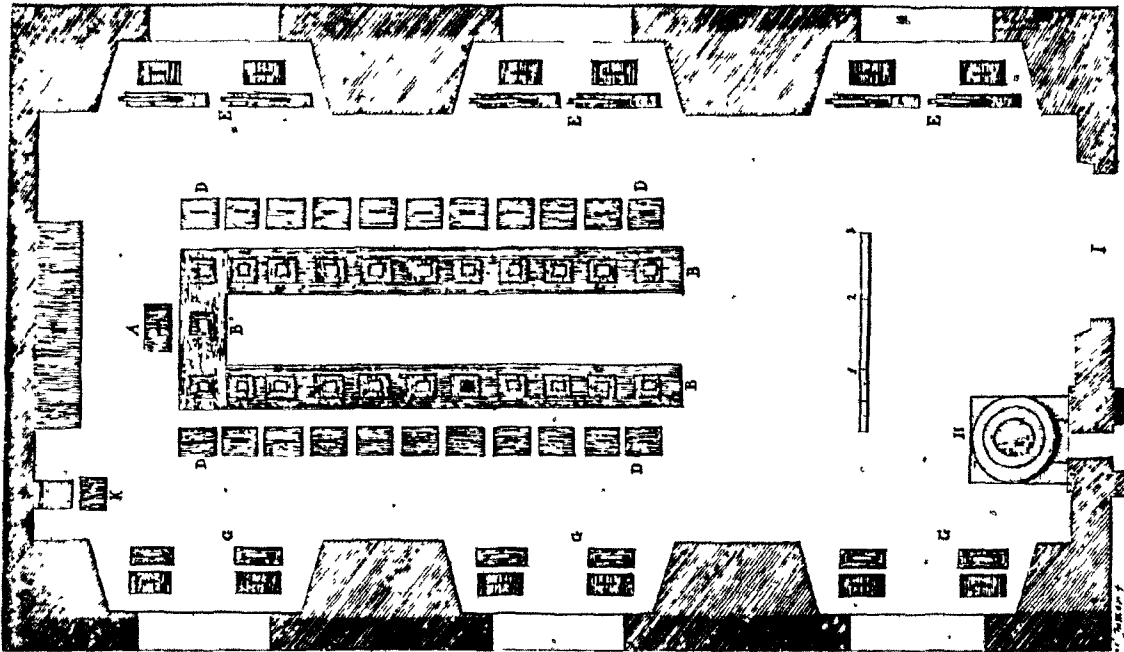
Plate III/16



Pestalozzi in his school at Stanz. (Source: Krüsi 1875)



Teacher and pupils working in a Knabenhorst. (Source: Klerm 1903)



10 20 30 40 50 Fuß.

Ground plans of industrial schools, end of eighteenth century. (Source: Lange 1967)

Explanation to Plate IV/1

(a) Design from 1826

|          |                |
|----------|----------------|
| A-a, B-b | Desks          |
| C        | Passage        |
| g        | Teacher's desk |
| i        | Stove          |
| k        | Chimney        |

(b) Design from 1835

|         |                                  |
|---------|----------------------------------|
| a       | Entrance                         |
| b, c, m | Hallways                         |
| e       | Teacher's seat                   |
| f       | Passage                          |
| g       | Desks                            |
| h       | Place of blackboards, maps, etc. |
| k       | Stove                            |
| l       | Chimney                          |
| n, o    | Privies                          |

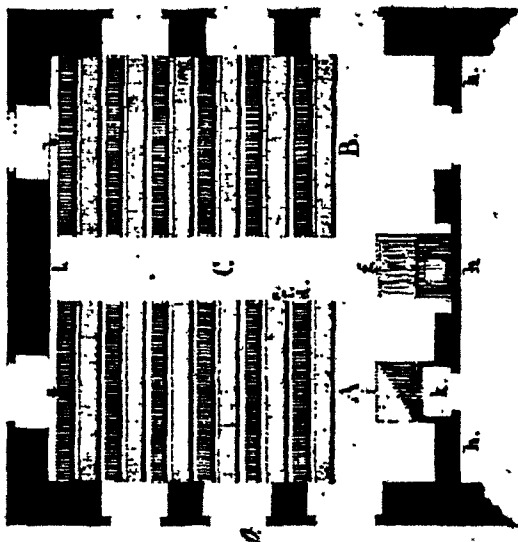
(c) Design from 1806-9

|         |                 |
|---------|-----------------|
| A       | Kitchen         |
| B       | Room            |
| a, b, c | Doors           |
| d       | Stove           |
| e       | Teacher's place |
| f       | Book case       |
| h       | Blackboard      |

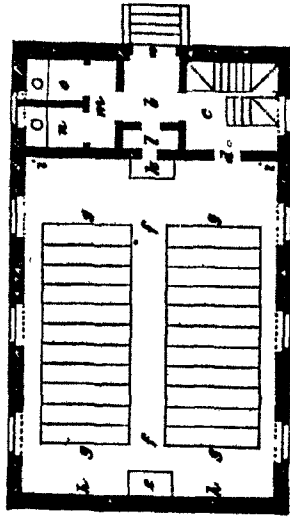
(d) Design from 1895

(Source: Schmidt 1967)

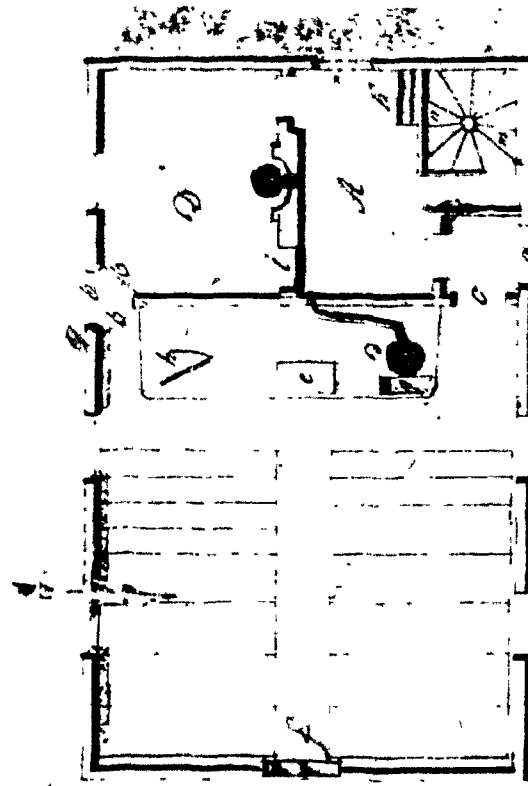




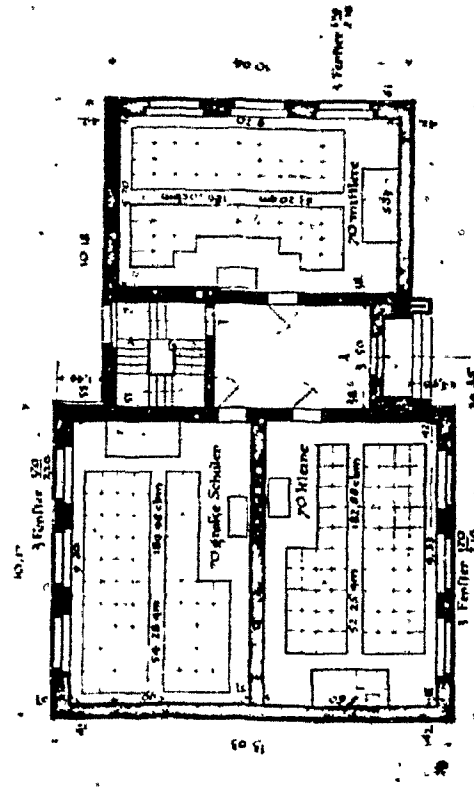
(a)



(b)

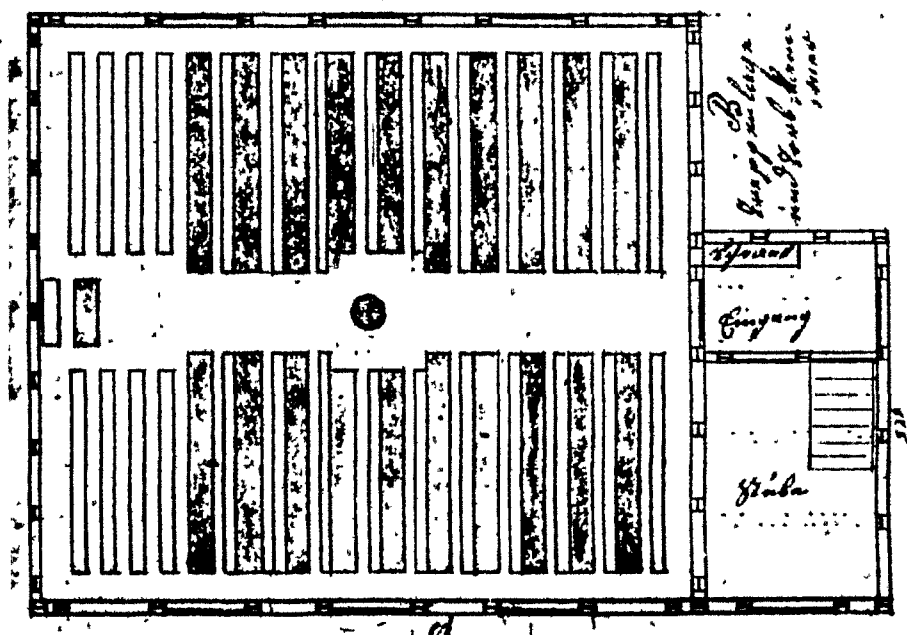


(c)



Endgeholz

(d)



Groundplan of school, Hitzhausen, 1827.



Düsseldorfer Normalpläne, 1806-9.

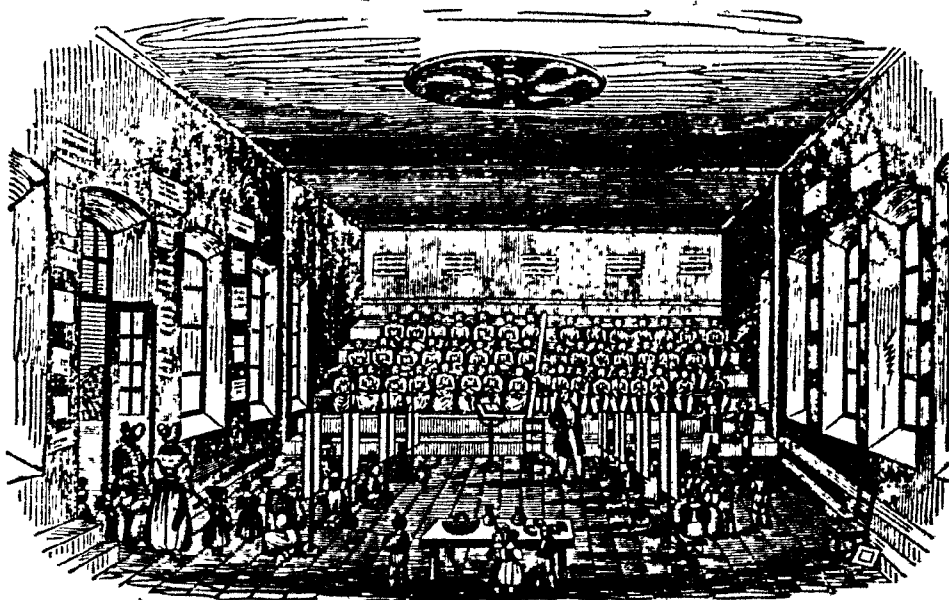
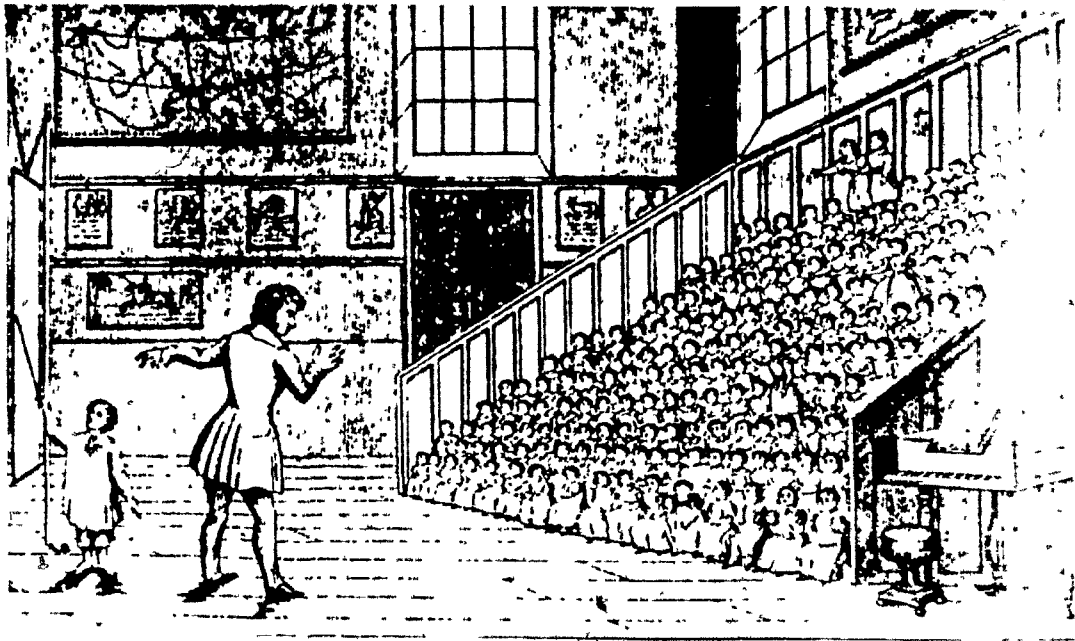
(Source: Schmidt 1967)

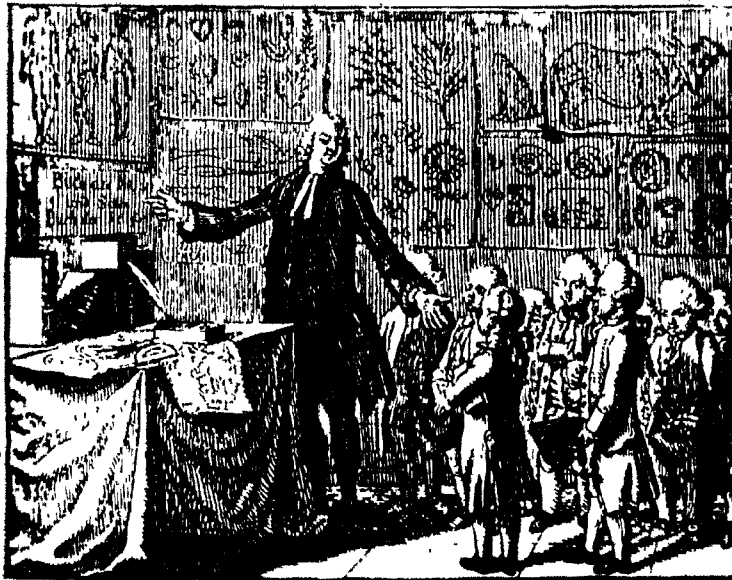
Explanation to Plate IV/3

Top: Wilderspin's Infants' school at work. (Source:  
(Burchell 1980)

Middle: Stow's model infants' school, 1836. (Source:  
Seaborne 1971a)

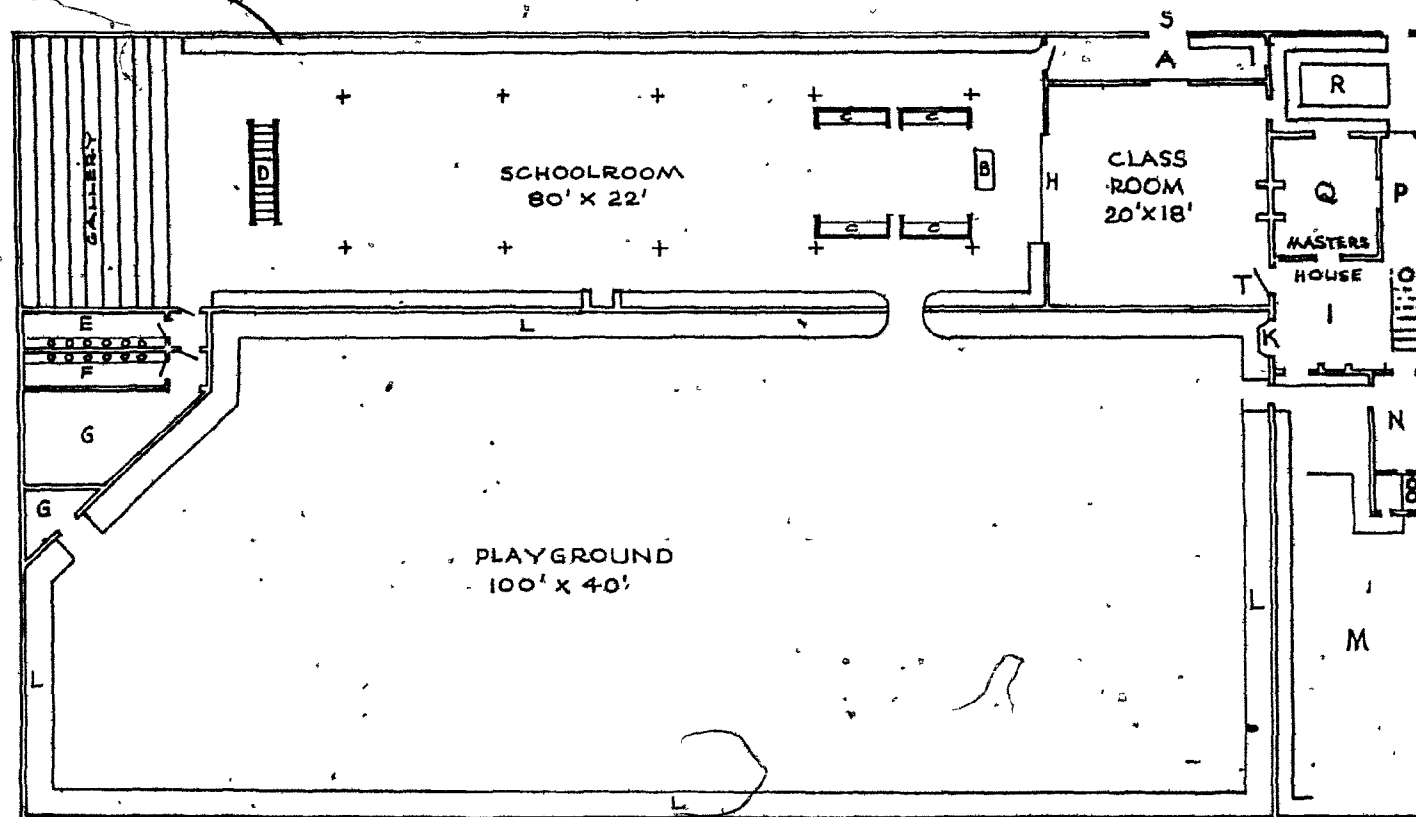
Bottom: Monitorial system combined with gallery.  
(Source; Good 1960)



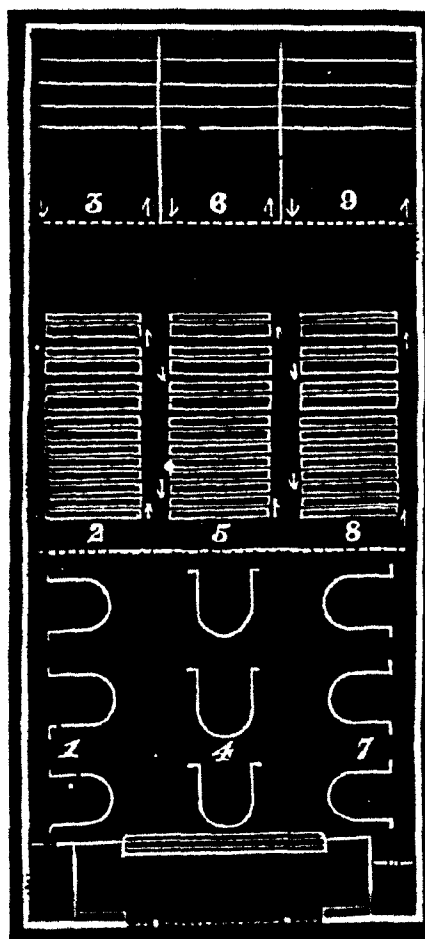


Visual education according to Basedow. (Source: Good 1960)

- Plan of a Wilderspin  
 1. infant school  
 lobby  
 B master's desk  
 C seats for visitors  
 L rostrum for the monitor  
 I boys water closets  
 K girls water closets  
 lumber places  
 folding doors  
 kitchen  
 window looking into the  
 playground  
 flower garden round the  
 playground  
 master's garden  
 wash house  
 stairs to the upper rooms  
 passage  
 parlour  
 front garden  
 S front door  
 T glass door  
 + lesson posts



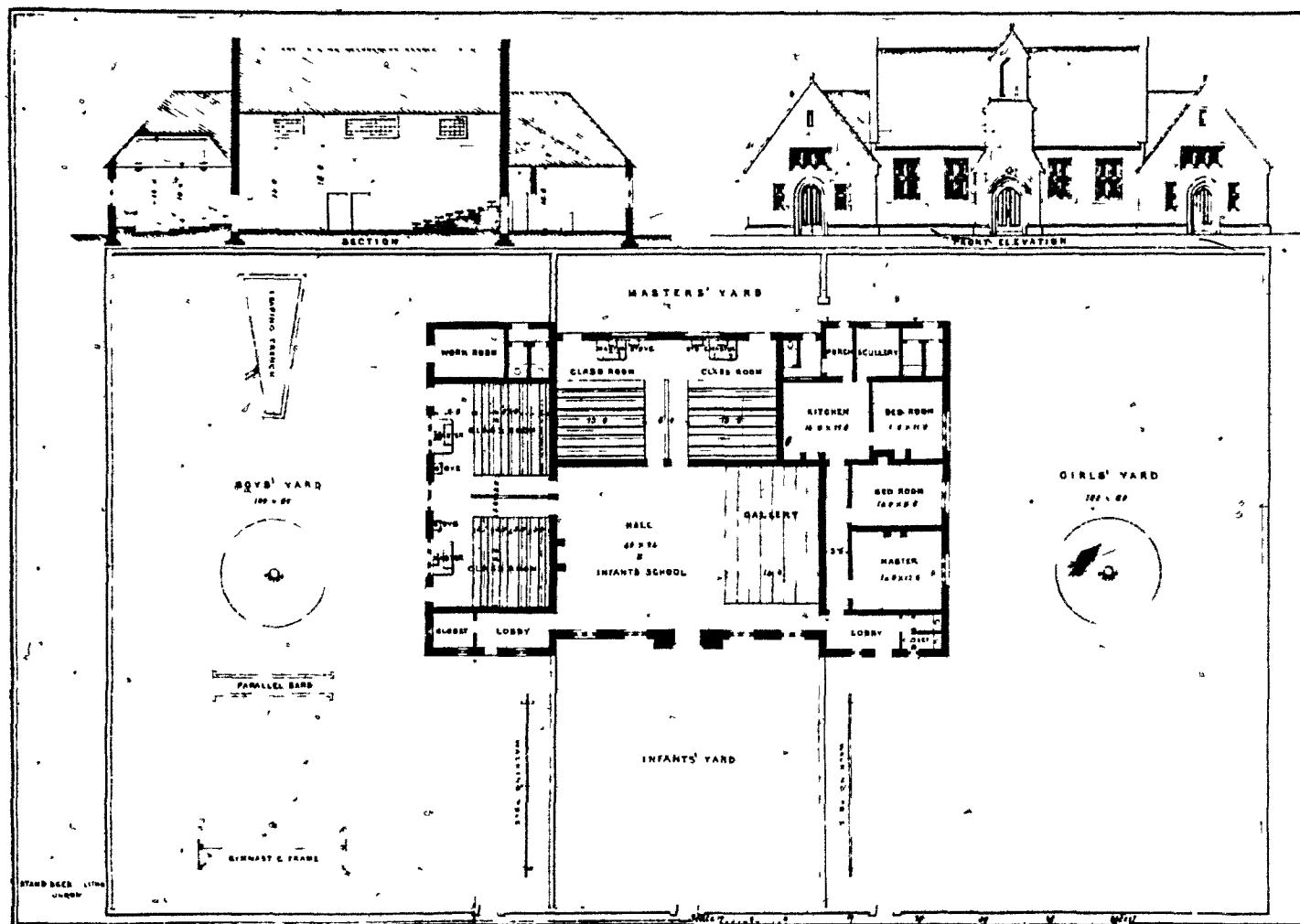
Plan of a Wilderspin infants' school. Master and his wife lived in an attached two storey house. "Its kitchen communicated directly with the classroom and a window looked out on the playground so that he could watch the children during the luncheon recess." (Burchell 1980:7) (Source: Burchell 1980)



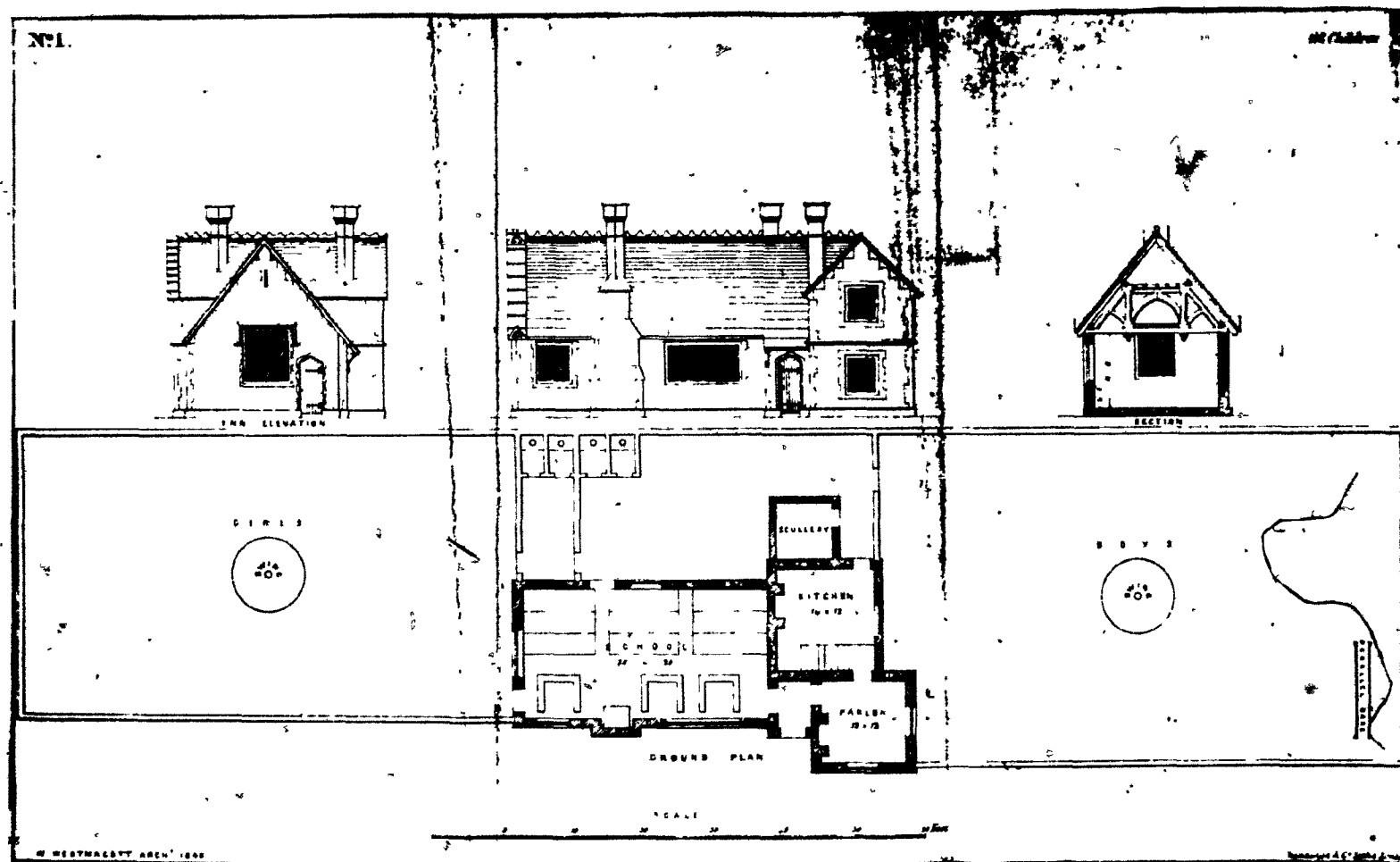
The Borough Road School, arranged on the tripartite system, 1856. (Source: Birchenough 1925)



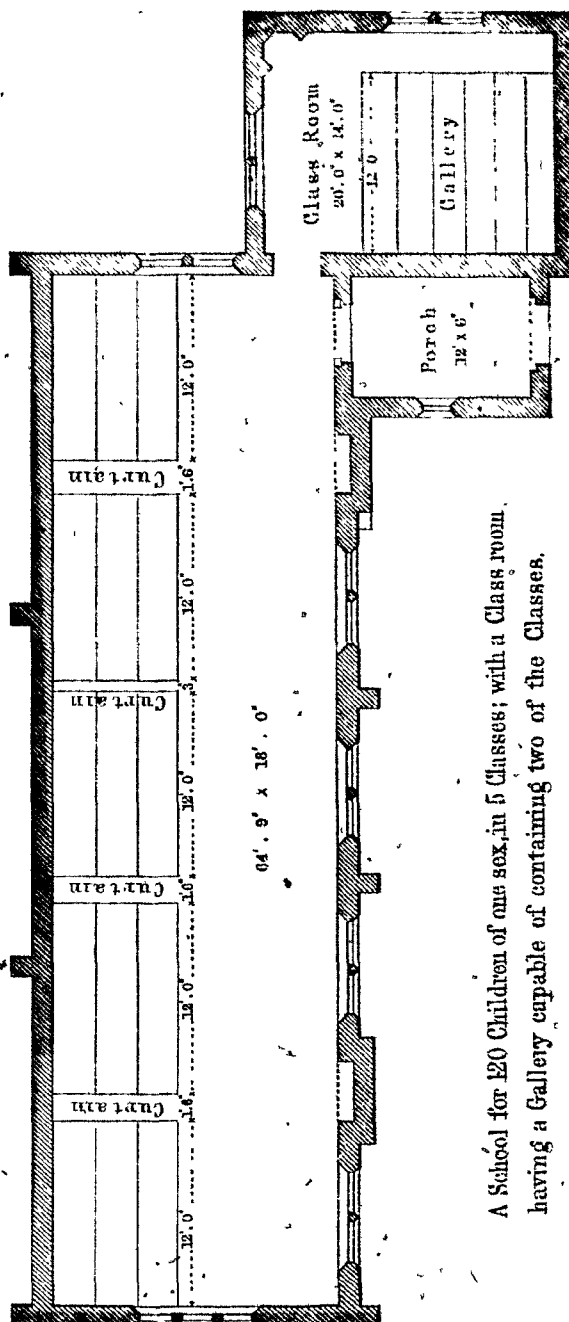




Committee of Council on Education plan, 1840. (Source: Seaborne 1971a)



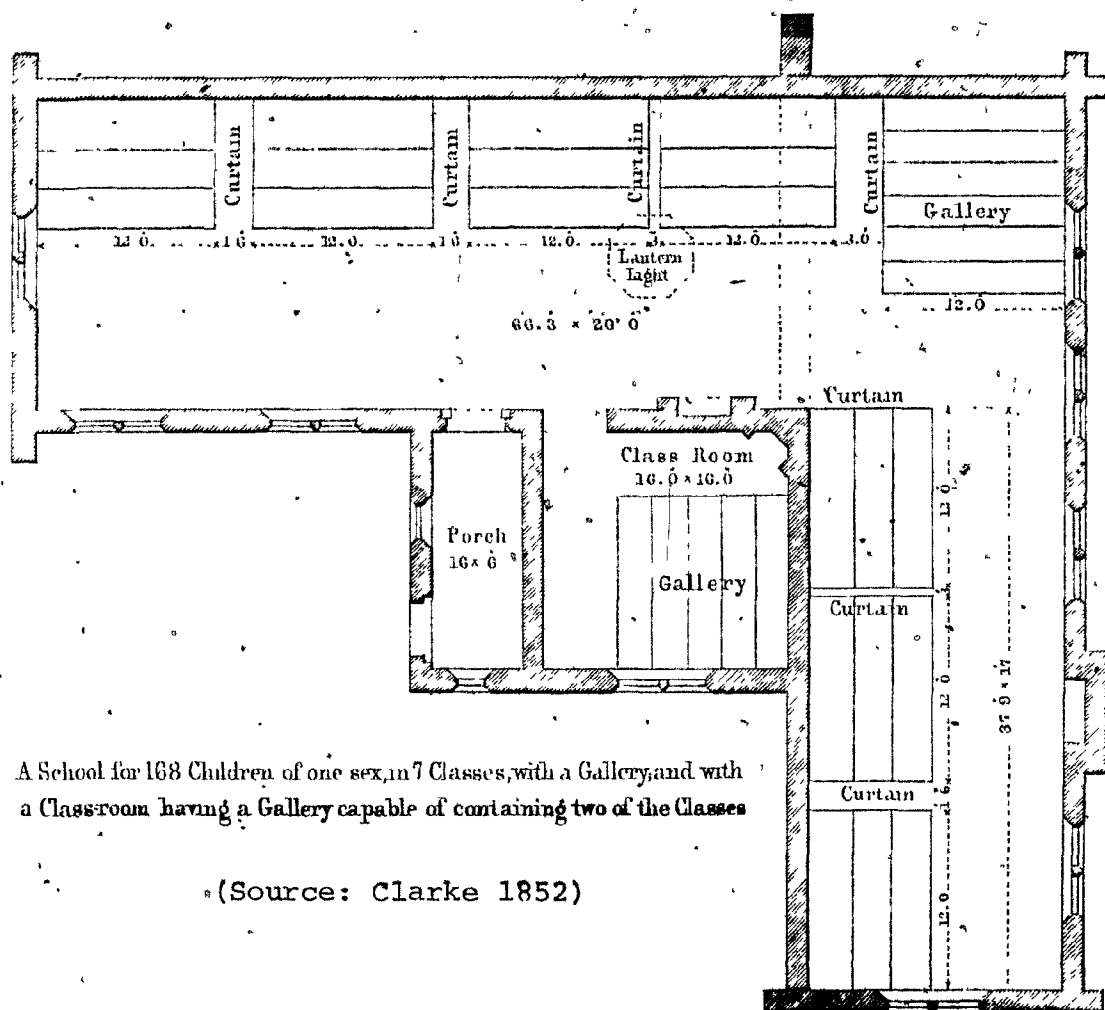
The Committee of Council on Education plan, 1844. (Source: Burchell 1980)



A School for 120 Children of one sex, in 5 Classes; with a Class room, having a Gallery capable of containing two of the Classes.

(Source: Clarke 1852)

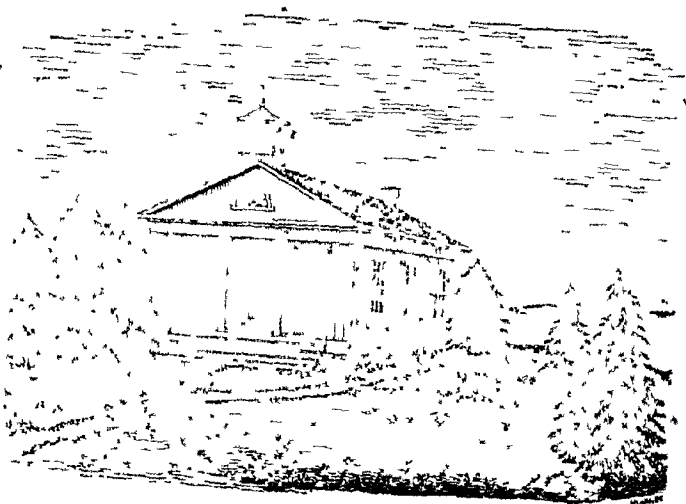
Plate IV/10



<sup>a</sup> (Source: Clarke 1852)



Greek revival school, Windsor, Conn.



Greek revival school, Barrington, R.I. (Source: Barnard  
[1848] 1970)

PLATE I.

FIGURE 1.

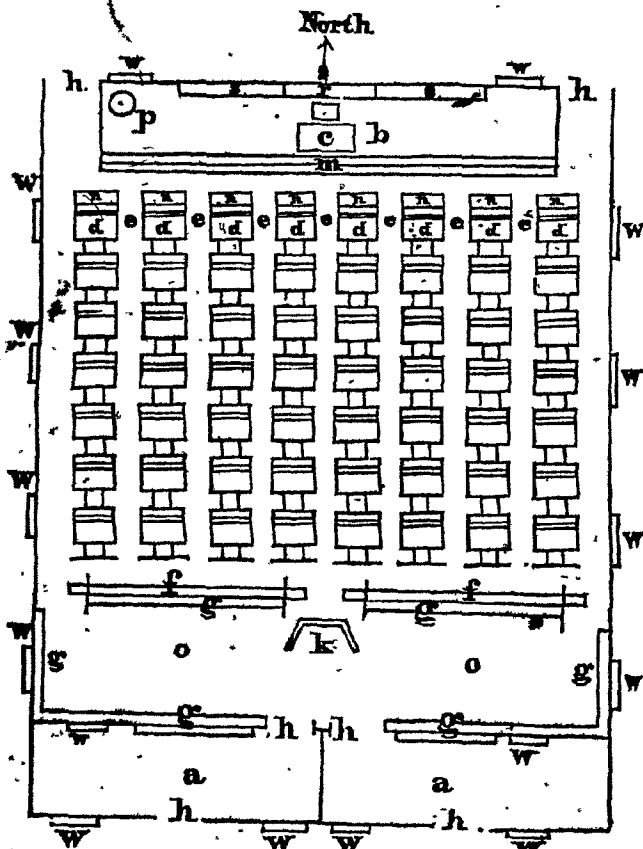
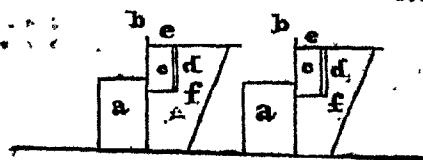


FIGURE 2.



EXPLANATION OF PLATE I.

FIG. 1, THE PLAN OF THE SCHOOL-HOUSE.

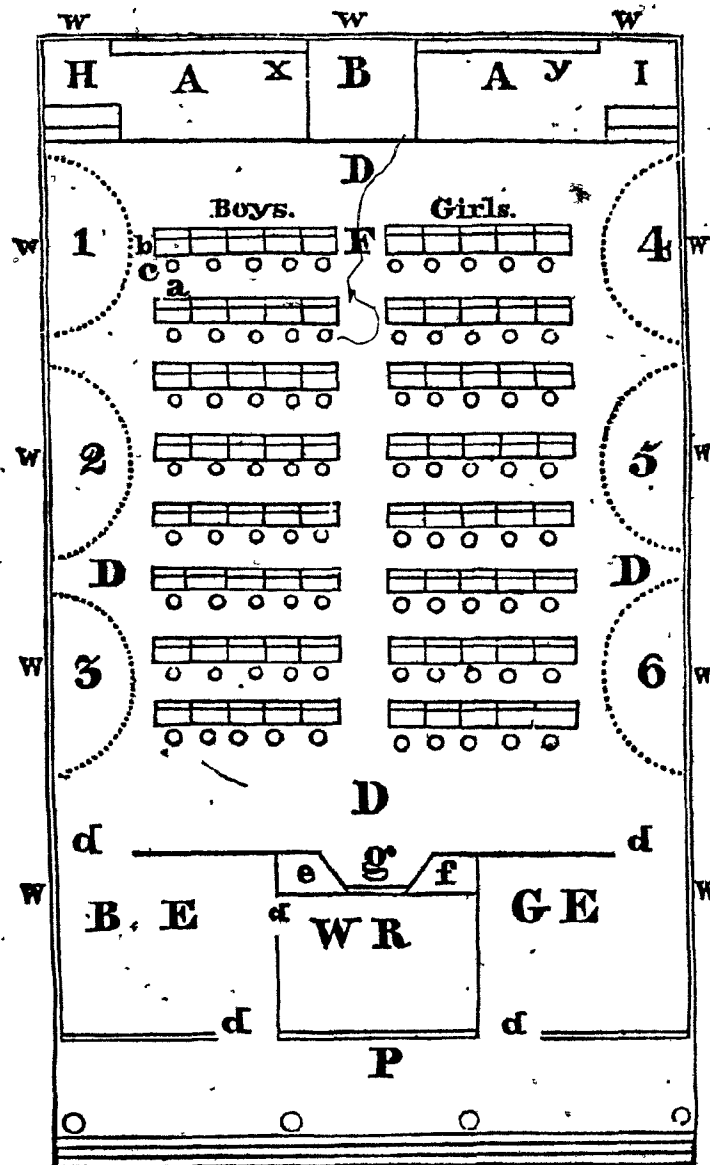
- aa The two entries.
- b The Instructor's platform.
- c Instructor's desk and seat.
- d Desks, 2 feet by 14 inches.
- e Spaces between the rows of desks, 1 1/2 feet wide.
- f Movable black boards.
- g Seats, for those who are reciting, &c.
- k Doors.
- l Stairs.
- m Step for ascending the platform.
- n Seats for small pupils, and for recitation.
- o Space 20 feet by 8, for recitation, &c.
- p Globe.
- r Library.
- s Place of deposit for Museum, &c.
- w Windows.

FIG. 2. SIDE VIEW OF THE DESKS AND SEATS.

- a Seat.
- b Back of the seat, or front of the desk.
- c Case for books, &c.
- d Narrow division for slates, &c.
- e Lid to the book case.
- f Form of the plank which is the principal support of each seat and desk.

(Source: Alcott 1832)

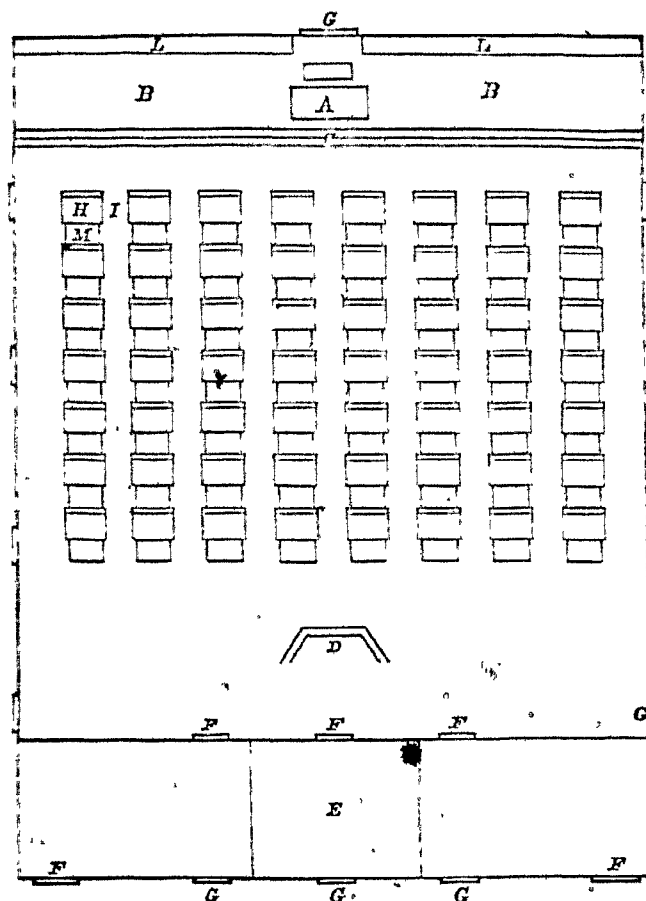
PLATE II.



EXPLANATION OF PLATE II.

- P Door Portico in front of the School-house.  
d, d, d, d Doors.  
B, E Boys' Entry, 12 by 10 feet.  
G, E Girls' Entry, 12 by 10 feet.  
W, R Wood-Room, 11 by 8 feet.  
s Sink-place.  
c Closet.  
s Sink, to be concealed by a falling door balanced with weights.  
D, D, D, D Passage around the room, 6 feet wide.  
1, 2, 3, 4, 5, 6 Stations marked on the floor, to be used by classes when reciting to monitors.  
A, B, C The Teacher's Platform, extending across the room, 6 feet wide and 9 inches high.  
B A part of the Platform, to be removed in the winter, if necessary, to make room for a stove.  
c Cabinet for apparatus, specimens, &c.  
y Book-case.  
H Master's Desk.  
I Assistant or Monitor's Desk.  
F Centre Passage; in the plan drawn 3 feet wide, but 4 feet would be better.  
s Scholars' Desks, 18 inches wide and 2 feet long.  
s Scholars' Seats.  
d Passages between the seats and the next row of desks, 15 inches wide. A desk, seat, and passage, occupy 4 feet; viz. desk 18 inches, space between the desk and seat 3 inches, seat 13 inches, and passage 15 inches.  
w, w, &c. Windows, which should be placed high from the floor.  
The scale on which Plate II. is drawn, is one tenth of an inch to a foot.

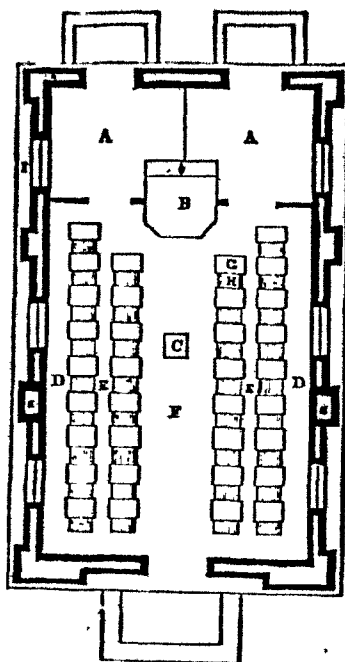
(Source: Alcott 1832)



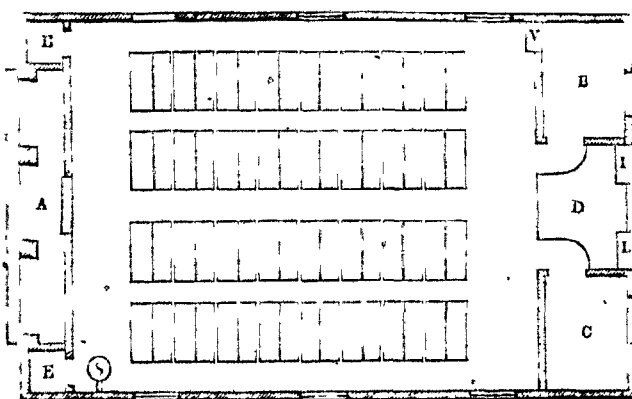
A—Represents the teacher's desk. B,B—Teacher's platform, from 1 to 2 ft. in height. C—Step for ascending the platform. L,L—Cases for books, apparatus, cabinet, &c. H—Pupils' single desks, 2 ft. by 18 inches. M—Pupils' seat, 1 ft. by 20 inches. I—Aisles, 1 ft. 6 inches in width. D—Place for stove, if one be used. E—Room for recitation, for retiring in case of sudden indisposition, for interview with parents, when necessary, &c. It may also be used for the library, &c. F,F,F,F—Doors into the boys' and girls' entries—from the entries into the school-room, and from the school-room into the recitation room. G,G,G,G—Windows. The windows on the sides are not lettered.

Plan for a one-room school by Horace Mann. (Source: Barnard [1848] 1970)





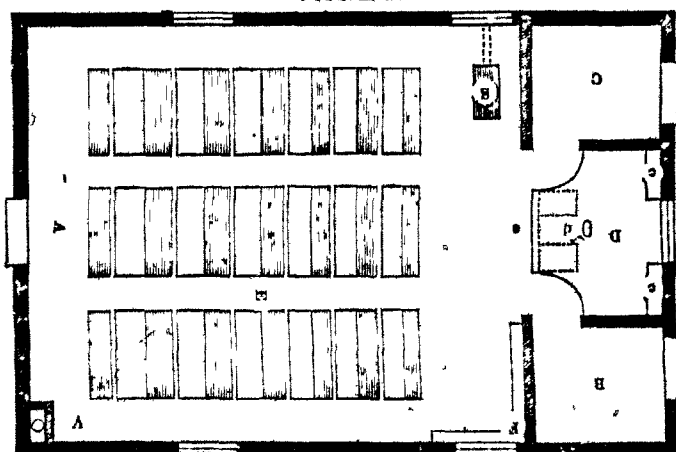
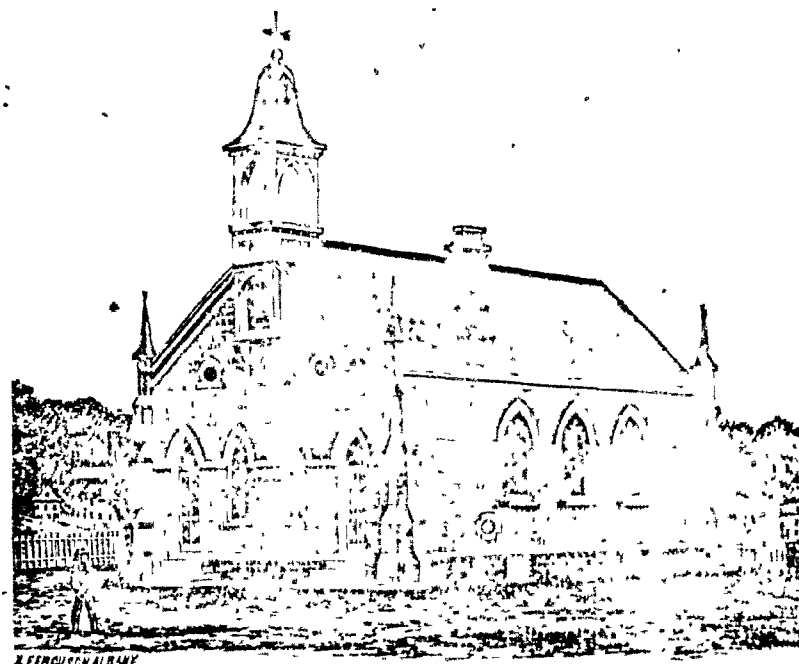
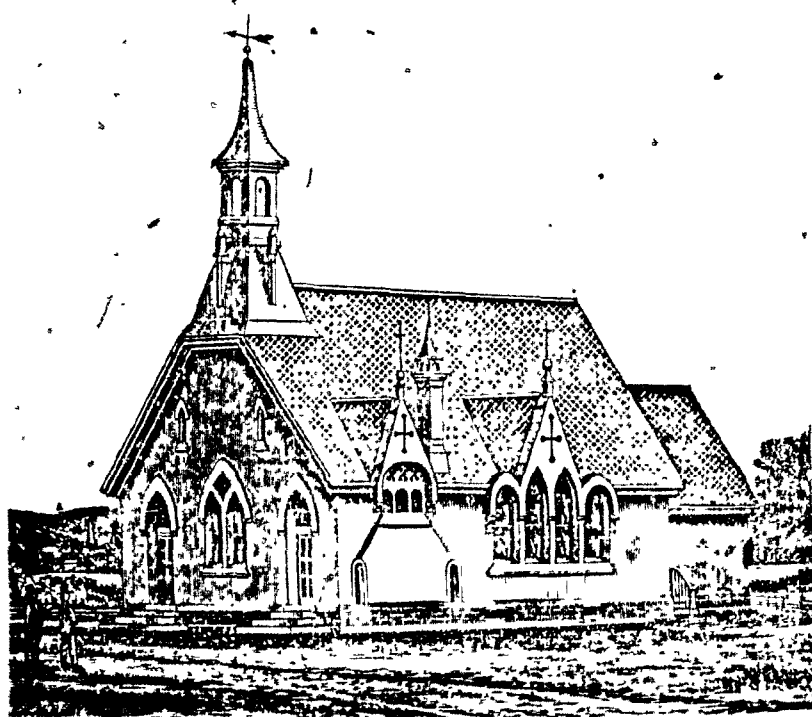
One-room school, Windsor, Conn. See also IV/12.



A—Front entrance. B—Girls' entrance and lobby, fitted up with mats, scrapers, books, shelves. C—Boys' entrance. D—Teacher's platform. S—Boston Ventilating Stove. V—Flue for ventilation surmounted, by Emerson's Ejector. L—Cases for library. E—Closets for apparatus, &c.

One-room school, Barrington, R.I. See also IV/12.

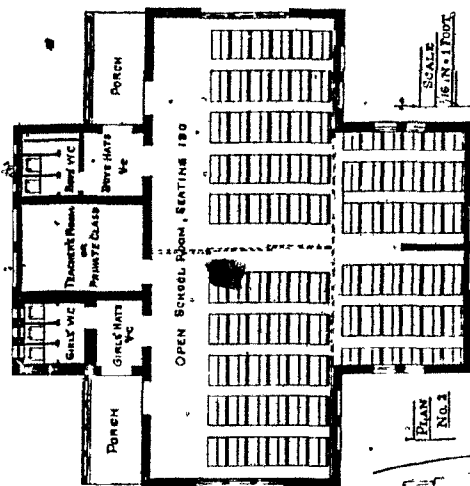
(Source: Barnard [1848] 1970)



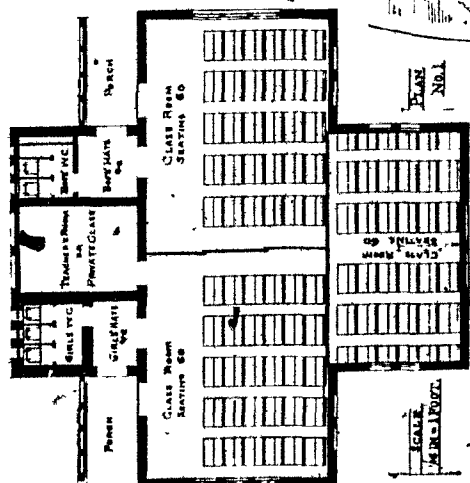
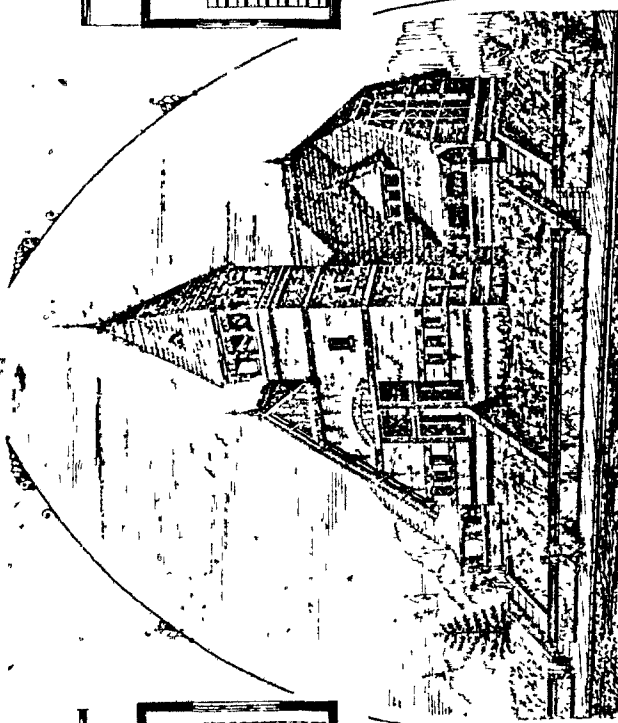
Plans of one storey schools with model ground plan which could be adapted with modifications. (Source: Hodgins 1876)

Plate IV/17

(Source: Bicknell's... 1878)

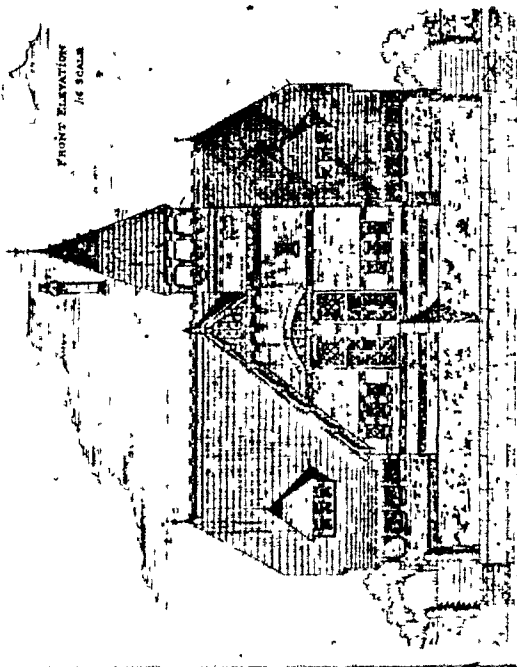


PLAN SHOWING THE ROOM WITH THE SLIDING PARTITIONS DRAWN BACK, THROWING THE CLASS ROOMS INTO ONE LARGE ROOM SEATING 180 PUPILS

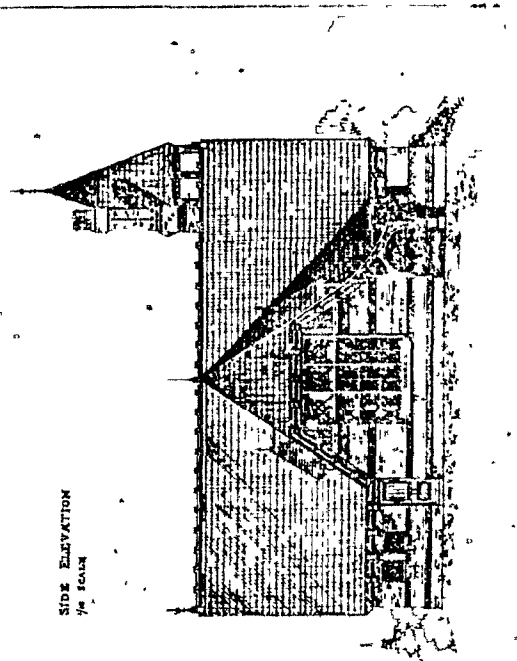


PLAN SHOWING THE ROOM WITH THE SLIDING PARTITIONS CLOSED, FORMING THREE CLASS ROOMS SEATING 60 PUPILS EACH

PERSPECTIVE VIEW



FRONT ELEVATION 1/8\"/>

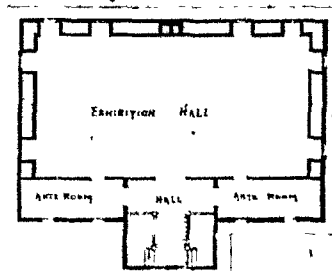


SIDE ELEVATION 1/8\"/>

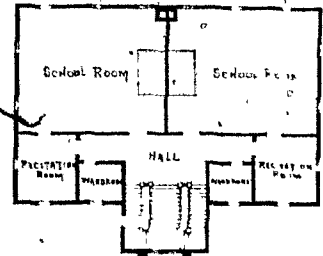
DESIGN  
BY A.  
VILLAGE  
SCHOOL HOUSE

R. H. ROBERTSON,  
ARCHITECT  
34 WILLIAM ST.  
NEW YORK

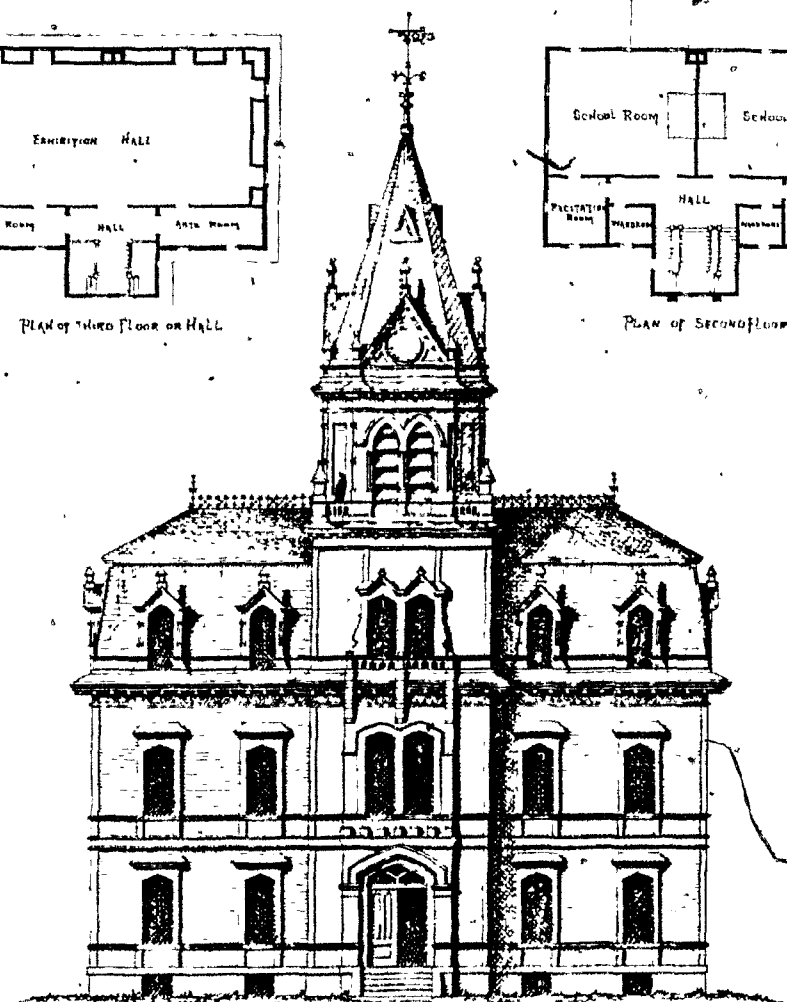
(Source: Ricknell's... 1878) -



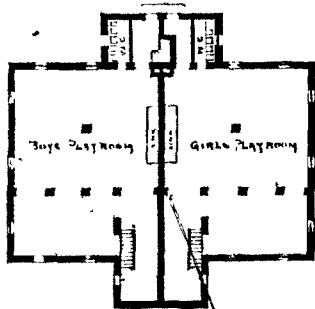
PLAN OF THIRD FLOOR OR HALL



PLAN OF SECOND FLOOR



FRONT ELEVATION

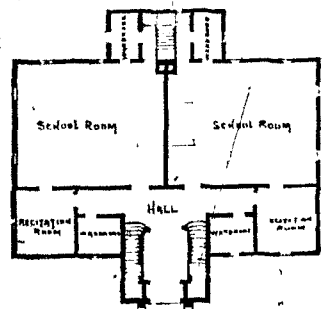


PLAN OF BASEMENT

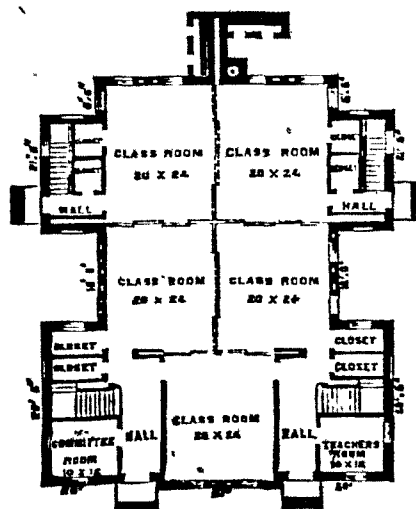
DESIGN  
FOR A  
SCHOOL HOUSE  
BY  
HENRY J. LESTER ARCHT  
18 FORTMOUTH ST  
BOSTON

Scale of Plans  
1/8 inch = one foot

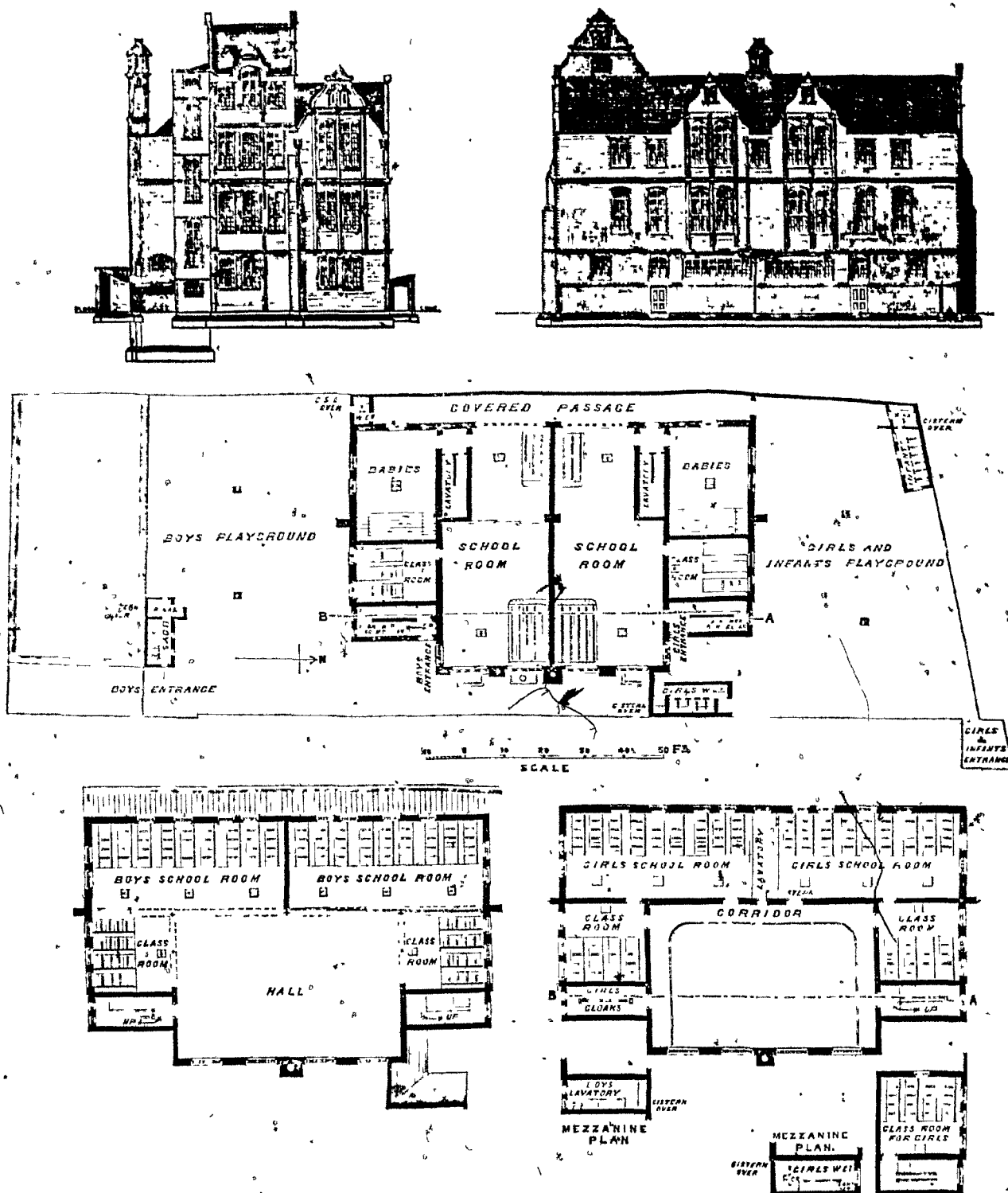
Scale of Elevation  
1/8 inch = one foot



PLAN OF FIRST FLOOR

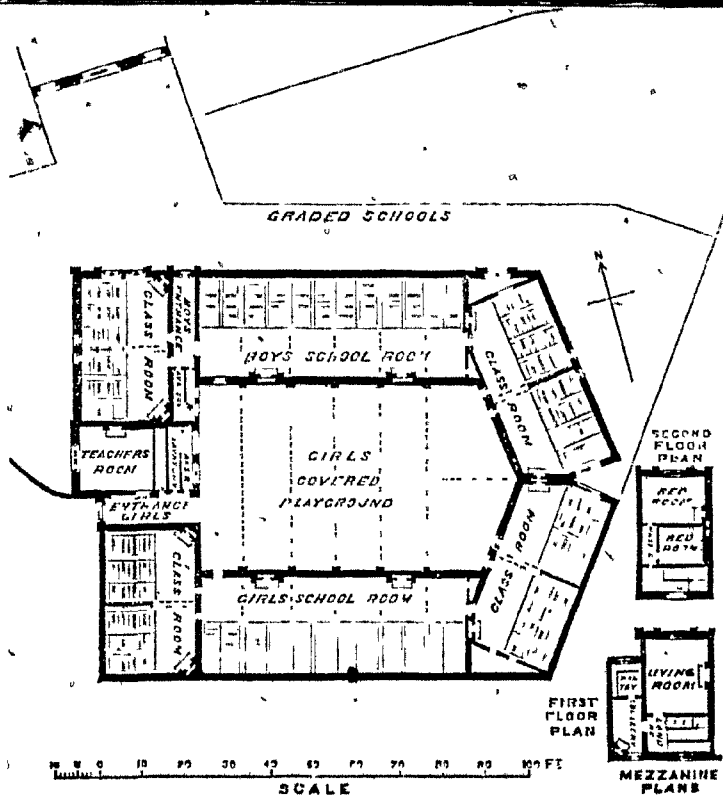


Wood Street School, Philadelphia, U.S. (Source: Robson 1874)

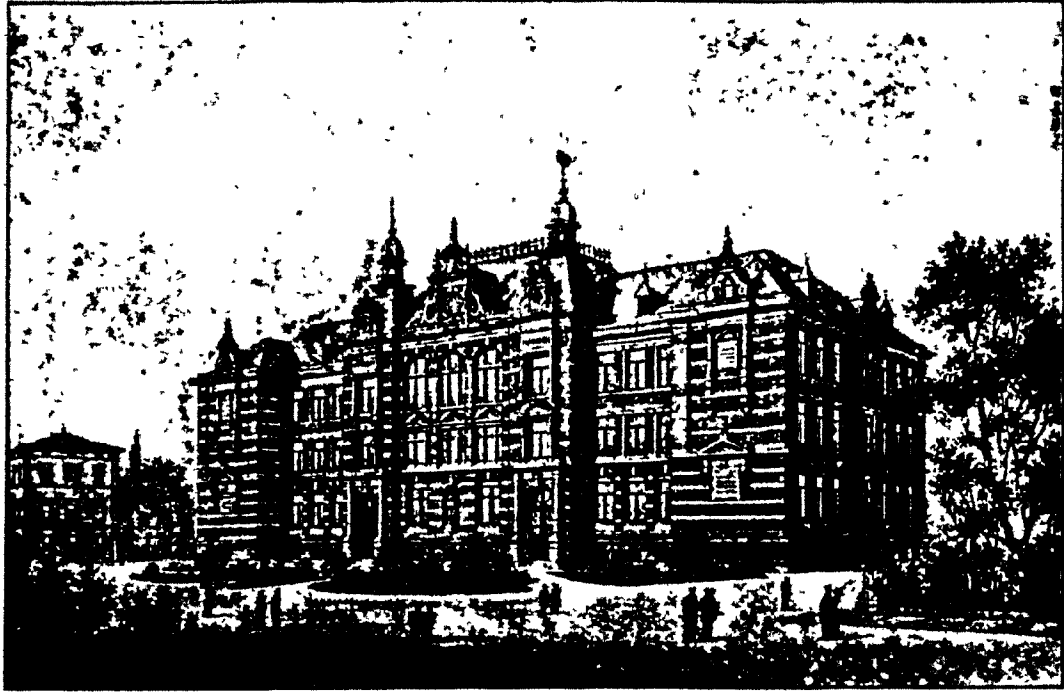


Elevations, ground plan and plans of first (left) and second (right) floors, North Street School, London. (Source: Robson 1874)

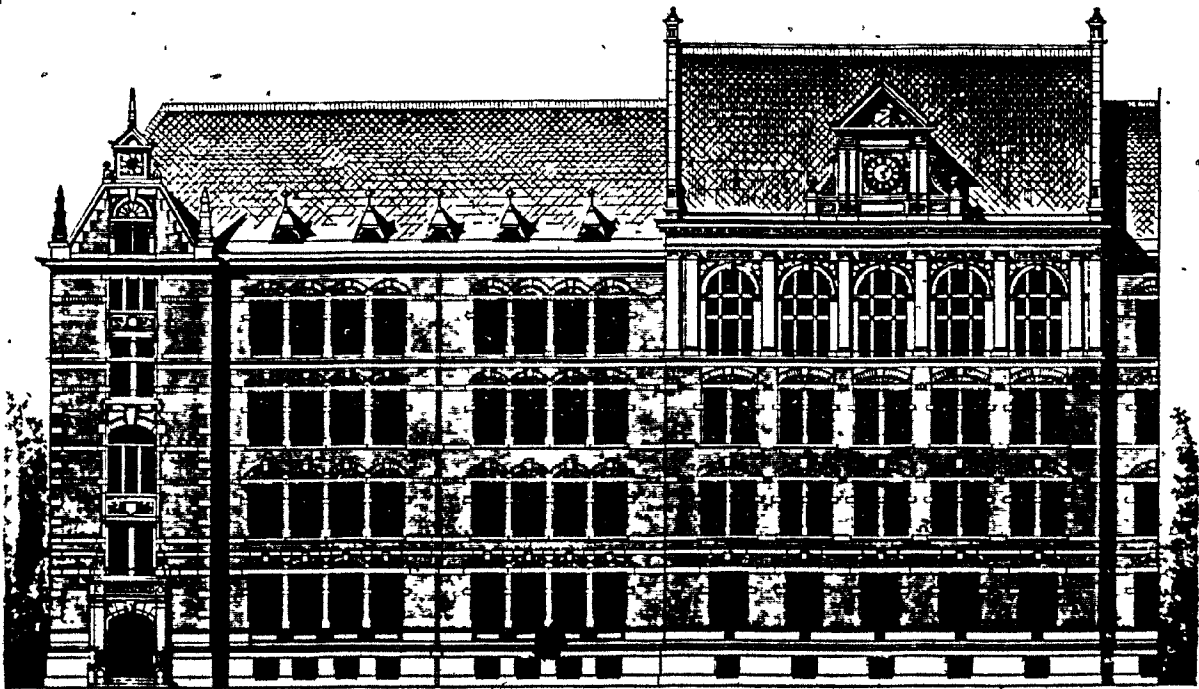




Haverstock Hill School, London. (Source: Robson 1874)

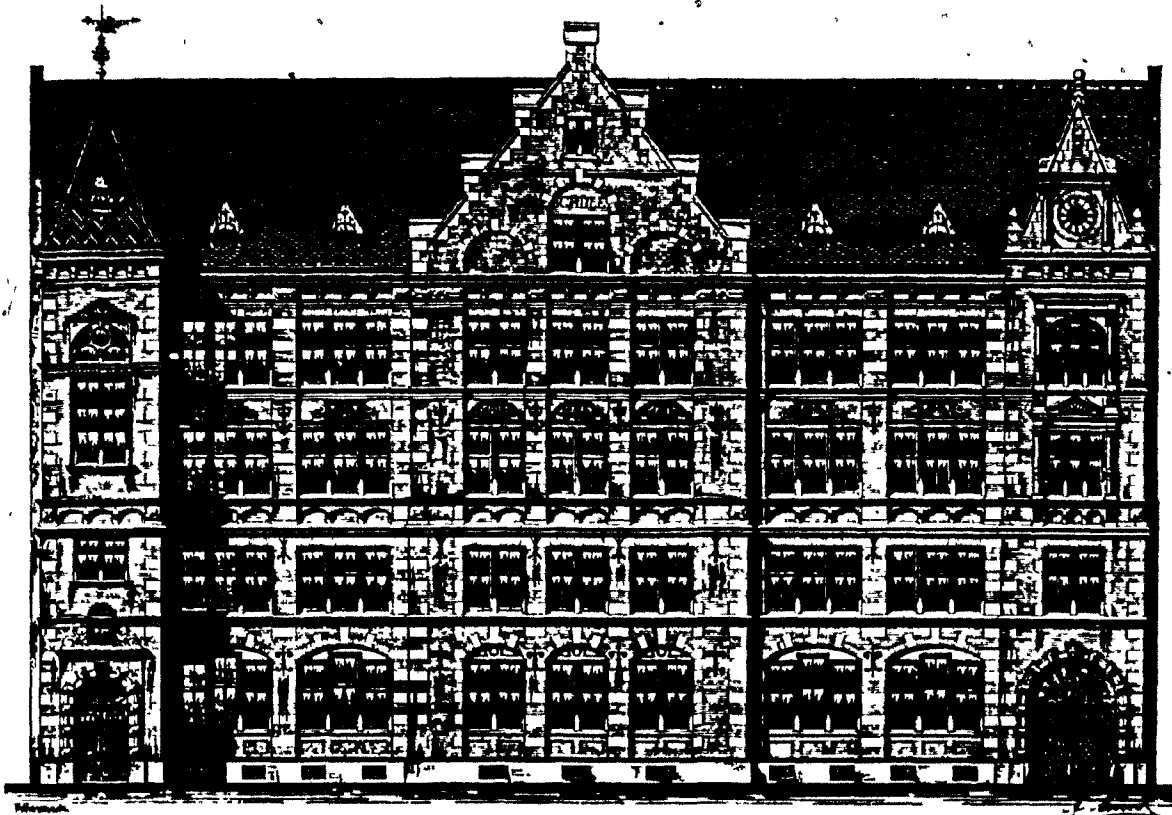


Elementary school in Jena, 1892.

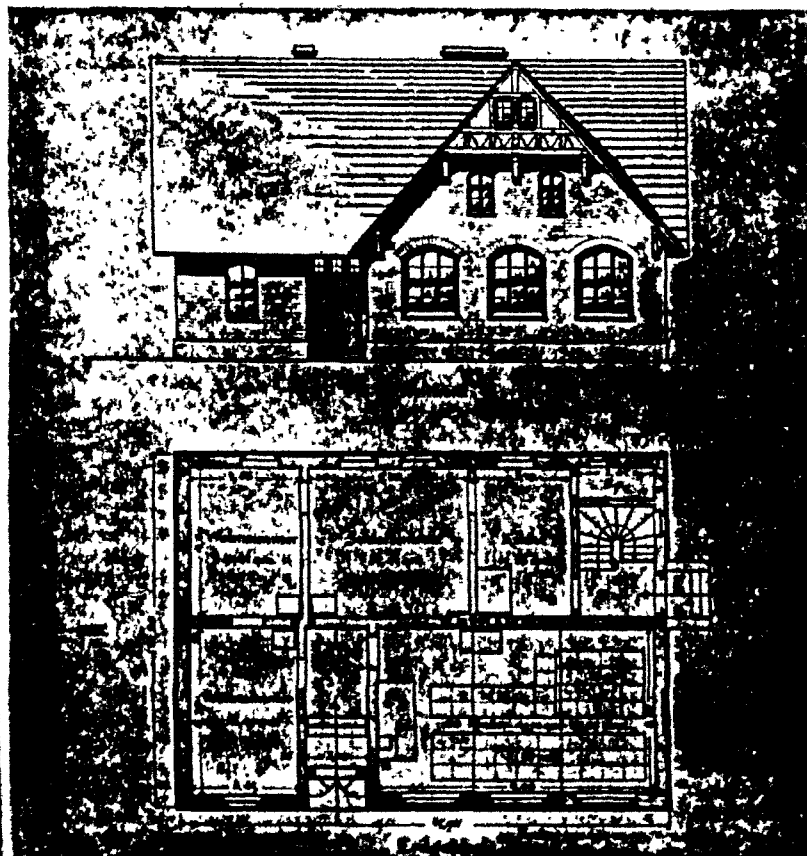
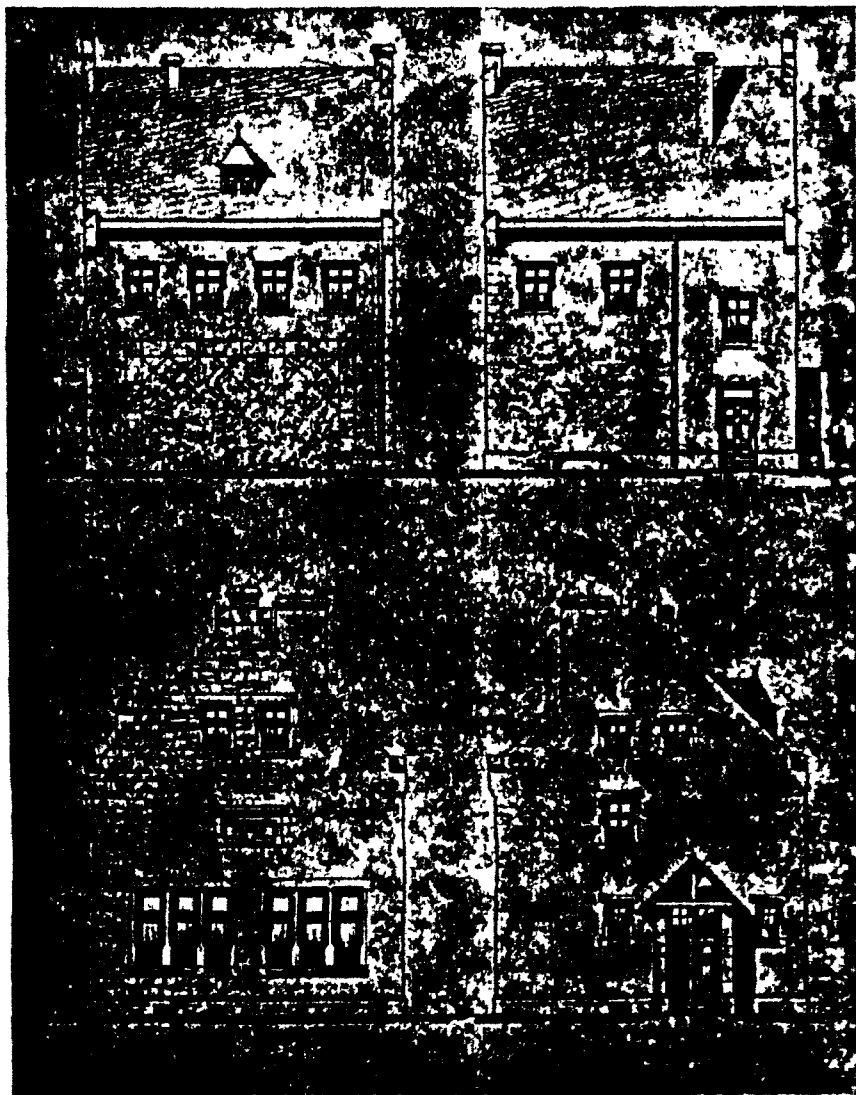


Design for a 36 classroom elementary school.

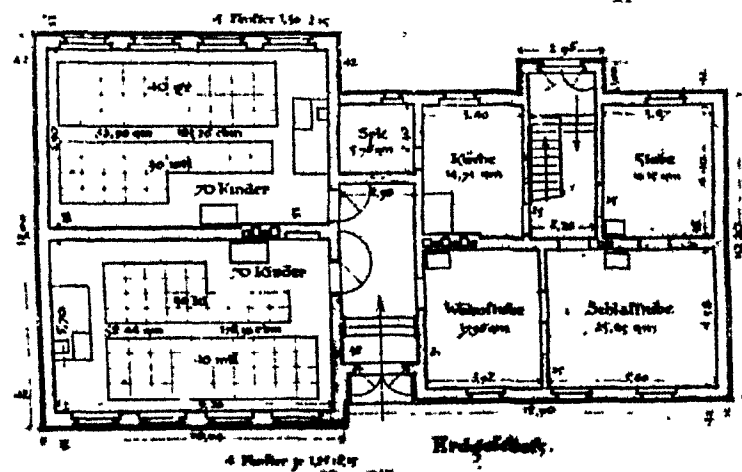
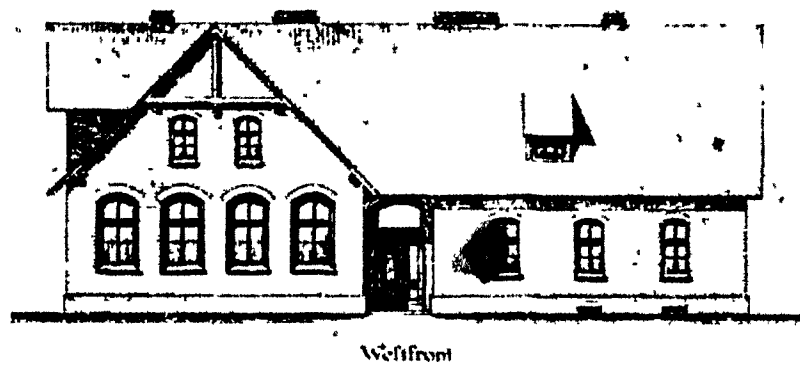
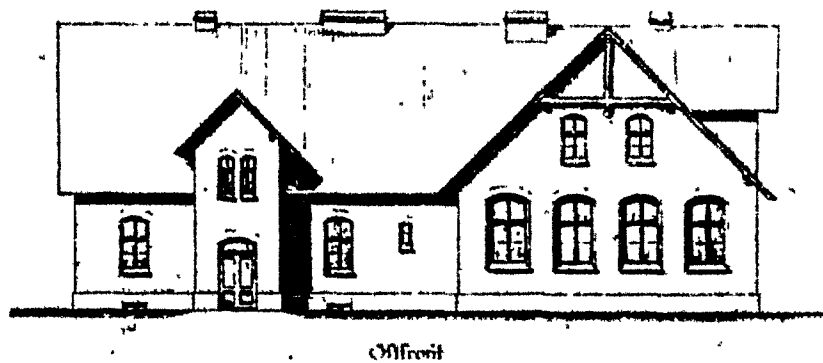
(Source: Schmidt 1967)



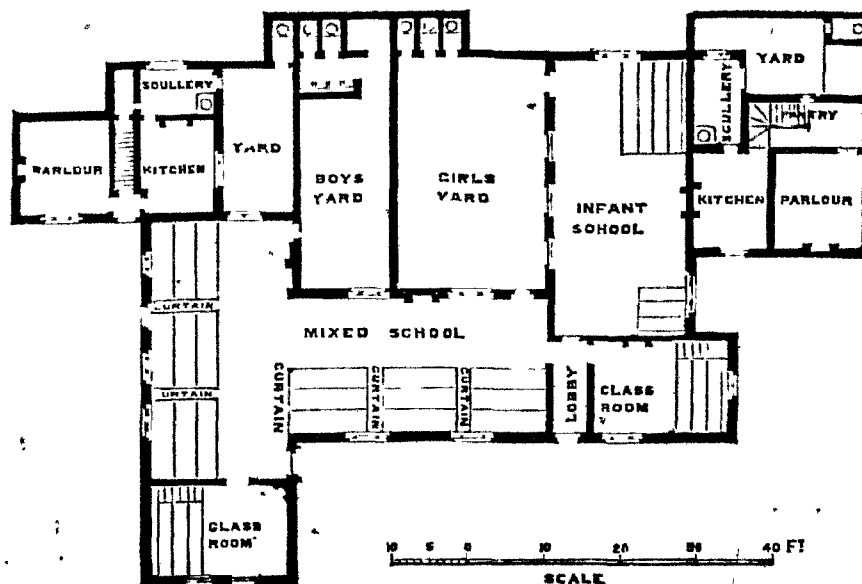
Elementary school in München, 1888-9. (Source: Schmidt 1967)



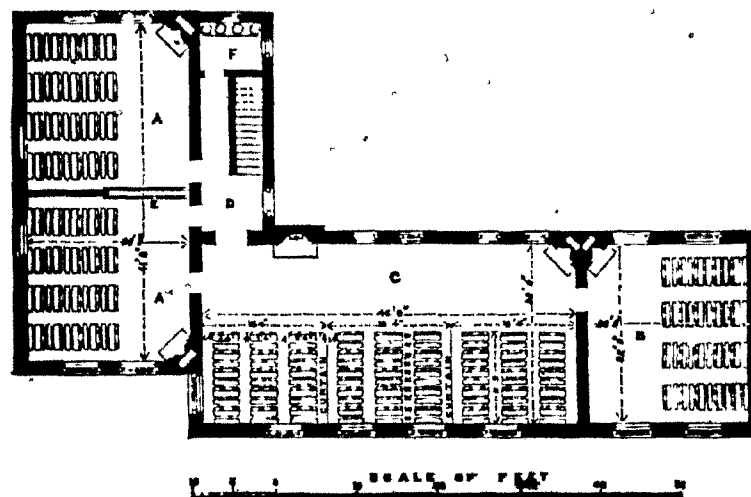
German one-room school, 1895. (Source:  
Schmidt 1967)



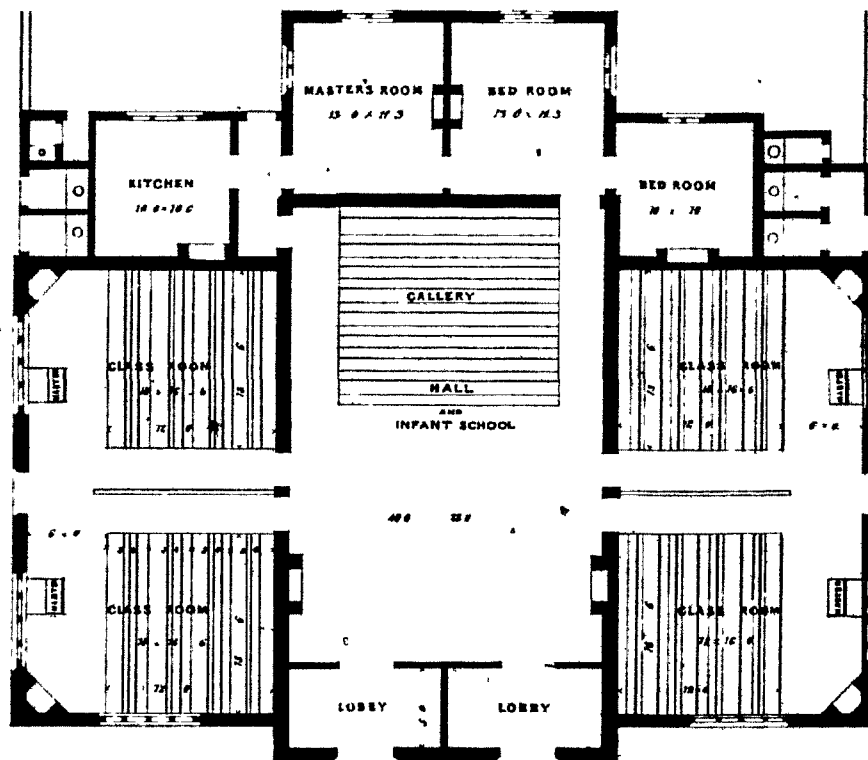
German two classroom school, 1895. (Source: Schmidt 1967)



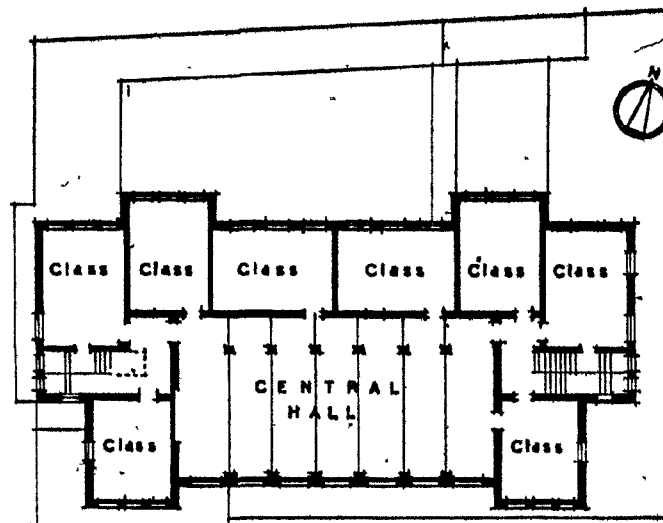
Infants' and "mixed" school for 250, as suggested by the Education Department. (Source: Robson 1874)



Graded school, 1874. (Source: Rohson 1874)



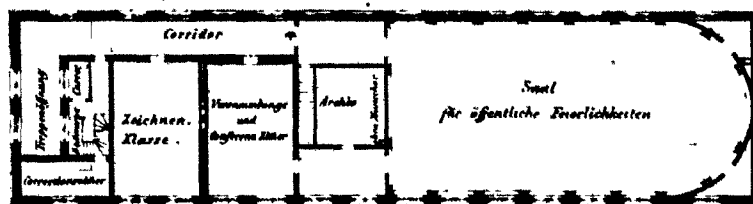
Committee of Council on Education's plan, 1840.  
 \*(Source: Lange 1967)



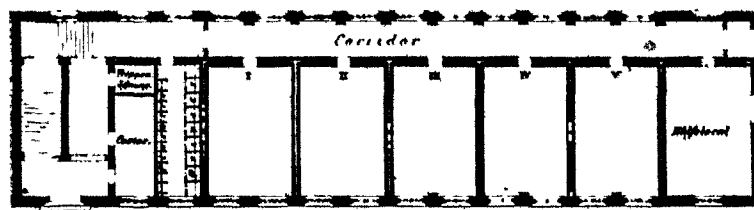
FIRST FLOOR PLAN  
 0 20 40 60 80 100 ft.

Ben Jonson School, London, 1872. (Source: Godfrey -  
 Castle Cleary 1953)

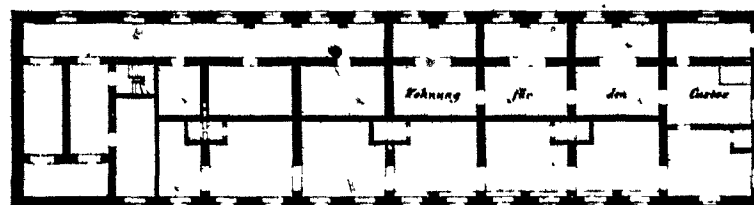




*Grundplan der 2ten Etage*



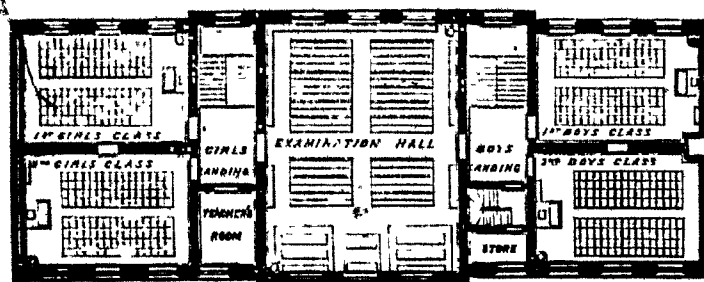
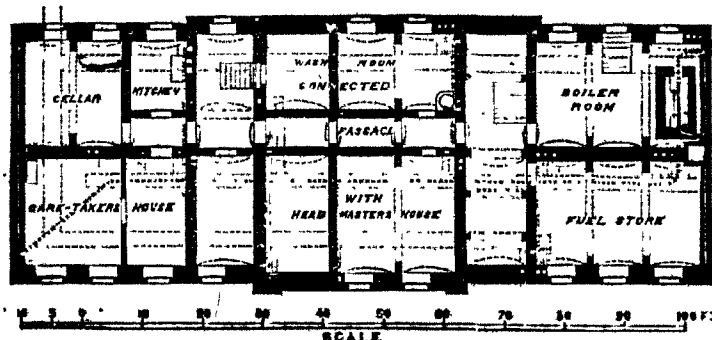
*Grundplan der 1ten Etage.*



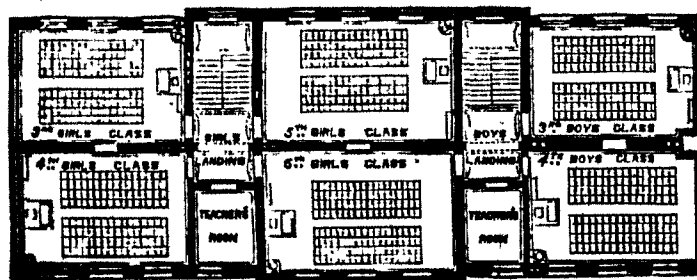
*Grundplan vom Kellergeschoß.*



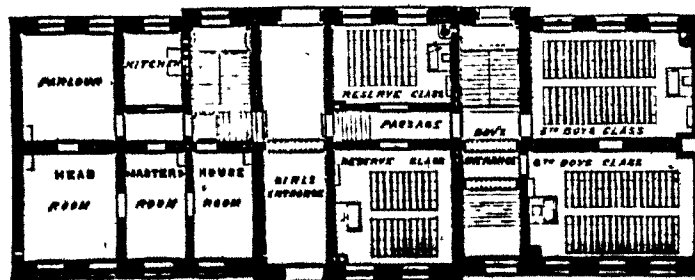
Johanneum, Hamburg, 1840. (Source: Lange 1967)



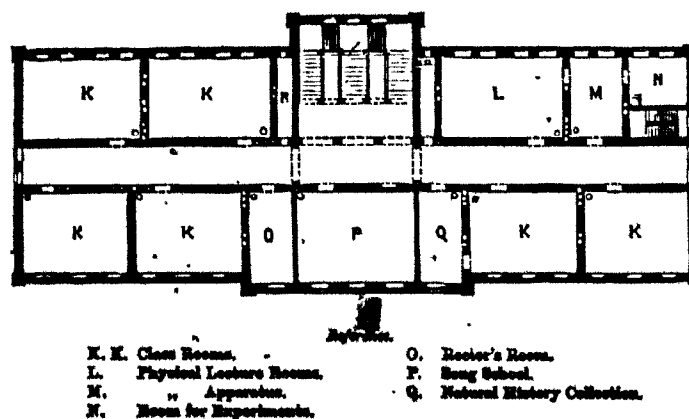
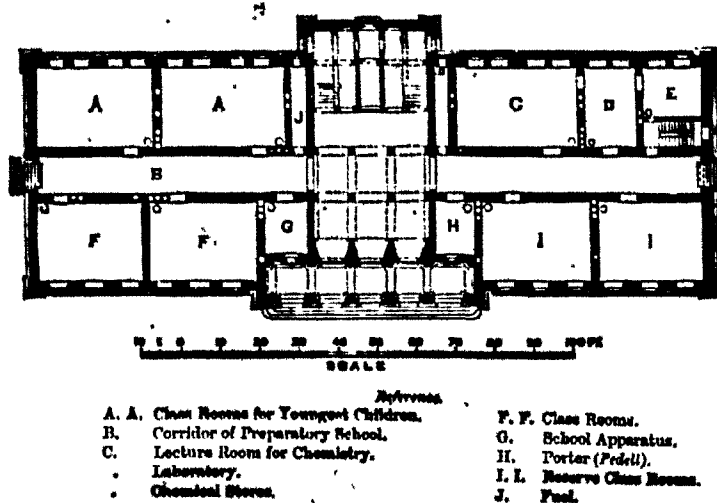
PLAN OF SECOND FLOOR.



PLAN OF FIRST FLOOR.

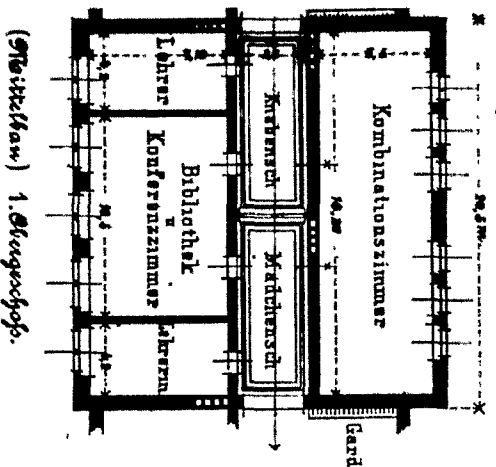


Plans of basement, ground floor, first and second floors,  
Gemeindeschule on Kurfürstenstrasse, Berlin. (Source:  
Robson 1874)



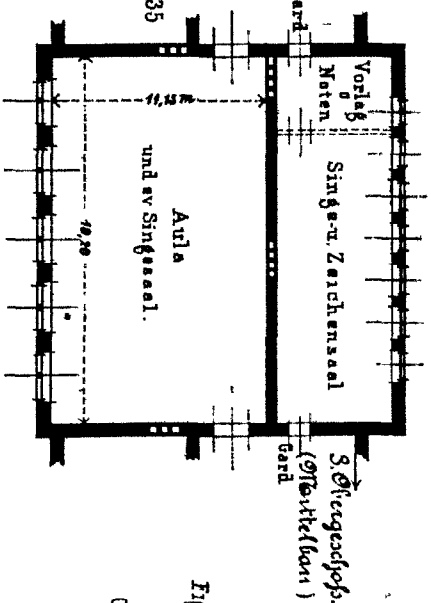
Ground plan and plan of first floor, Höhere Bürgerschule, Wiesbaden. (Source: Robson 1874)

Entwurf zu einer großräumigen Stadtschule,  
mit abtiegender Grundfläche, 2. Stufen-



(Stützwand) 1. Etage.

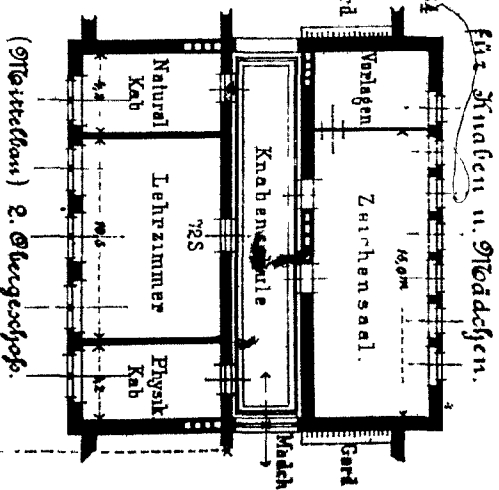
Fig 35



(Stützwand) 3. Etage.

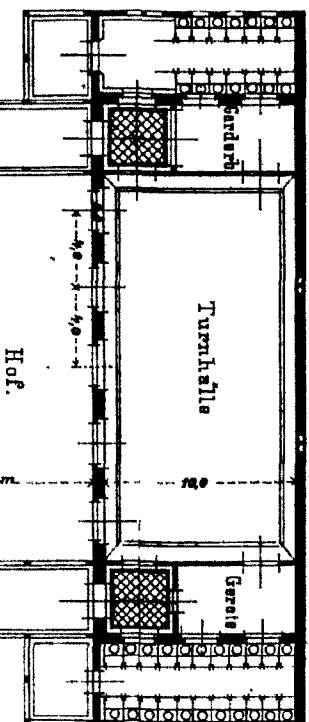
36 Klassen und Zeitungsraum,  
u. Singersaal, sowie Aula

Fig 34

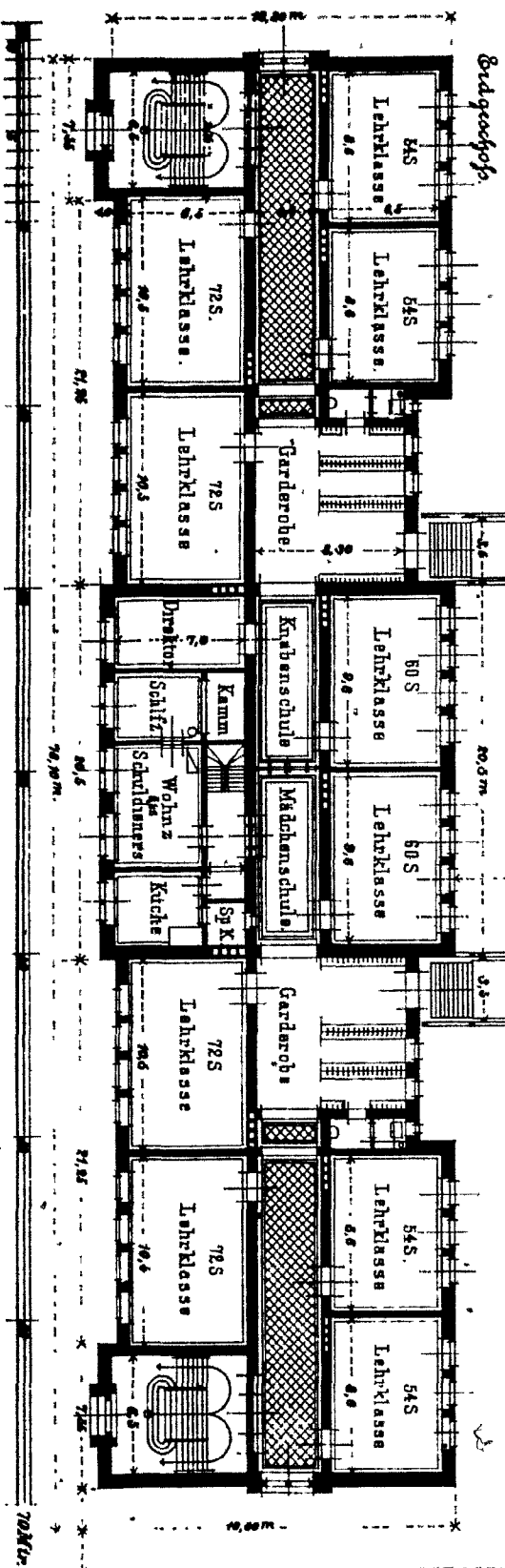


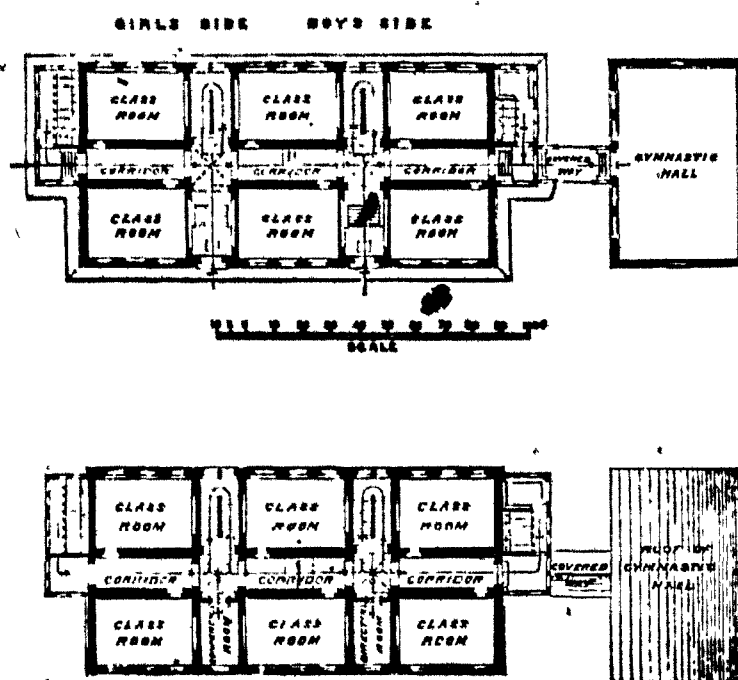
(Stützwand) 2. Etage.

Spielplatz



Spielplatz





Ground plan and plan of first floor, Bürgerschule, Dresden.  
(Source: Robson 1874)

## Two Pictures—Unventilated and Well Ventilated School-Houses.

### FIRST PICTURE—IN AN UNVENTILATED SCHOOL-HOUSE.

In a school-room small and low,  
This is the way the minutes go—  
If you further wish to know,  
Call, and facts will plainly show :

Eyelids drooping,  
Figures stooping ;  
Classes listless,  
Scholars restless ;  
Teacher weary,  
School-room dreary ;  
Looking sadly,  
Lessons badly ;  
Many sighing,  
Some are crying ;  
Others idling,

Sitting sideling ;  
Left their seat  
To pinch or beat ;  
Study loudly,  
Answer proudly ;  
Circumvention  
Claims attention ;  
Air is horrid,  
Faces florid ;  
Learning never,  
Sickness ever.

### SECOND—THE PICTURE REVERSED—IN A WELL VENTILATED SCHOOL-HOUSE.

To a school-room large and airy,  
Hastens many a little fairy ;  
Flowers are blooming all around,  
Wide and smooth the green play-ground ;  
Boughs are waving in the breeze,  
Birds are singing in the trees,  
Sunlight streaming gayly over  
Fields of waving grain and clover ;  
Some are shouting, some are singing,  
Till the clear-toned school-bell ringing,  
Calls them from their happy play  
To the labours of the day.

Sunny looks and rosy faces,  
Weaving childhood's dreams and graces  
Bow in solemn silence there  
While they hear the morning prayer ;  
And each sparkling eye is lit  
By its fringed and drooping lid.

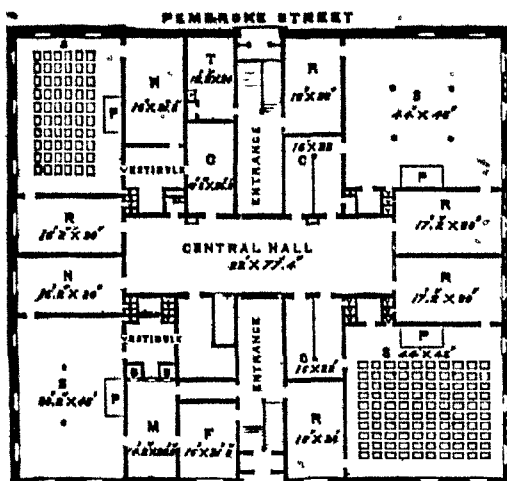
—*Connecticut C. S. Journal.*

Softly falls, with holy seeming,  
Love, from realms of glory streaming,  
While each spirit eye is open  
To behold some heavenly token  
Of a blessing on the hours  
They shall spend in learning's bowers.

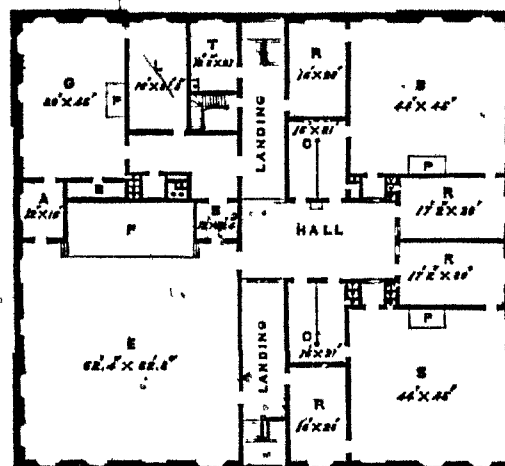
Happy seems each little creature—  
Happy, too, their smiling teacher,  
While mid truth and bloom and song,  
Glide the rapid hours along.

Those young hearts are learning well,  
Nature's most enchanting spell ;  
Souls to holier life are bounding  
By the influence surrounding ;  
Spirits plume their new-fledged pinions  
For a holier home's dominions ;  
And in wisdom's pleasant ways,  
Flaunt the morning of their days.

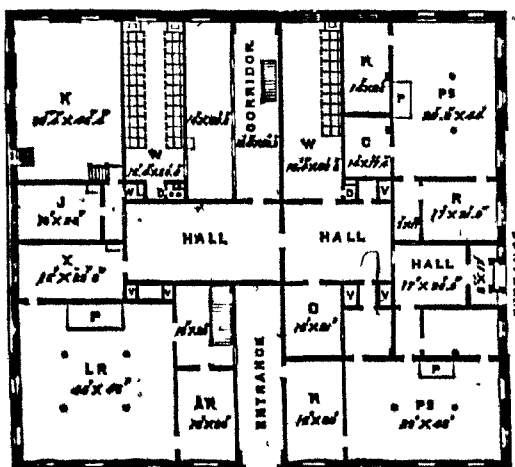
(Source: Hodgins 1876)



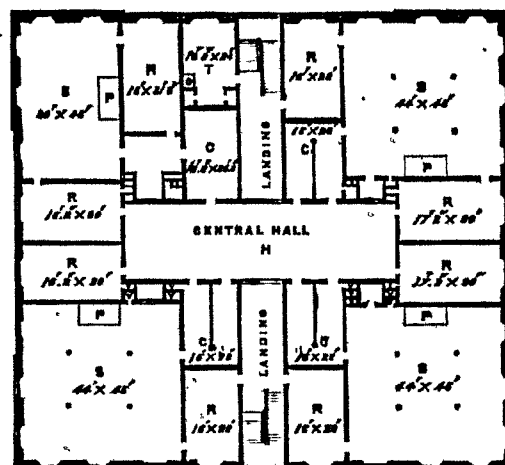
NEWTON ST.  
GROUND FLOOR PLAN



SECOND FLOOR PLAN.



BASEMENT

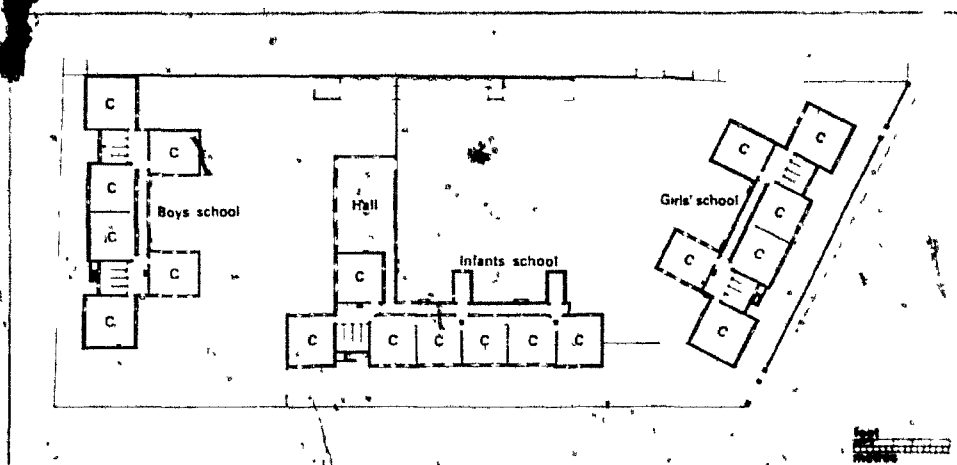


FIRST FLOOR PLAN

- Reference.
- |                    |                              |
|--------------------|------------------------------|
| B. Airflues        | R. Recitation Room.          |
| C. Cloak Rooms.    | L. R. Chemical Lecture Room. |
| F. Waiting Room.   | P. S. Class Rooms.           |
| J. Janitor's Room. | T. Mistress' Dressing Room.  |
| K. Boiler Room.    | W. - Labrins.                |
| M. Teacher's room. | X. Laboratory.               |
| N. Library.        |                              |

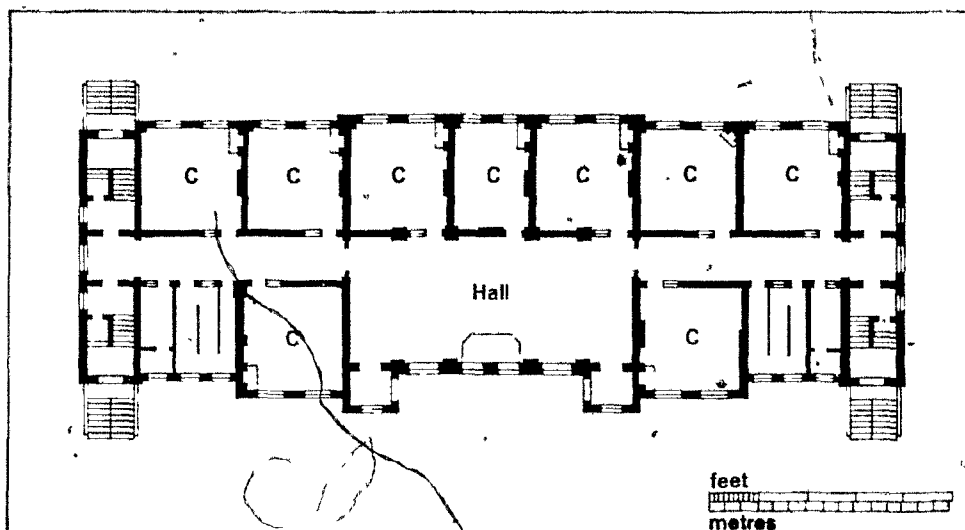
- Reference.
- |                        |                             |
|------------------------|-----------------------------|
| C. Cloak Room.         | L. Apparatus Room.          |
| E. Assembly Hall.      | R. Recitation Rooms.        |
| G. Drawing Class Room. | S. Class room.              |
| H. Central Hall.       | T. Mistress' Dressing Room. |

Girls' School, Boston, Mass. (Source: Robson 1874)

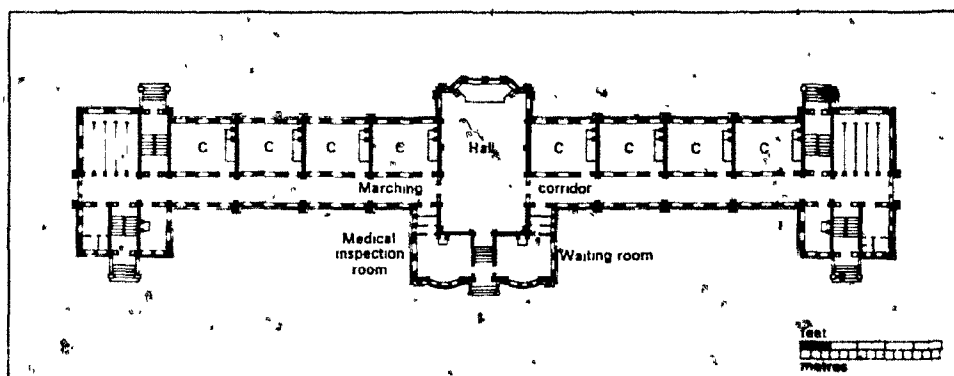


Dorsett Road Elementary School, Darlaston, Staffordshire,  
1907. (Source: Seaborne-Lowe 1977)

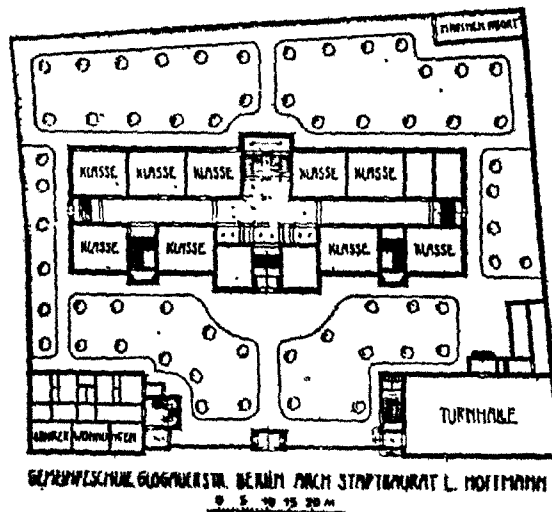




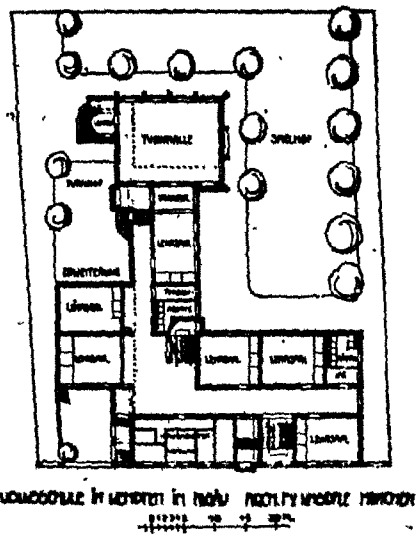
Pelham Elementary School, Wimbledon, 1909. (Source: Seaborne-Lowe 1977)



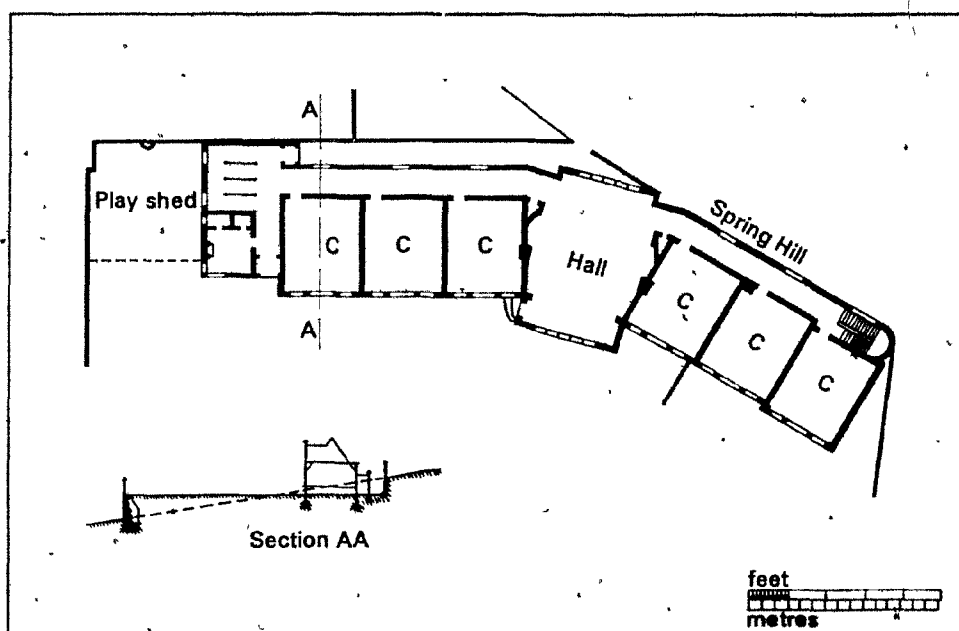
Durnsford Elementary School, Wimbledon, 1910.  
(Source: Seaborne-Lowe 1977)



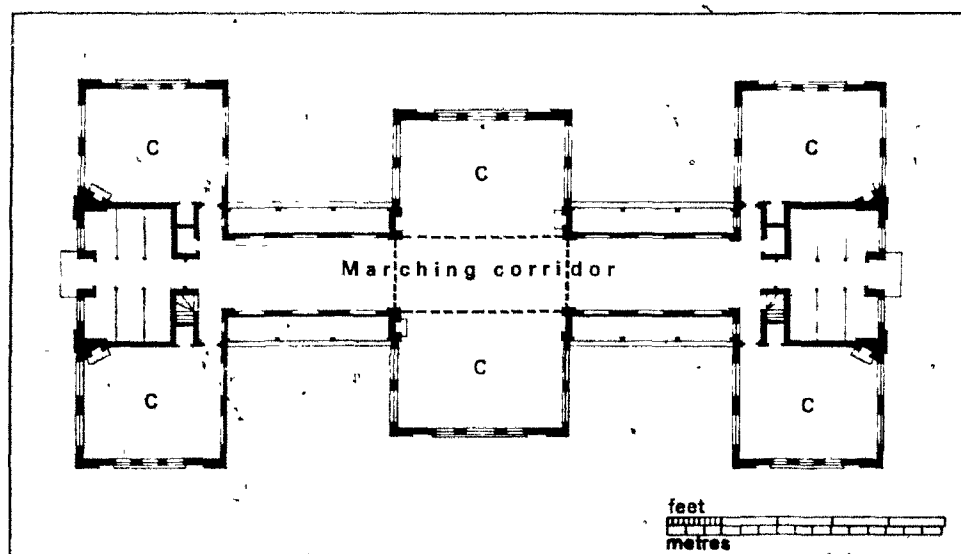
School on Glogauer Strasse, Berlin, 1909. (Source: Schmidt 1967)



School in Kempton, 1909. (Source: Schmidt 1967)



Spring Hill Elementary School, Lincoln, 1910.  
(Source: Seaborne-Lowe 1977)

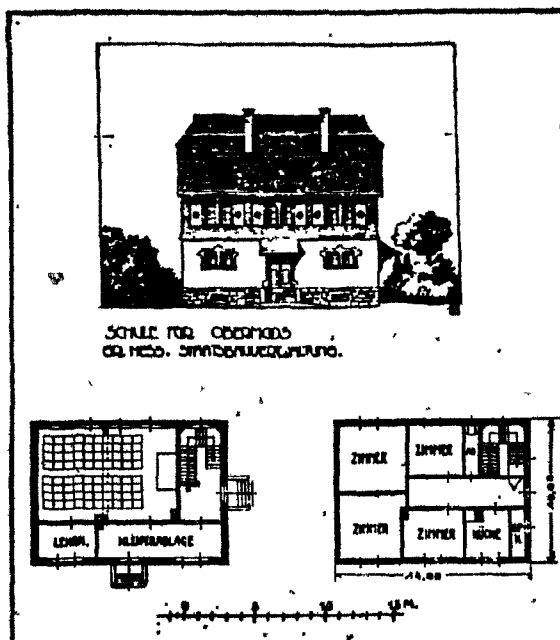


Highfields Elementary School, Long Eaton, 1911.

(Source: Seaborne-Lowe 1977)

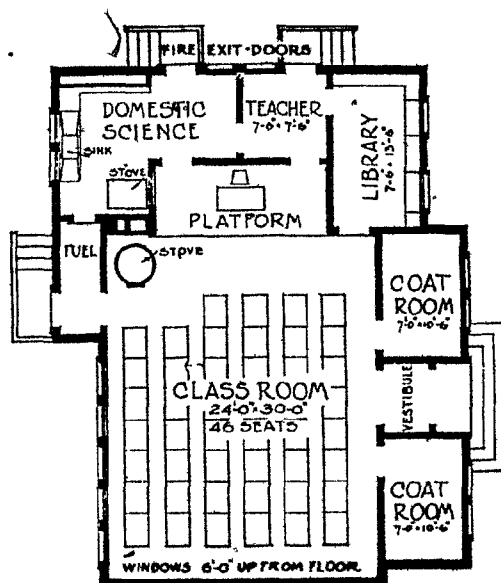
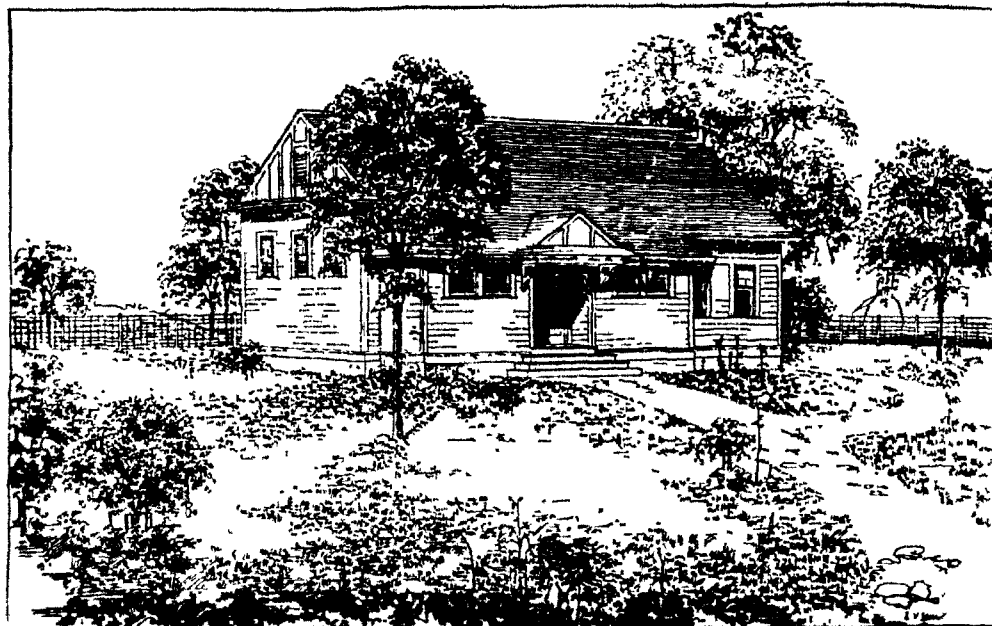


School in Unterschmitt, Hessen, 1909.

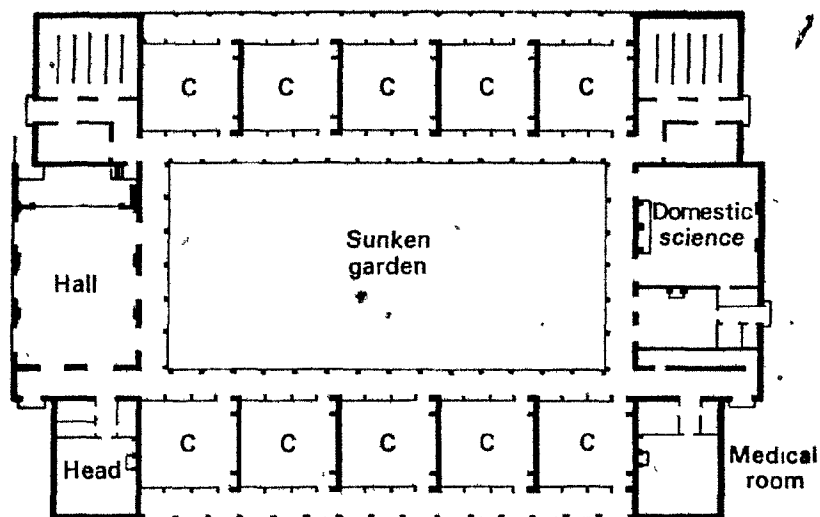


School in Obermoos, Hessen, 1909.

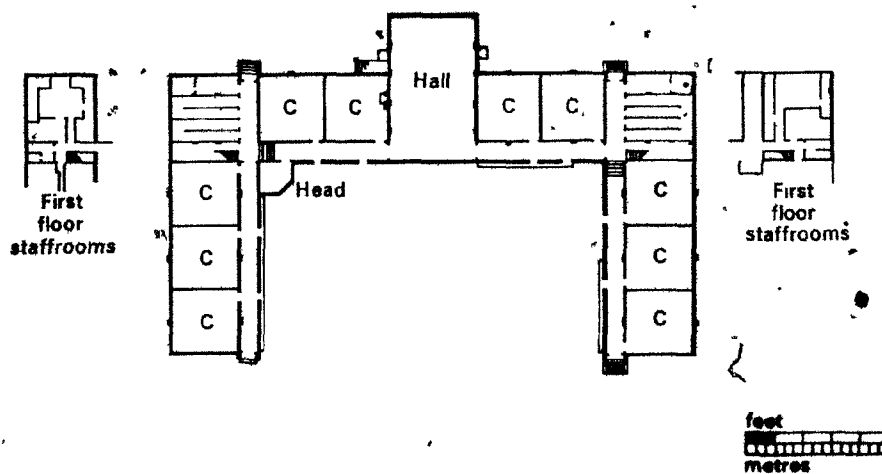
(Source: Schmidt 1967)



U.S. model No.1, one-teacher school house, United States Bureau of Education. (Source: LaChance 1919)



Senior Department, Walton Hall Avenue Elementary School,  
Liverpool, 1927.

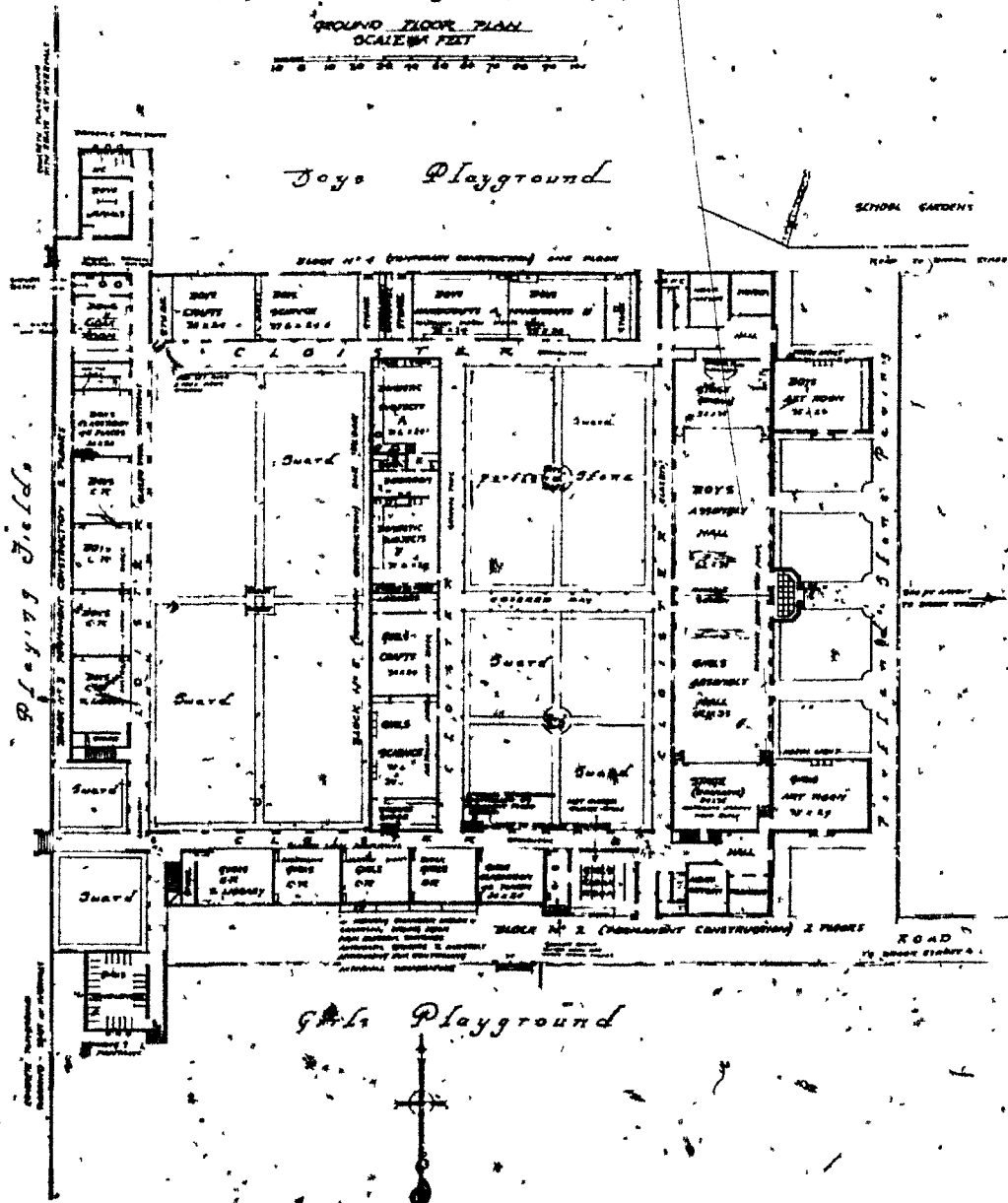


Badsley Moor Lane School, Rotherham, 1925.  
(Source: Seaborne-Lowe 1977)

## THE SCHOOL PLAN.

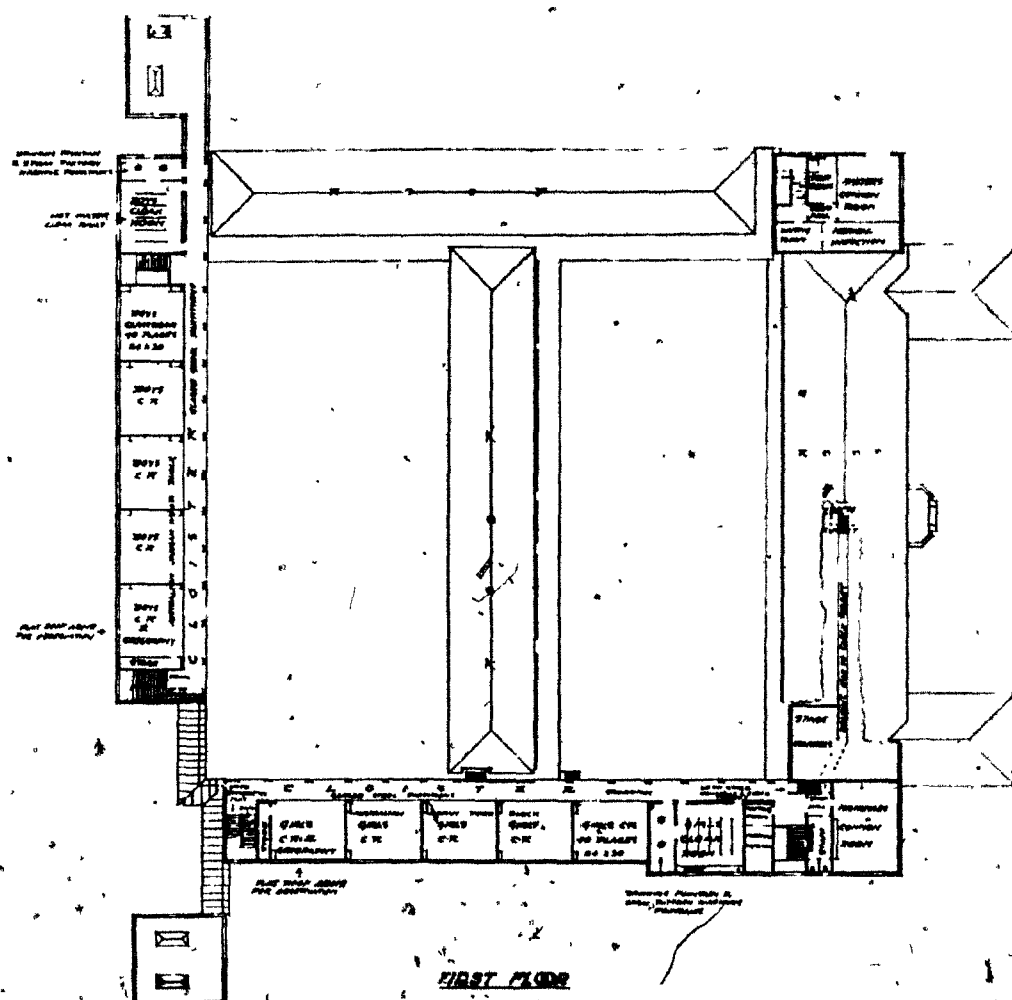
*Griff. U.D.C. Education Committee  
Northumberland Heath Central School*

**\* GROUND FLOOR PLAN**  
**SCALE IN FEET**



\* English school of the 1930s: Northumberland Central School, 1933. (Source: New Schools for Old 1933)





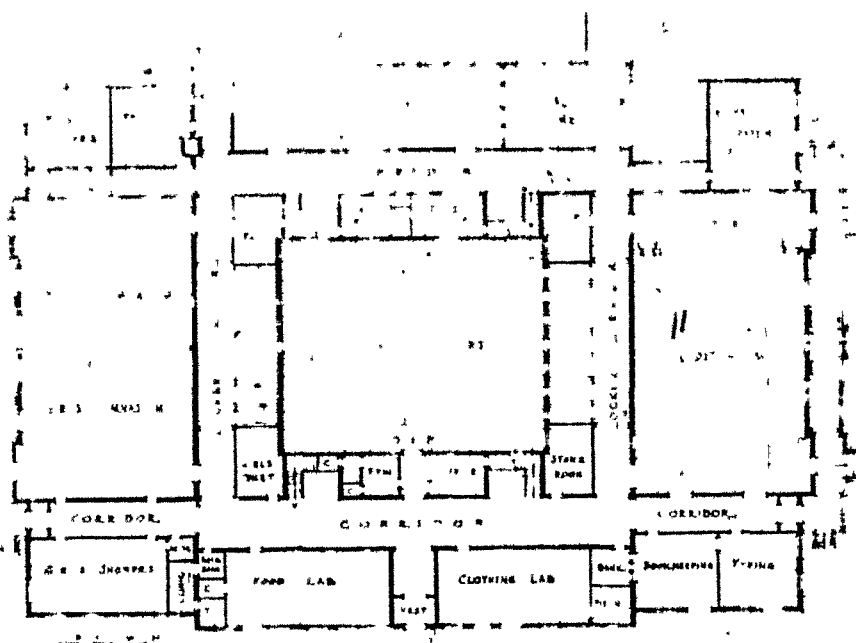
Northumberland Central School, 1933. (Source: New Schools for Old 1933)

Explanation to Plate V/10

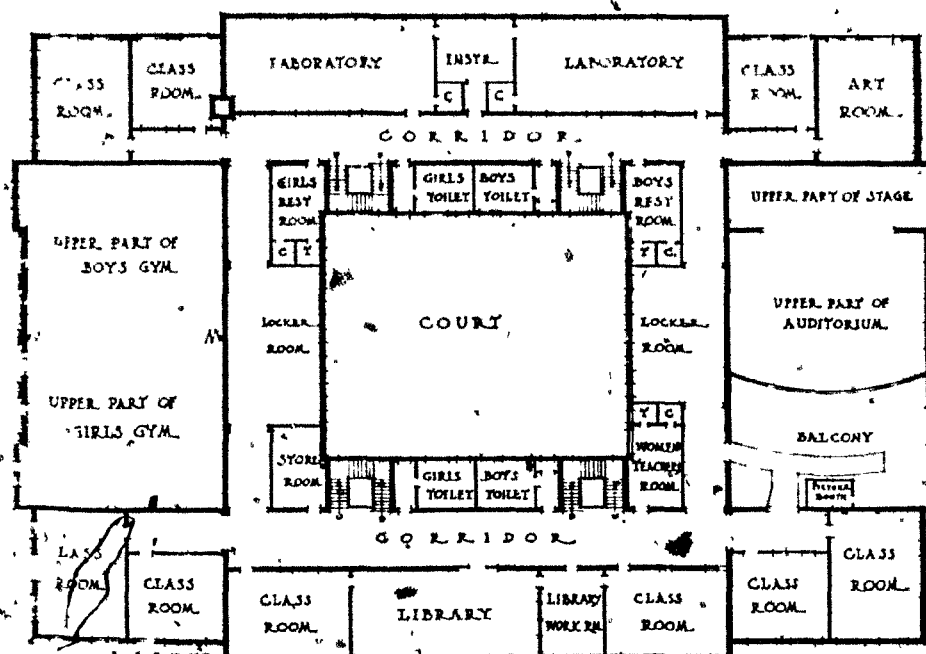
American schools in the 1930s. From top to bottom: Columbia High School, Columbia, Miss.; Hollywood High School, Los Angeles, Cal.; School at Nothville, Mich.

(Source: Perkins-Cocking 1949)

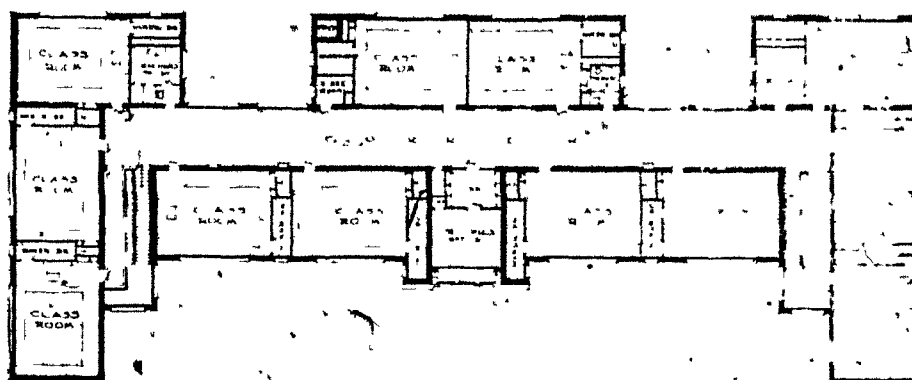
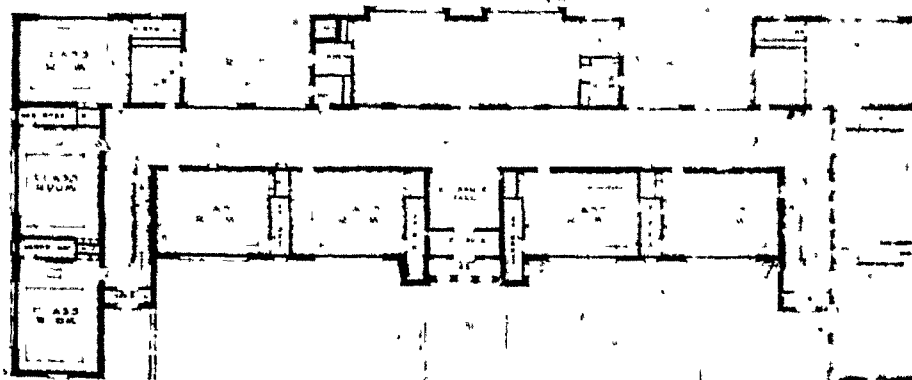
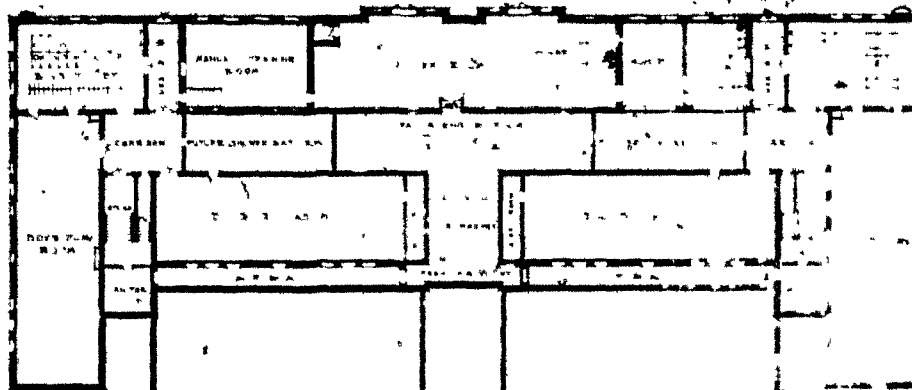




First floor Plan

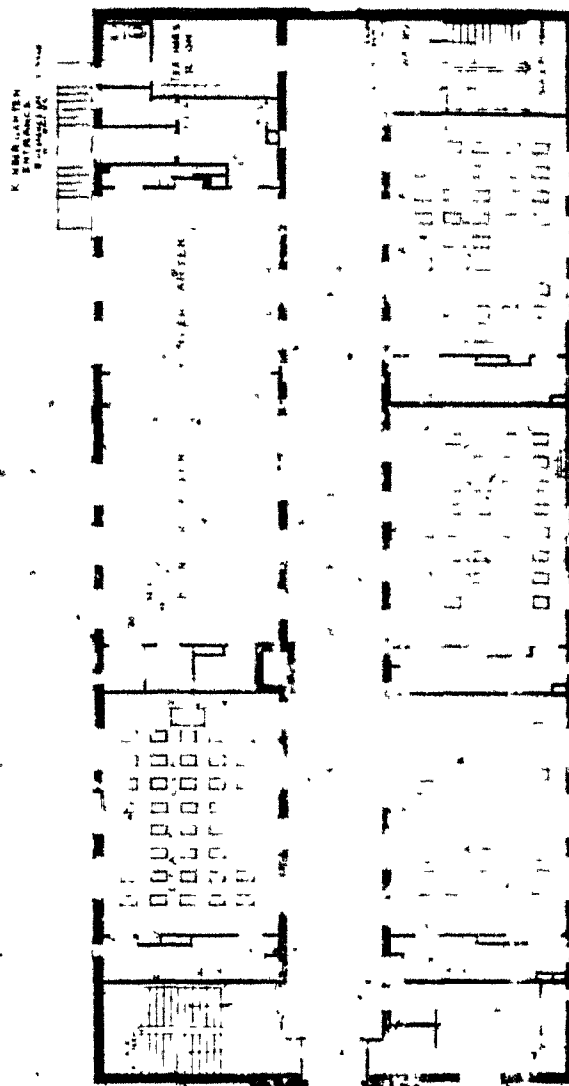


New Junior High School, Jacksonville, Fl. (Source: Study  
1925)



Second Floor Plan

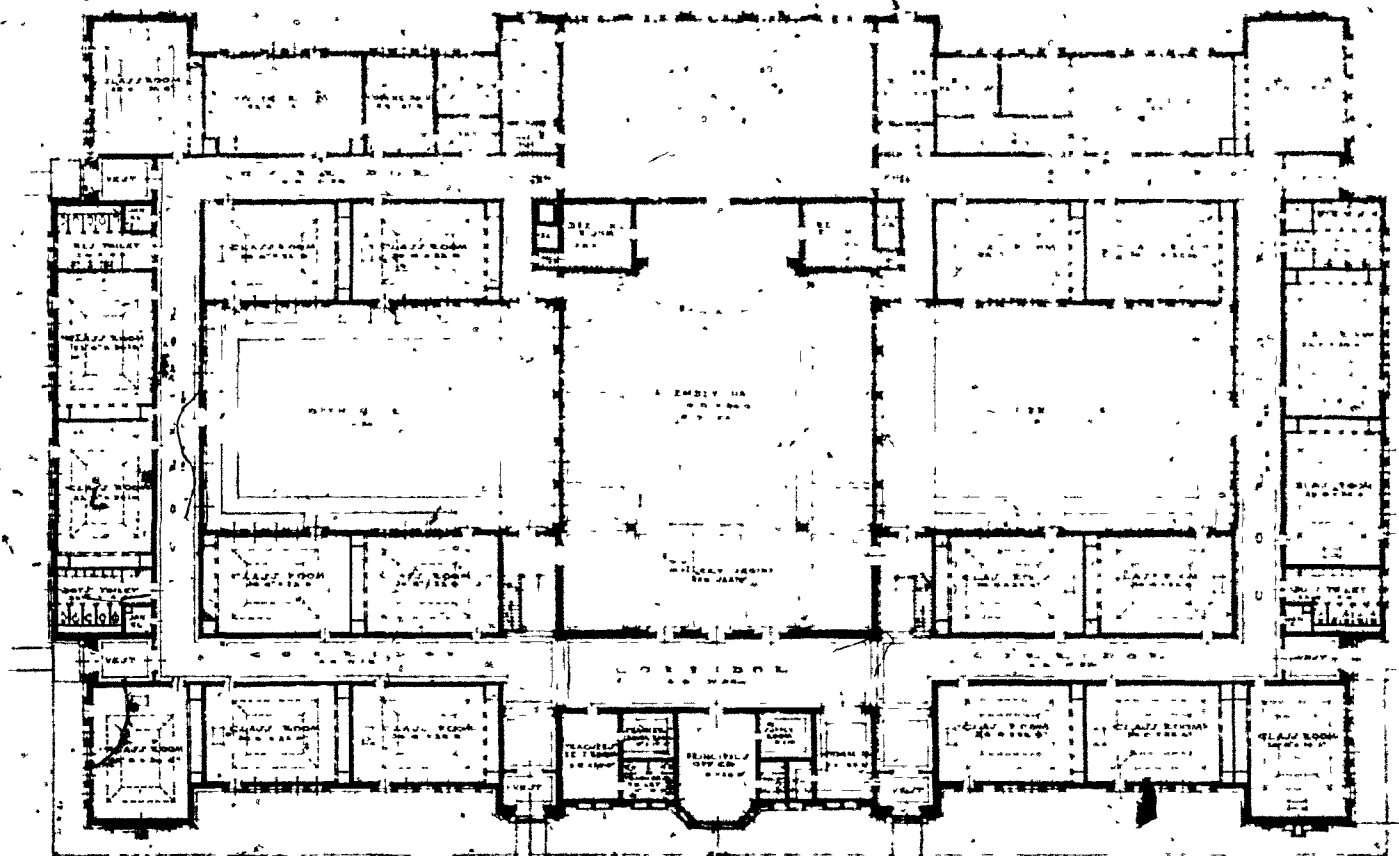
William Clark School, St. Louis, Miss. (Source: Study 1925)



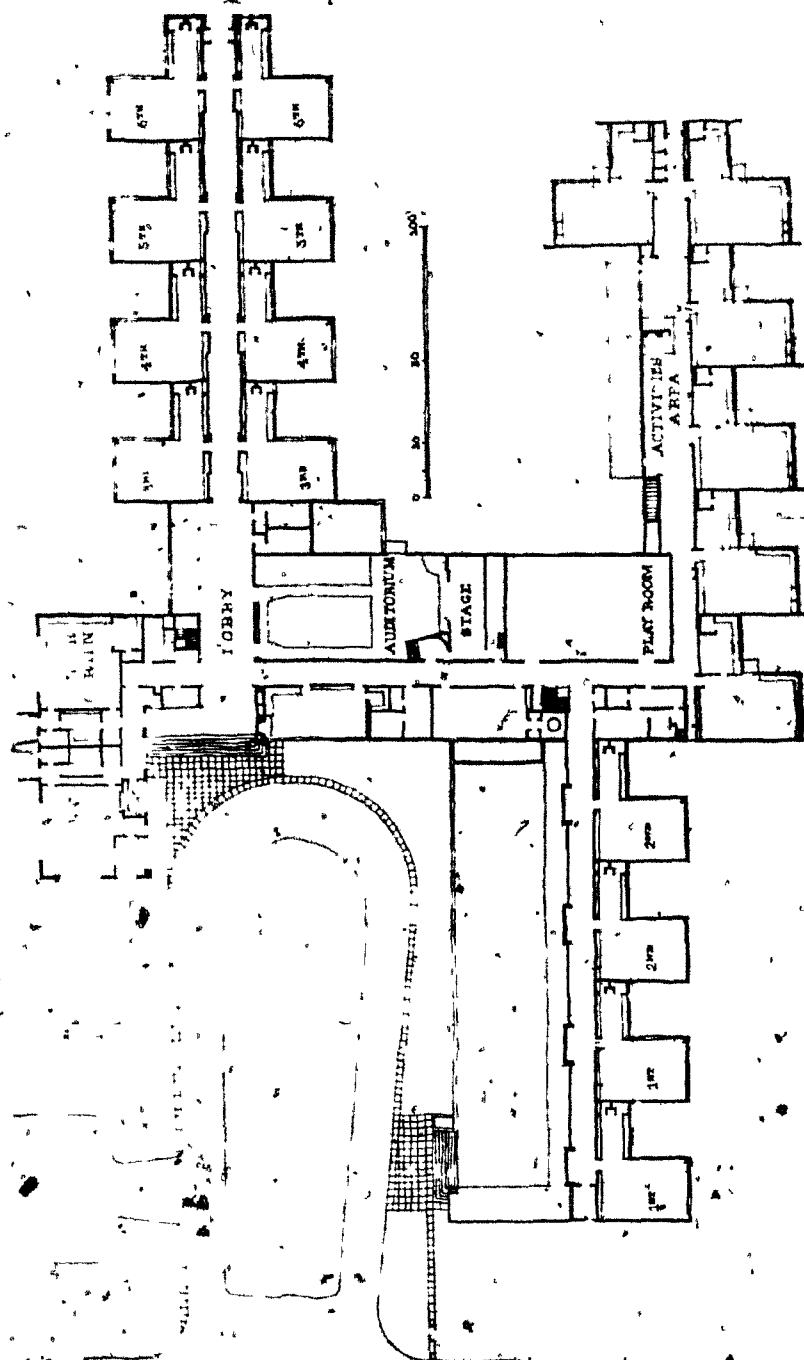
Ground floor plan, Kensington School, Great Neck, L.I. (Source: Eberlein 1922)

plate V/13

POOR COPY  
COPIE DE QUALITEE INFERIEURE



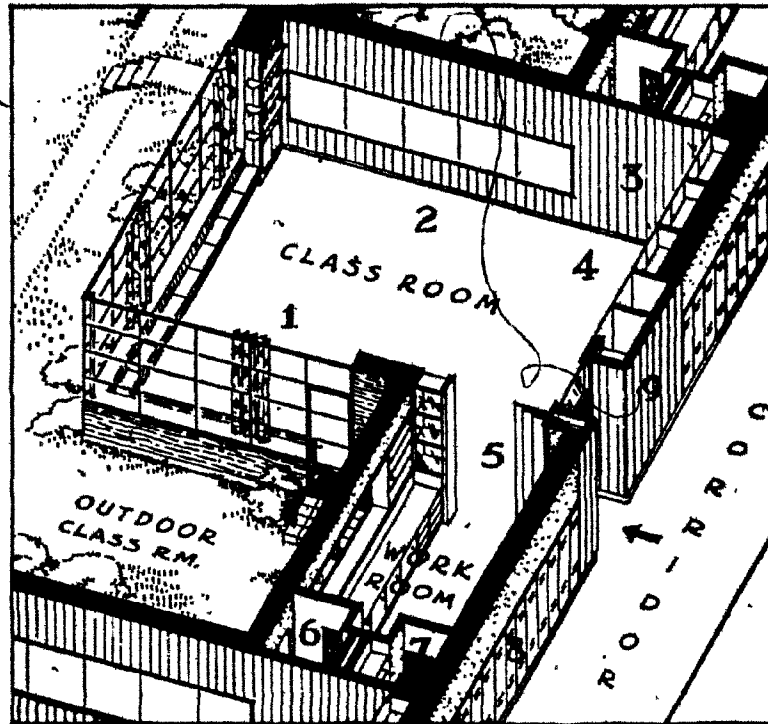
Main floor plan, Skokie School, Winnetka, Ill. (Source: Perkins-Taylor 1924)



Crow Island School, Winnetka, Ill. (Source: Crow Island Revisited 1955)

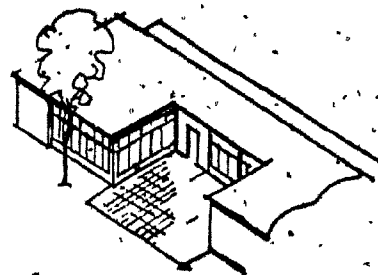
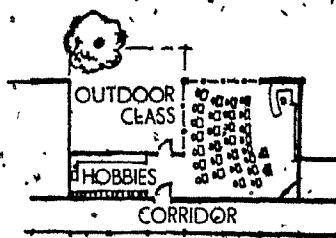
plate V/15



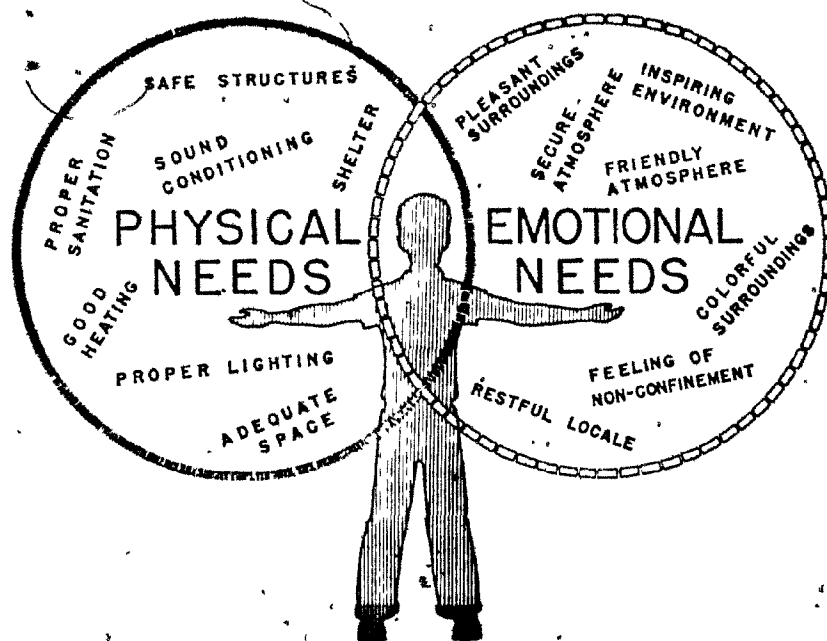


- |                           |                             |
|---------------------------|-----------------------------|
| 1—Story corner            | 5—Sliding doors to workroom |
| 2—Desks                   | 6—Toilet                    |
| 3—Wood tack board         | 7—Closet                    |
| 4—Group project area      | 8—Corridor lockers          |
| 9—Corridor bulletin board |                             |

The ideal classroom. (Source: Washburne 1940)

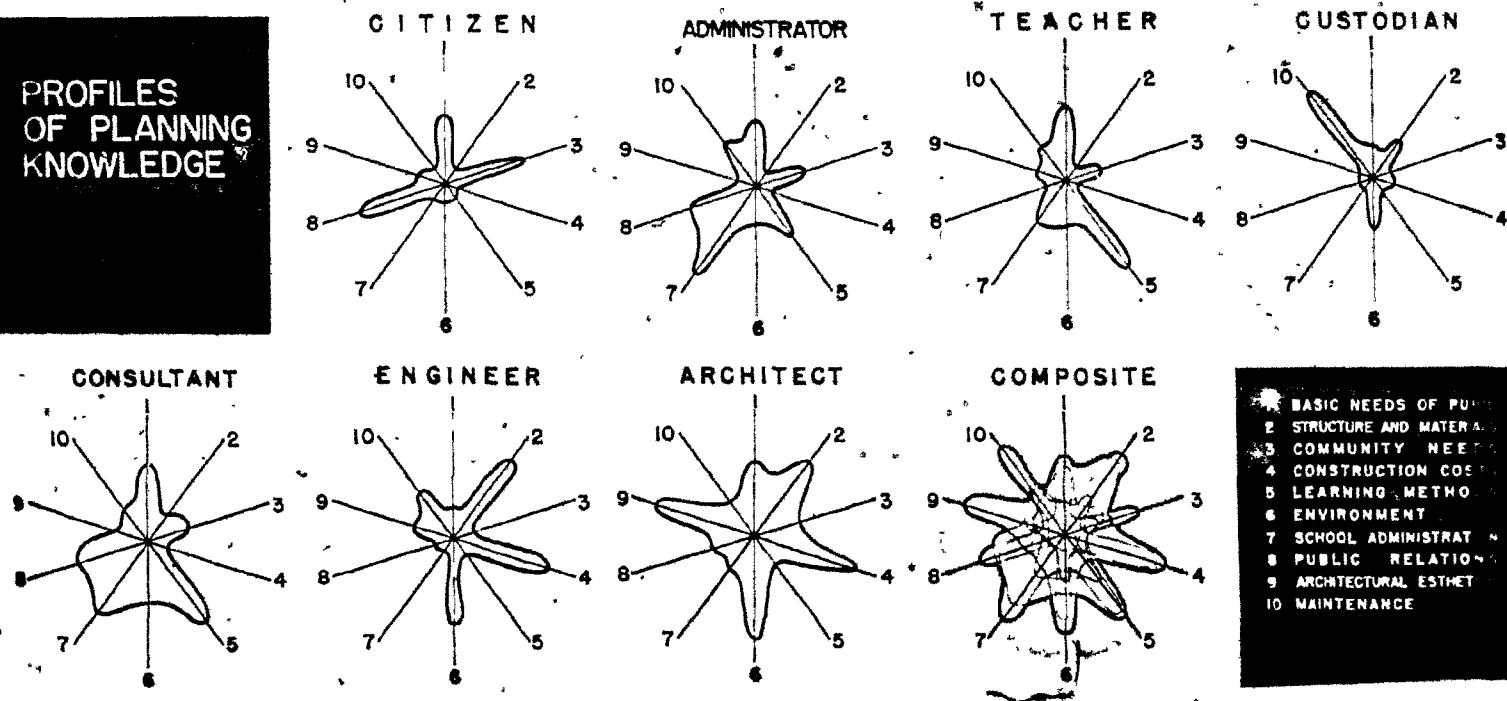


The Neutra plan. (Source: Stillman-Castle, clearv 1949)



Needs of pupils. (Source: Caudill 1954)

# PROFILES OF PLANNING KNOWLEDGE

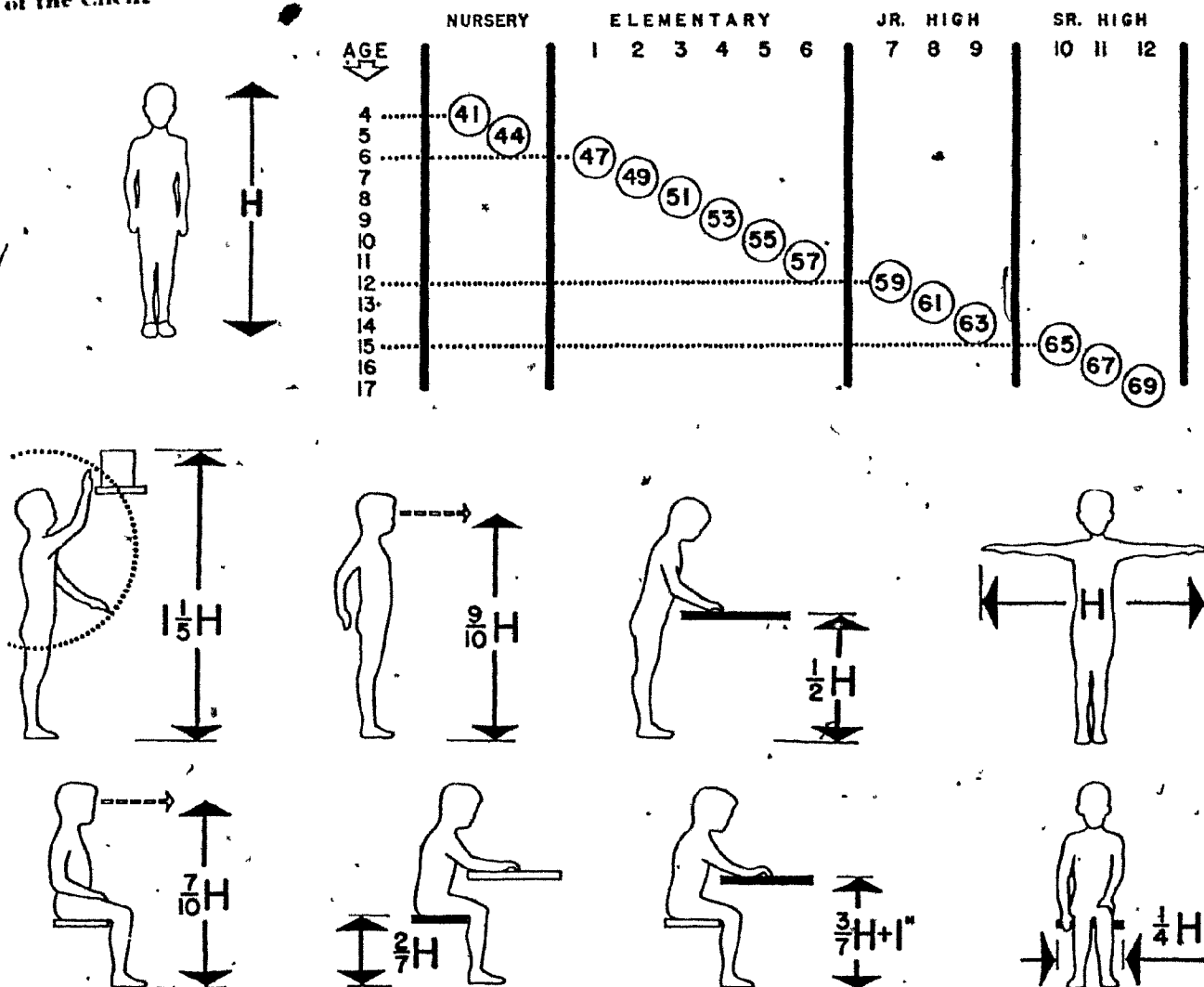


- 1 BASIC NEEDS OF PUBLIC
- 2 STRUCTURE AND MATERIALS
- 3 COMMUNITY NEEDS
- 4 CONSTRUCTION COSTS
- 5 LEARNING METHODS
- 6 ENVIRONMENT
- 7 SCHOOL ADMINISTRATION
- 8 PUBLIC RELATIONS
- 9 ARCHITECTURAL ESTHETICS
- 10 MAINTENANCE

(Source: Caudill 1954)

Plate V/18

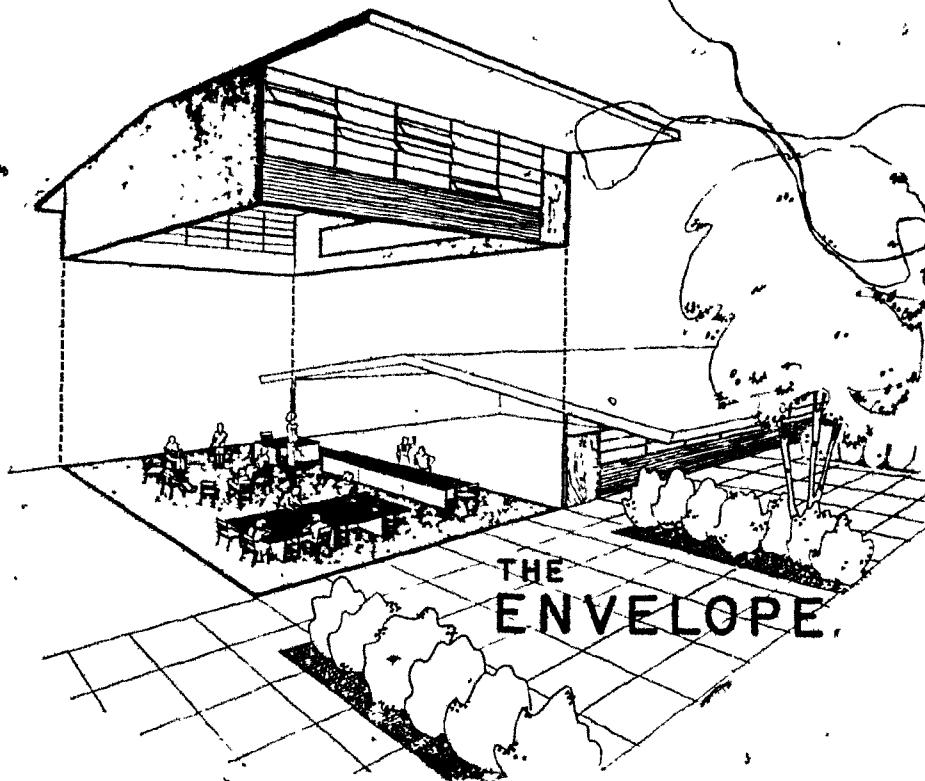
# The Physical Size of the Client



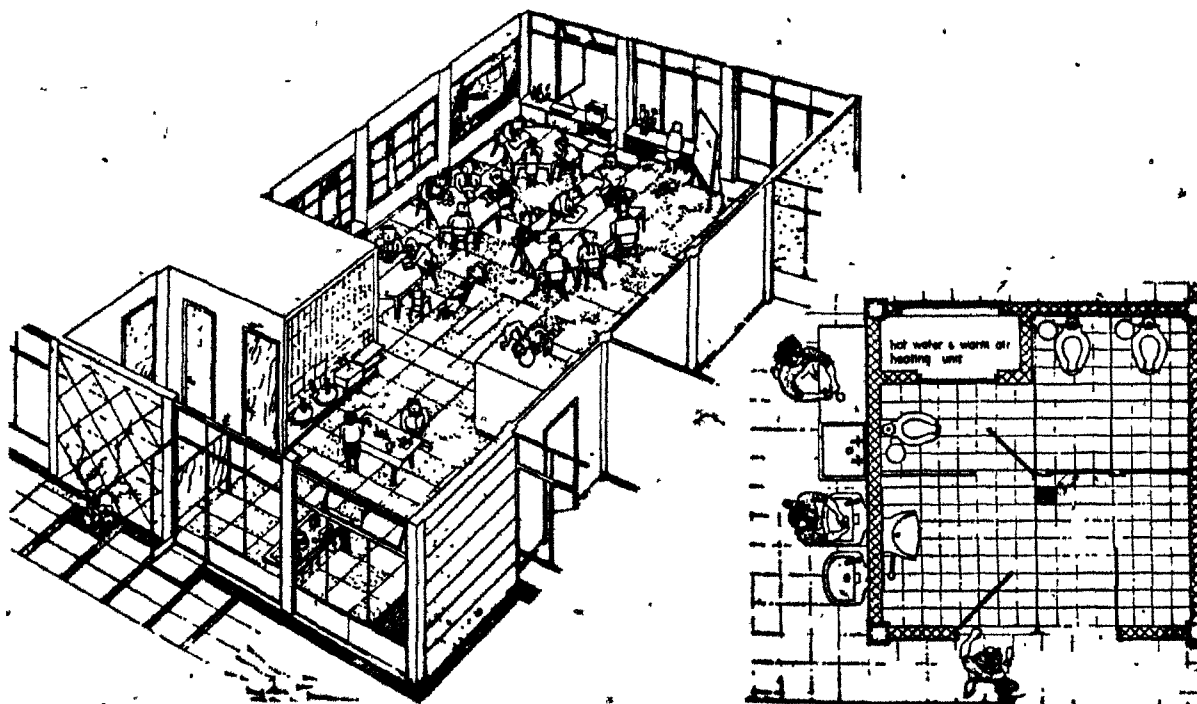
Schools are built for the pupil. If shelves are too high to reach, seats too small to sit in with comfort, or spaces too small for individuals or groups of pupils to work in, then the school cannot function properly. These are some characteristics of the anatomy of the pupil.

based on statistics prepared by the U. S. Department of Agriculture. The pupil is the yardstick, a varying measurement from one age group to another. These diagrams are based on "H", the average height in inches indicated in circles for each age or corresponding grade.

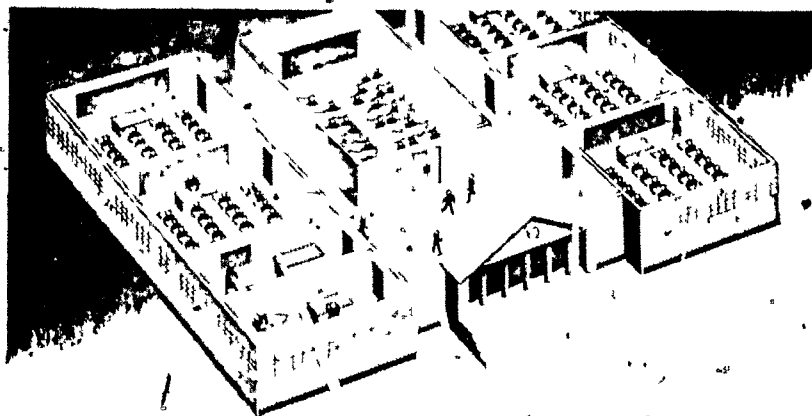
Converting the 'self' into individual - statistics in education. (Source: Caudill 1954)



American envelope. (Source: Caudill 1954)



Self-contained classroom, Hertfordshire County Council programme, 1951. (Source: Godfrey-Castle Cleary 1953)



## Educators hail new simplified school intercom!

**More Efficient—Costs 50% Less  
than Complex Sound Systems!**



**Executone gives you instant voice-to-voice  
contact with every part of the school**

**Easier, more efficient administration** can be achieved with this modern *low cost* intercom system. Executone meets all essential communication needs of every school!

**Just push a button**—for instant two-way contact with every classroom... to quickly locate roving personnel... to make announcements.

**Teacher's privacy protected**—Principals can study teaching methods via Executone. An optional indicator lamp signals when the "line" to a class is open. Calls to principal's office are signalled by chime and light.

**Emergencies**—During fire, or air raid

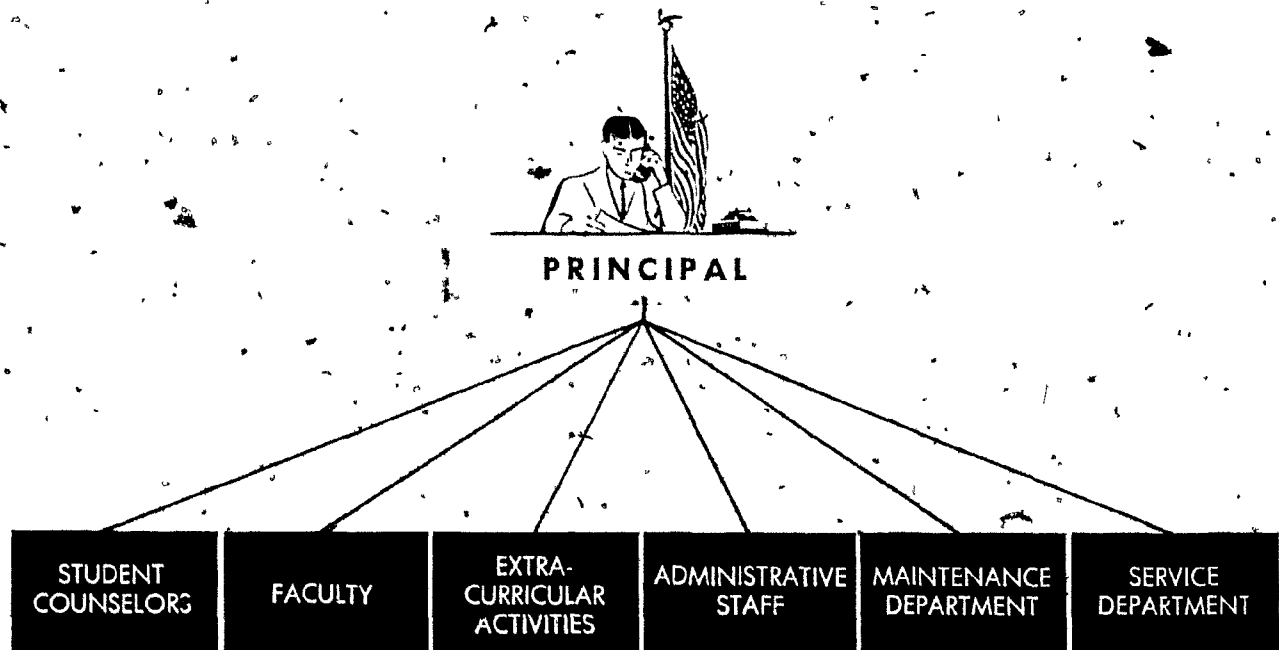
drills, Executone prevents confusion... quickly locates nurse or doctor... safeguards life and property.

**Easy to operate — dependable** — This simplified intercom system has no complicated control panels... no microphones... no headsets or telephone receivers.

**Easily installed** in existing and proposed schools. Large or small schools can expand their Executone with record turntables, radio tuners and public address speakers.

**A time clock** can be used in conjunction with Executone to automatically signal class periods.

(Source: The Nation's Schools, Vol. 54, No. 4, Oct. 1954)



## School-owned telephone system

GIVES INSTANT SCHOOL-WIDE CONTROL

You strengthen administrative control in every department of your school with a P-A-X Business Telephone System!

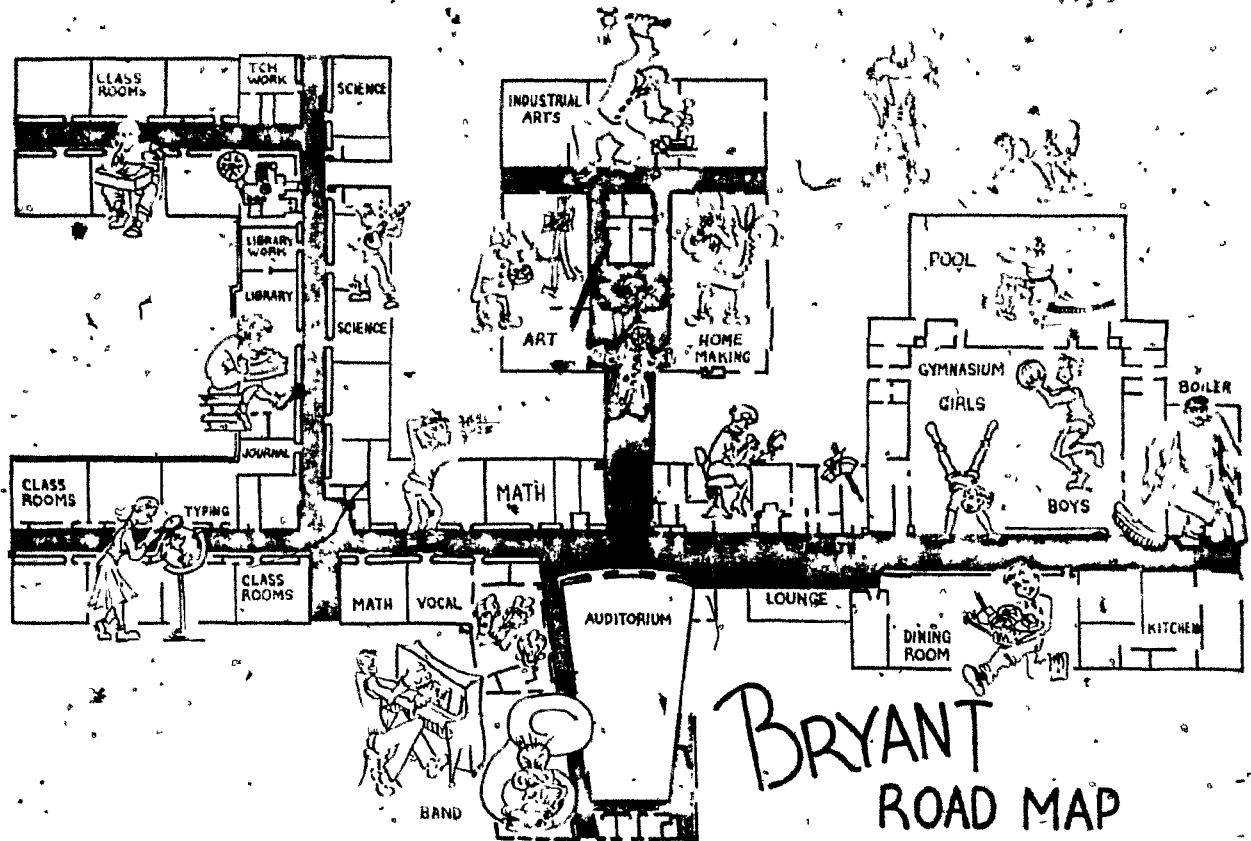
(Source: The Nation's Schools, Vol. 54, No. 4, Oct. 1954)

377

Junior High School, Dearborn, Mich., 1952.

(Source: Wilson-Bennett 1953)





# KEY TO UNIFIED ART DEPARTMENT

Display cases

Dropped floor—drain and so forth for ceramic and clay work

Clay sink

Puppet stage, viewed from multipurpose area

Folding partitions

Easel type of chalkboard

Movie screen for audio-visual instruction

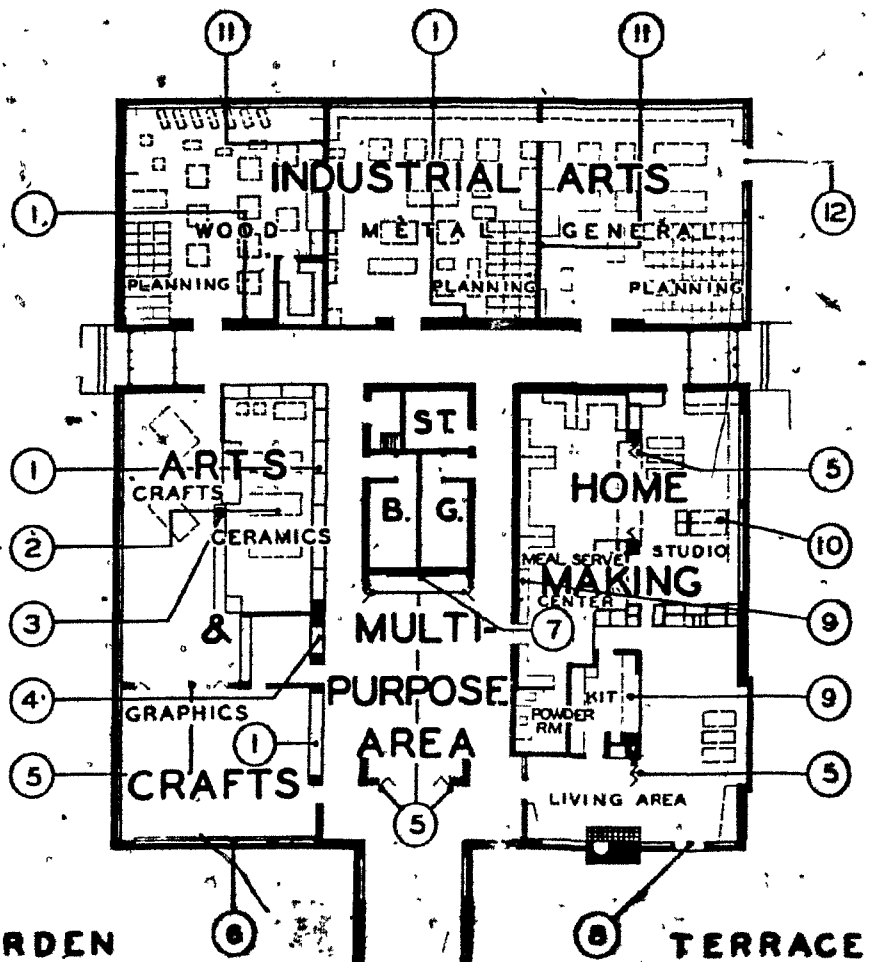
Double doors to patio

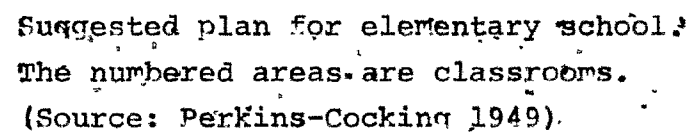
Food serving counters

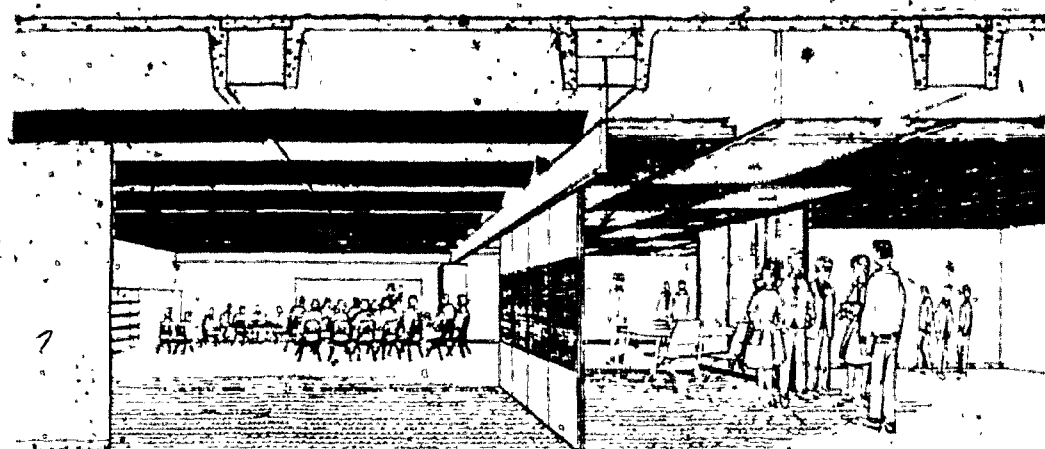
Under-counter sewing machine storage

Removable partitions

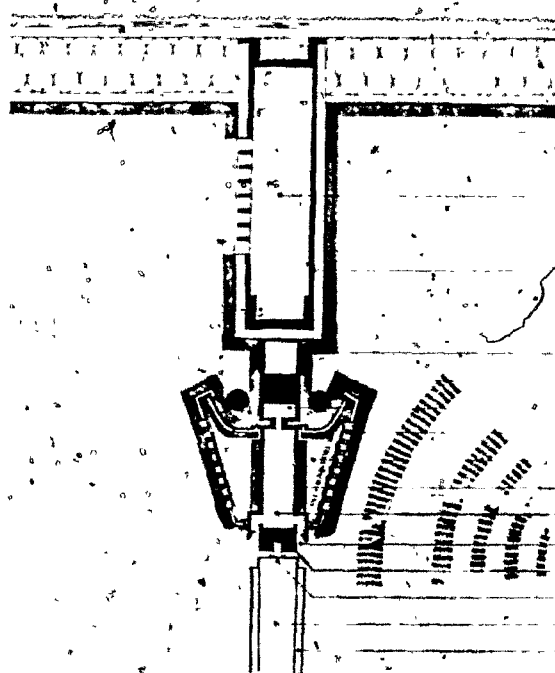
Service and receiving door







The Enviro Construction System



### THE SERVICE SANDWICH

ROOF PANEL

REFLECTIVE SURFACE

AIR RETURN DUCT

STEEL "U" DUCT

HIGH VOLTAGE RACEWAY

LUMINAIRES

BALLAST

PLASTIC LIGHT DIFFUSER

ACOUSTICAL RESONANCE CHAMBER

ACOUSTICAL ABSORBER

AIR SUPPLY DUCT

AIR DIFFUSER

LOW VOLTAGE RACEWAY

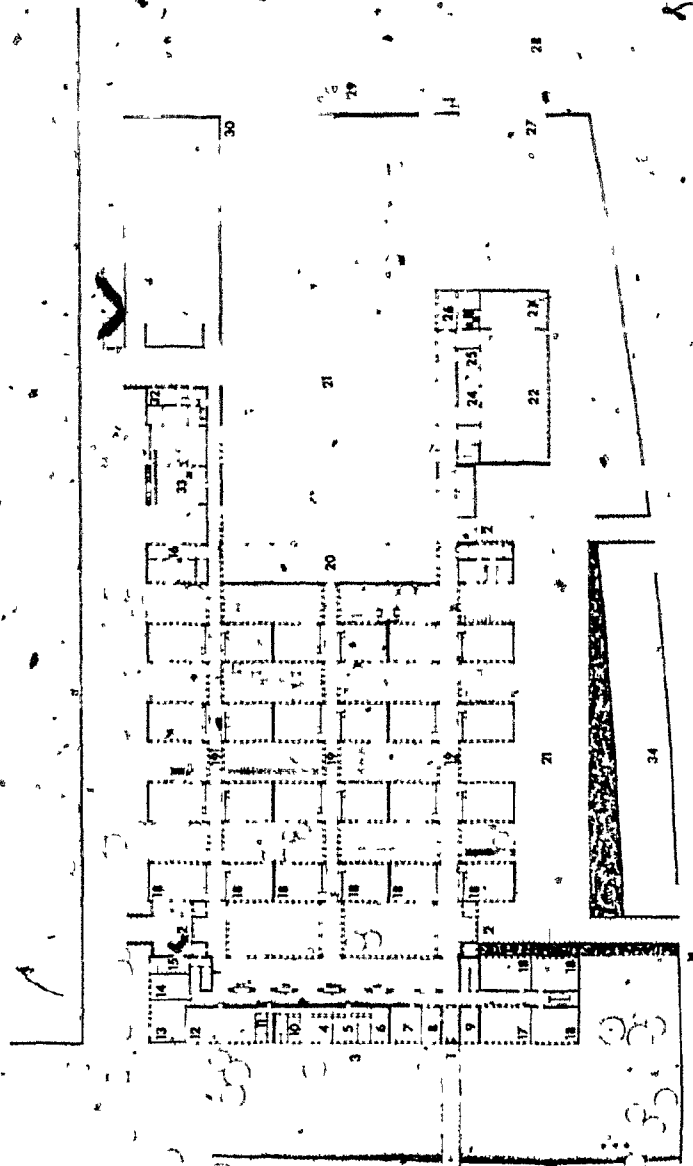
PARTITION ATTACHMENT

INTERIOR PARTITION

DETACHABLE SURFACE

Service Sandwich. All coordinated functions of the CLASS system are contained in the three-foot-deep "service sandwich."

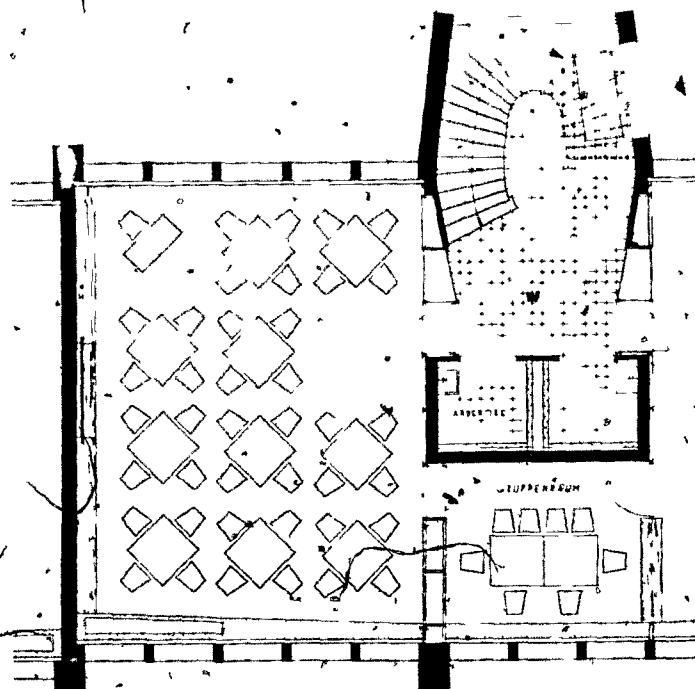
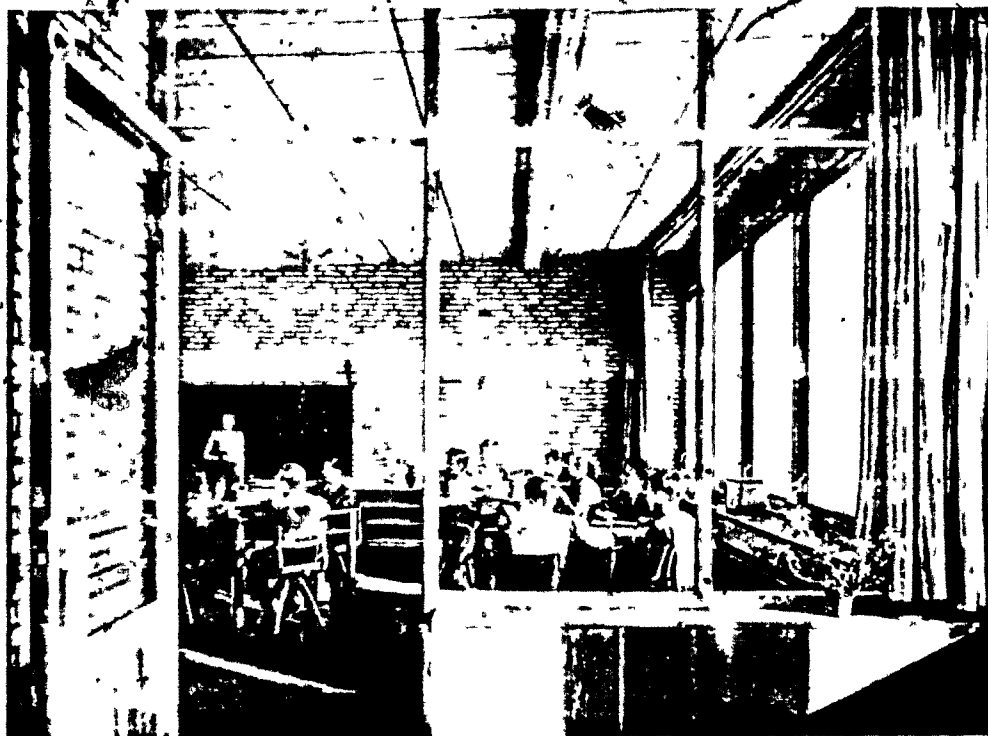
The Enviro Construction and the CLASS system.  
(Source: Boice n.d.)



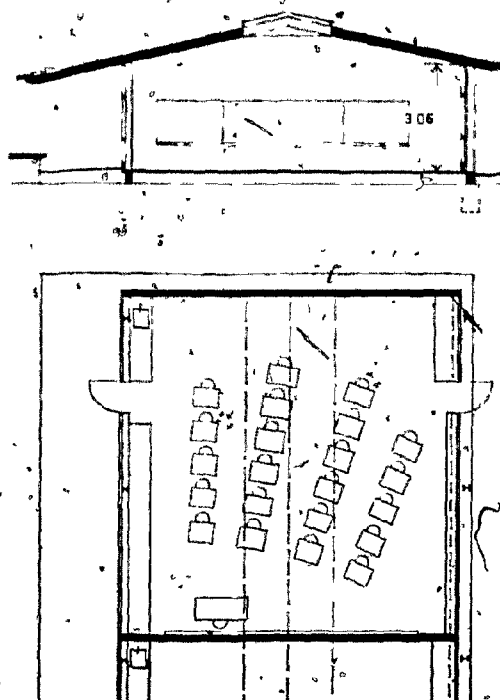
SÜDANSICHT DER SCHULE • SOUTH ELEVATION

Ground plan and elevation, Georg-Rüchner-Schule, Narmstadt, (Source: Otto [1963]  
1966)

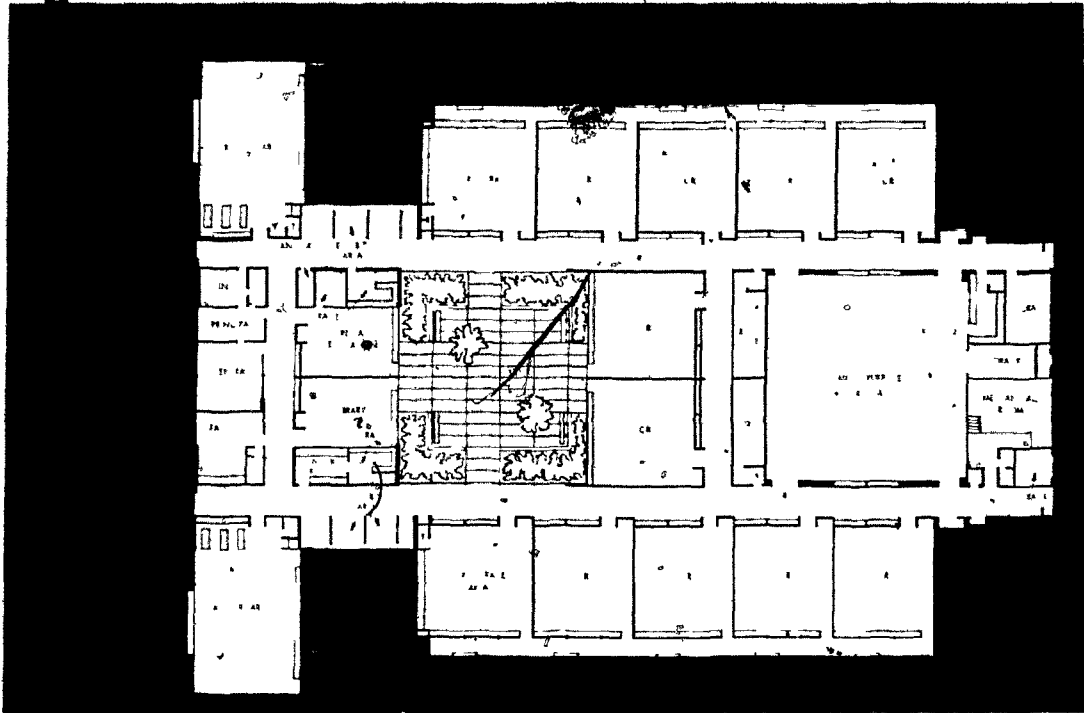
Plate VI 12



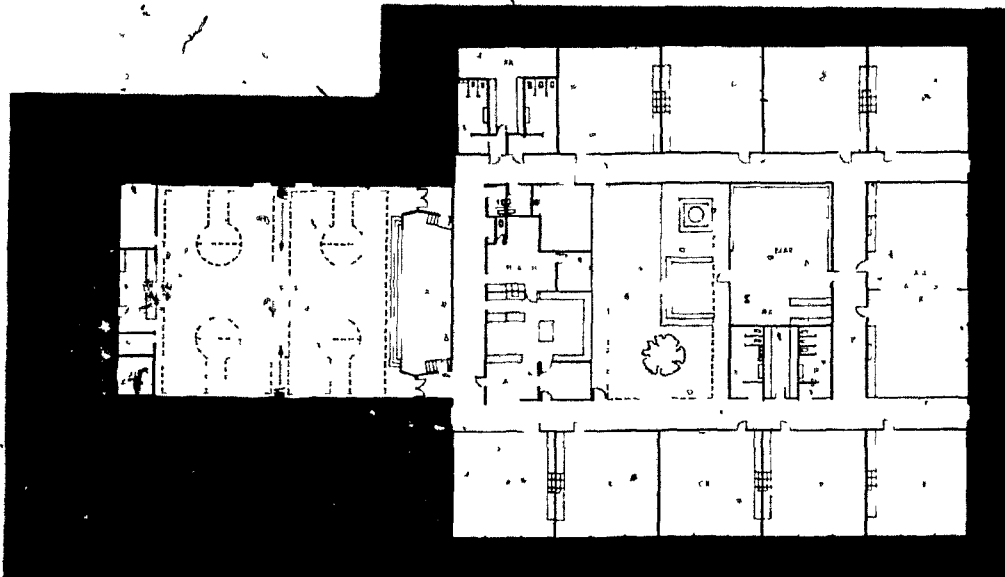
Plan of classroom and view from the group room (Gruppenraum)  
(Source: Otto [1963] 1966).



Classroom and cross-section, North Hillsborough School,  
England. (Source: Roth 1966)



Kempton School, Saginaw, Mich., 1965.



Firgrove Elementary School, Puyallup, Wash., 1965.

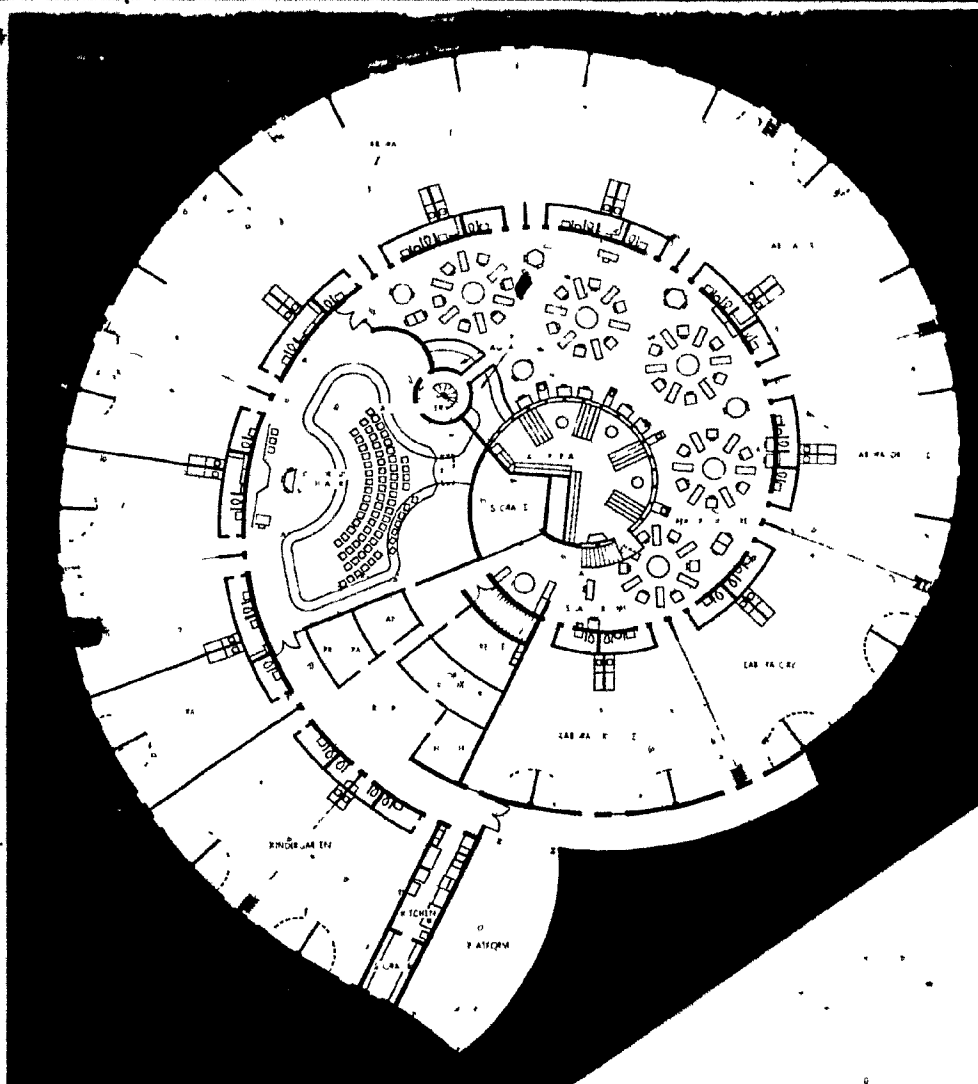
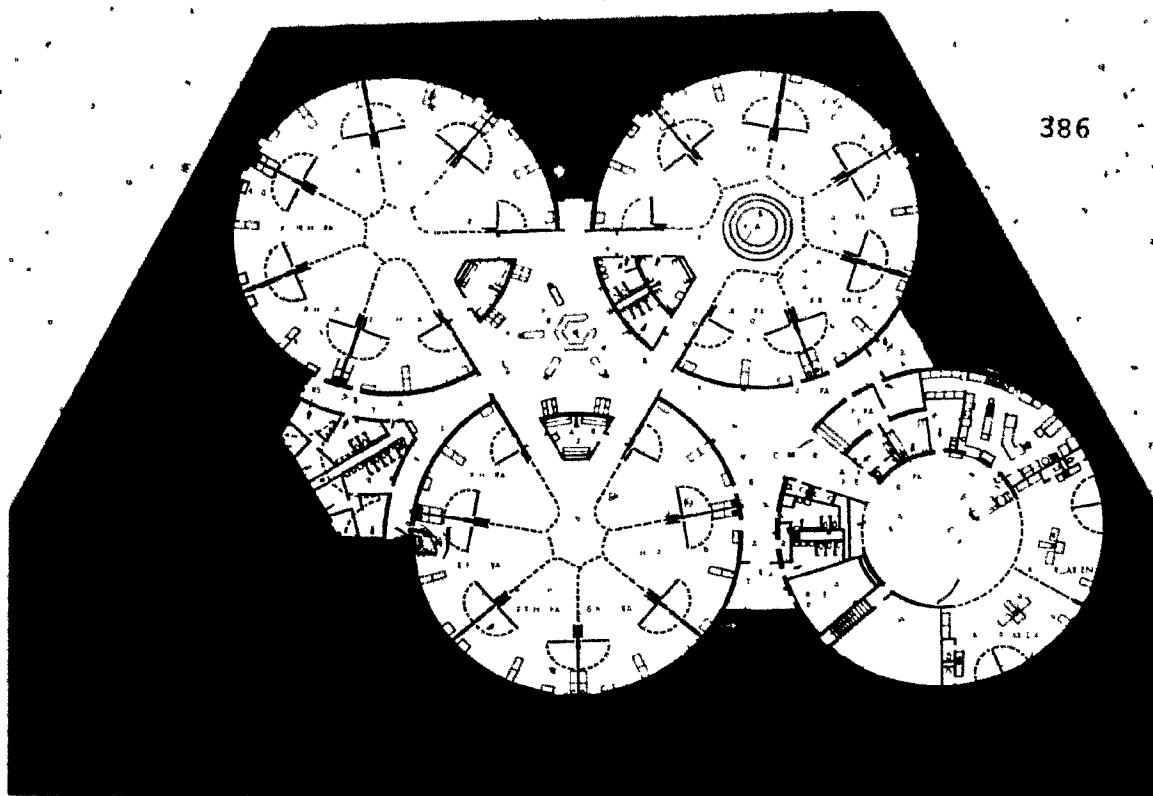
(Source: How Award Winning Schools Compare 1965)

Top: Sherwood School, Greeley, Colo., 1965..

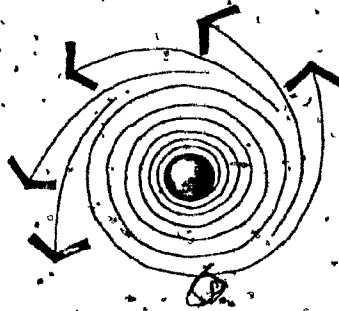
Bottom: Valley Winds School, Miss., 1965.

(Source: "How Award Winning Schools Compare" 1965)



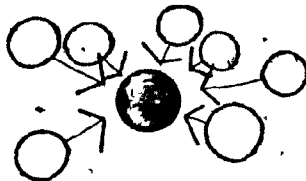


education  
is  
dynamic

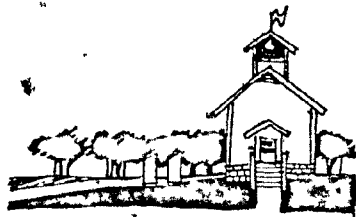


First, education, if it is to do its job effectively, must relate to the needs of the broad society that it serves. More than ever before, present-day society is dynamic, in a state of rapidly escalating change. If society changes, so must education—in content, method, and concept. Education is dynamic.

facilities  
are shaped  
by program

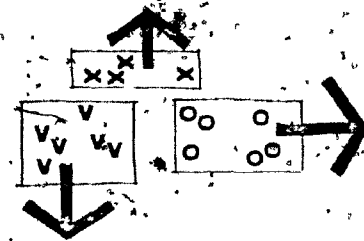


Next, educational facilities exist primarily for the purpose of serving the educational programs they house. If they are worth their salt, facilities must accommodate the educational program.



buildings are used  
many years

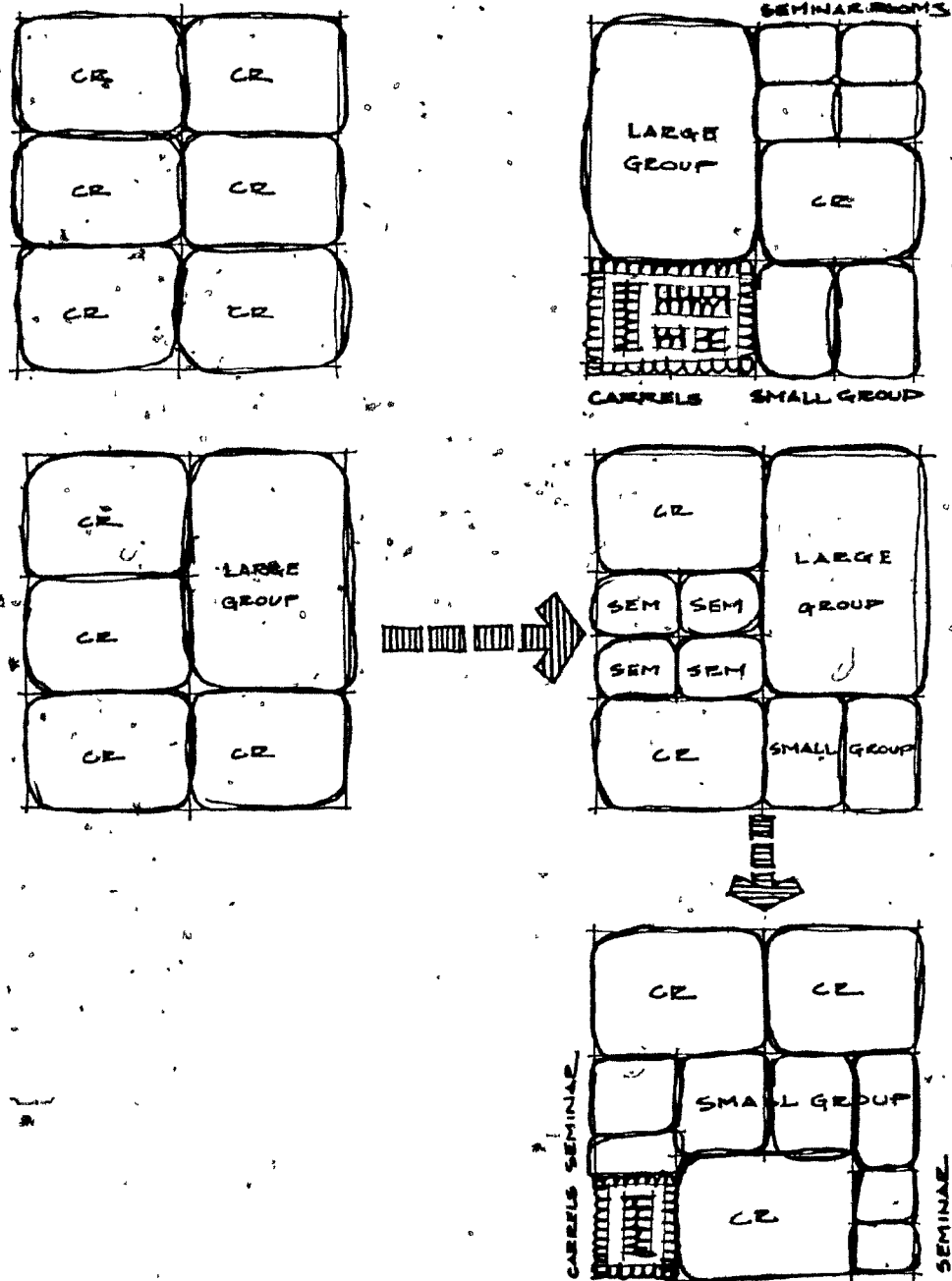
Schoolhouses, though, must serve for many years. This is an economic fact of life. Unlike the paperback book which can easily be discarded after a relatively short time, "throwaway" schools have not yet been invented.



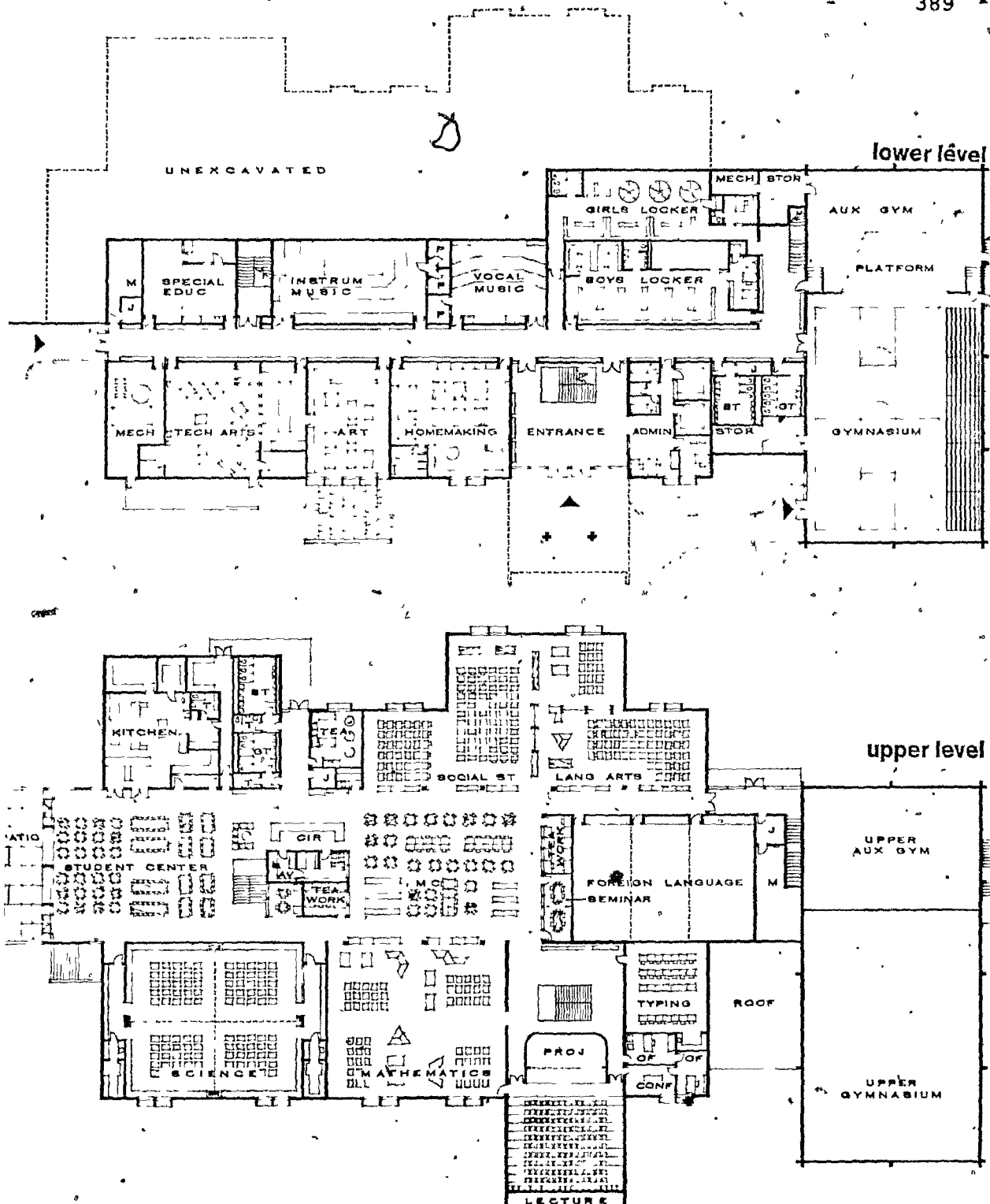
buildings must be  
capable of change

Most school buildings are destined to either serve or limit educational programs for 50 to 100 years. The dilemma then is how to make buildings, which are long-term commitments in steel and brick, and dollars and cents, serve ever-changing educational programs. The solution is obvious. Buildings must be capable of change. They must be as dynamic as education is.

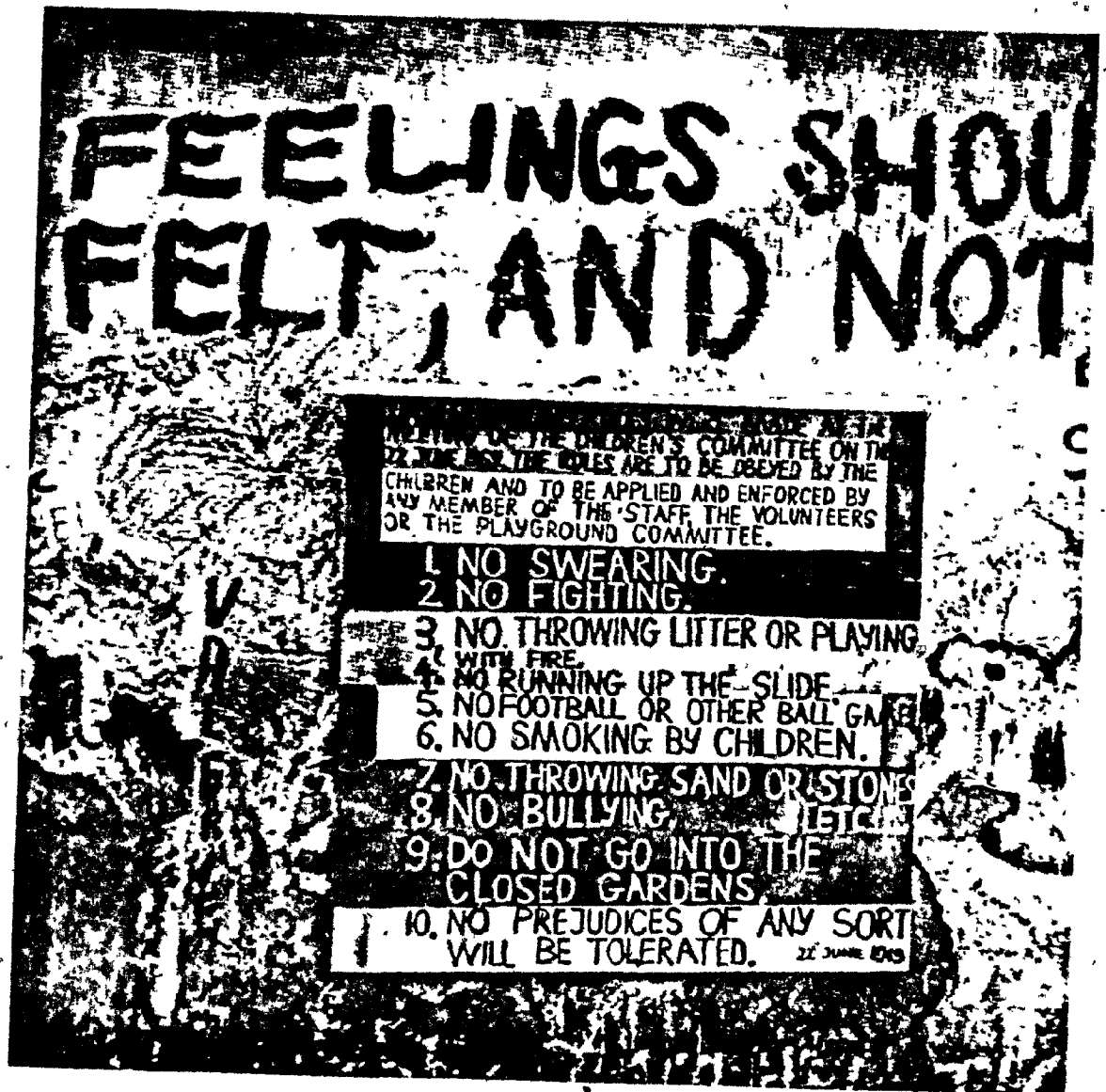
The ideology of flexibility. (Source: Open Space Schools 1971)



Examples of changing use of space in the evolution of departments. (Source: Boice n.d.)



Evergreen Junior High, Jefferson, Col. (Source: Oregon Space Schools 1971)



Playground rules by children (?). (Source: Utzinger 1970)

### A note on Bentham's Principle of Utility

The pivoting point of the utilitarian philosophy was the principle of utility or, as it has been called later, the 'greatest happiness principle'. Bentham in his Introduction to the Principles of Morals and Legislation, wrote:

Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. It is for them alone to point out what we ought to do, as well as to determine what shall we do. On the one hand the standard of right and wrong, on the other the chain of causes and effects, are fastened to their throne. They govern us, in all we do, in all we say, in all we think... (J. Bentham An Introduction to the Principles of Morals and Legislation. London: The Athlone Press, [1780] 1970:11)

Thus the rightness or wrongness of an action was determined by its contributions to the happiness of everyone affected by it. Happiness was conceived as being the lack of pain or a sum of pleasures. Utilitarianism was based on these two principles: the consequentialist principle and the hedonist principle. The concept of utility and happiness was described in these terms too:

By the principle of utility is meant that principle which approves or disapproves of every action whatsoever, according to the tendency which it appears to have to augment or diminish the happiness of the party whose interest is in question... (J. Bentham [1780] 1970:11-12)

For further specification Bentham developed a hedonic calculus to measure the magnitude of pain or pleasure. In order to determine the amount of these feelings and consequently

judge upon the morality of the preceding action. One must consider the intensity, duration, certainty (of pain or pleasure actually taking place), propinquity (its distance from the time of calculation), fecundity (the chance it has of being followed by sensations of the same kind) and purity (the chance it has of not being followed by sensations of the opposite kind). According to Bentham it is the business of government to promote the 'calculated' happiness of the society by punishing and rewarding, and creating an "artificial harmony of interests".

(For further details see: Quinton, A. Utilitarian Ethics. London: The Macmillan Press Ltd., 1973.)