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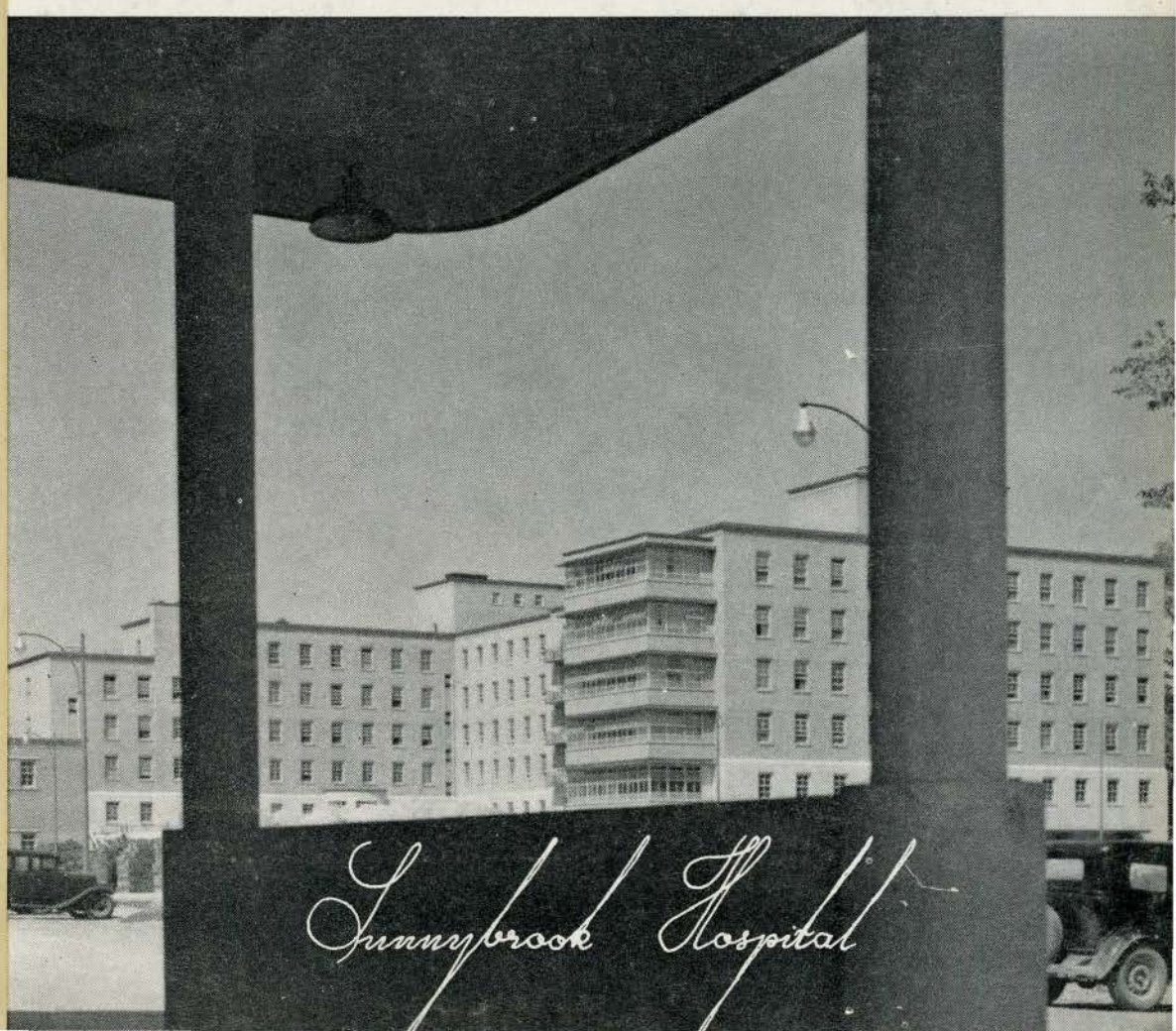

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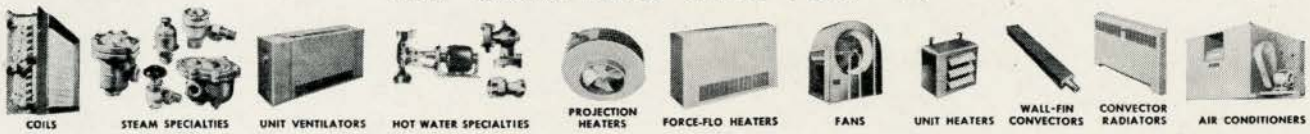
THE COMPLETE LINE FOR '49



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JOURNAL

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

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PRESIDENT . . . . . A. J. HAZELGROVE (F)

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R. A. I. C.
OCTOBER 1949

TO US in the Department of Veterans' Affairs, Sunnybrook Hospital has a peculiar significance. To us it is not only a fine treatment centre, and not only one of the most modern hospitals of its kind any place in the world. It is concrete evidence that the people of Canada have kept faith with those who served, and who made a physical sacrifice because of their service.

I WAS NOT the Minister of the Department of Veterans' Affairs at the time this hospital was envisaged, but I know the aims and objectives at the time that the architects first began to prepare preliminary sketches. We knew that the price of war was not cheap. We knew the cost was measured not alone in dollars and cents, and that the bill for war in terms of broken bodies, and in terms of physical illnesses is a heavy one.

WHEN Sunnybrook Hospital was planned there were certain things which had to be kept in mind. First was the fact that enlistments from the area to be served by the new hospital had been heavy. This meant a large hospital would be necessary. There was next the fact that our Canadian troops were fighting in every corner of the world. The Navy was on the high seas everywhere. Canadians were in aircraft in the skies wherever operational aircraft flew. The Army was in Hong Kong, through the African desert, in Sicily and up through Italy as well as in the battlefields of France, Holland and Belgium. These far flung forces of Canadians indicated to our medical staffs that we would be called on to treat conditions not commonly found in Canada, and so every modern facility for research and treatment became a necessity.

WE knew, too, that the modern concept of hospitals calls for a structure that has beauty of design, and that rural surroundings can have a beneficial effect upon morale. But in seeking a rural area it was important that there be comparatively easy access for relatives, and the busy surgeons and medical men so important to high standards of treatment. The Sunnybrook Hospital site offered exactly those things, while the architecture, functional in every way and modern to the ultimate degree, still provided the beautiful lines and the imposing appearance which Departmental officials felt so essential.

THE construction of a hospital, such as Sunnybrook, is not a simple thing. In a magazine serving the profession of architecture I, of course, need not emphasize that it is a long journey from the plans on the architect's draughting board to the finished structure. I need not emphasize that the road from first sketches to finished buildings is a road of "blood, sweat and tears". In the Department of Veterans' Affairs we learned that. We were faced with the war-time scarcity of materials. Government priority produced some of the materials, but in many cases we had the same difficulties, and the same problems, as the private builder. We learned that more than materials were in short supply — that competent tradesmen were a commodity of very real value. We knew at first hand, from our own experience, the difficulties contractors and architects were meeting right across the country. But Sunnybrook Hospital continued to advance — not always as rapidly as we would have wished, but each day saw us a little nearer to conclusion, and when the structure was finished it was a building of which Canadians might well be proud. At that the delays were not too serious for it was during the summer of 1944 that preliminary grading was started, and the first contracts were let, and in September, two years later, the first patients were admitted.

IT would not be fitting for me to touch on construction methods which were employed, or to elaborate on the architectural styles. Those fields are better left to the contractors and to the architects, but Sunnybrook does have features which do not come into either field. It is true that the total area of the hospital grounds is three hundred and eighty acres. It is true that it is the largest of thirty-three healing institutions operated by the Department of Veterans' Affairs, and that it can accommodate a total of 1,450 patients quite comfortably. In an article of this kind I might point out that it took five-and-a-half-million bricks to construct the various buildings. I might point to the fact that there are 3,750 doors and 3,000 windows; that there are 80 acres of plaster and 4,500 tons of cut stone in the various buildings. Architects and others might be interested in the fact that the heating and plumbing piping, if laid end to end would reach for 125 miles, and that there are 8,500 lighting fixtures in the hospital with 27,530 square feet of steel windows.

HOWEVER, these figures, impressive though they are, do not tell the story of Sunnybrook Hospital. To fulfill its purpose a hospital must be a thing of more than bricks, more than copper piping, more than doors and windows. It must be an institution with a soul and that soul can only come from the people connected with it. I feel that Sunnybrook Hospital is an institution with a soul. There is first of all that great-hearted group of doctors, many of them the outstanding men in their field, who are associated with us in this great work of healing. Every day they take time out from busy private practices to devote their time to Canada's veterans. There are the staff doctors, men of high professional standing who have made financial sacrifices to enter the field of public service.

THERE are the universities of the country who have given us such grand co-operation in making our hospitals teaching institutions. There are the nurses, too, many of them from the Army Medical Corps, who learned to know and to understand veterans in the battle areas of World War II. These are the people who are seen in any efficiently run hospital, but back of them is another large group, the orderlies, the dietitians, the cooks, the maintenance staff and those many others in various categories required for efficient operation. The architects and the contractors gave us a building. The people who staff it, and the patients there for treatment have given to the building a soul.

The Honourable Milton F. Gregg,
Minister of Veterans' Affairs.

SUNNYBROOK HOSPITAL, TORONTO

By E. P. MURPHY, C.M.G., LL.D.

Deputy Minister of Public Works

AS it is the responsibility of the Department of Public Works to provide accommodation of all kinds for the numerous Federal Government Departments throughout Canada, it followed, in the year 1943-44, that the Department of Veterans' Affairs approached the Department of Public Works with a view to providing architectural and construction services for the then proposed Veterans' Hospital Project in the Toronto area.

Although at the time the Department of Public Works had in hand an extensive programme of hospital building, required by the Department of Veterans' Affairs, the provision of a new Veterans' Hospital in Toronto was considered of the utmost urgency.

It was realized that the planning of so extensive a project required a survey and study of the newest and most up-to-date practice in hospital planning, and that the planning had to be related to the specific requirements of the Veterans' Affairs Administration and Treatment Services.

To meet the urgency of the programme, and to assure undivided attention to the work, it was decided to engage the services of architects in private practice, thus allowing the Department of Public Works staff to carry on with the hospital programme already in hand, and other works which were then in the planning stage.

The firm of Messrs. Allward & Gouinlock, architects, were commissioned for the work, and in co-operation with staffs of Christie Street Hospital and the Head Office of the Department of Veterans' Affairs, Medical Services, there was produced, in a very short time, a sketch study of the proposed hospital and its related service buildings. This original study of the entire project has been followed out with surprisingly few variations.

When the sketch plans were completed it became apparent that the project was of such magnitude that in order to prevent delay in supplying the urgently required hospital beds, it would be best to proceed with the construction of the project in stages, rather than to wait for the completion of the entire working plans.

The first unit to be tendered on was the Heating Plant, Kitchens, Service Buildings, and the Neuro-Psychiatric Building containing 150 beds. The Redfern Construction Company, Limited, of Toronto, were the successful tenderers on this first unit. From time to time, as plans and specifications for various units were completed, tenders were called and contracts let and the work put in hand. This firm of contractors were the successful tenderers on the succeeding contracts.

At this date, there only remains the completion of the Chapel Building, Therapeutic Pool and Gymnasium Building, and Biological Test Building, all of which are in construction, and the final landscaping of the grounds.

The co-operation between the architects and the general contractor is reflected in the pleasing result of the combination of good design and efficient construction methods.

The architects have grouped the many buildings so as to produce a most pleasing mass and the individual buildings have been designed with dignity, using suitable materials selected for their durability and their appearance.

The contractors have carried out the work of construction energetically and with the efficiency to be found in a firm well equipped and with an organization skilled in carrying out work of a magnitude comparable to Sunnybrook Hospital.

A tour of inspection of the entire project leaves one with the impression of completeness and efficiency rather than lavishness.

A substantial amount of money has been provided for the development of the Landscaping of the grounds, which will take in the Red Cross Lodge, a building erected by the Red Cross Society for the convenience of the patients and visitors to the Hospital.

The visitor to Sunnybrook Hospital will note at the entrance gates, a plaque which reads as follows:

"These beautiful grounds, donated to the City of Toronto, as a memorial park in honour of the late Joseph Kilgour, were, with the gracious consent and approval of the heirs to the Kilgour Estate, conveyed to the Dominion Government in the hour of Canada's crisis, to be used as a place of healing for those who sacrificed and suffered in the preservation of Canada's freedom."

The architects, it is believed, have designed a Hospital well in keeping with the sentiments expressed, and the contractors have carried out their work to the satisfaction of all concerned.

SUNNYBROOK IN OPERATION

By K. E. HOLLIS, M.D., Superintendent

"TO honour the dead and to care for the sick and the injured, Sunnybrook Hospital stands as a living memorial to the men and women of the armed forces of Canada."

These words inscribed on the pylon to the left of the main entrance into the hospital grounds tell the true purpose of Sunnybrook. From the dignified entrance, through the beautifully landscaped foreground, on to the impressive buildings with their massive, sweeping lines, and into the interior; there is evidence of the honour paid to our heroes of two wars. This is achieved by masterful design, practical planning, durable structure, and by simple but attractive decoration. This institution offers succour and treatment to their comrades who returned. Truly Sunnybrook is a spiritual as well as a utilitarian memorial. The people of Canada, through their government, have in an impressive manner expressed their gratitude to all service men and women, who made sacrifices for their country. The dignity of the buildings is symbolic of the noble sacrifice. The humanitarian purpose, for which the memorial is erected, perpetuates "service".

The aesthetics of Sunnybrook have not been overlooked. Considering the location in the midst of three hundred and eighty acres of picturesque park lands and on the edge of a beautiful ravine, the architects have most effectively styled the buildings to the terrain on which the hospital is built. The interior has been so well considered that the comfort and the psychological effects of pleasant surroundings are to be found everywhere. The soft pastel shades used in the wards and corridors are most restful. The leather upholstered sectional furniture, with other striking appointments, and the colourful draperies at windows of all wards and common rooms, invite the patients to relax.

Frequently the question is asked by visitors who are awed by the magnitude of this institution: "How do you operate so large a hospital?" The method is simple. There are twenty-eight units. Each unit is developed around a nurses' station and work-room, fully equipped with instrument and utensil sterilizers, sterile water tank, built-in narcotic safe, cupboards, call registry, and all other essentials for the nursing care of approximately fifty patients. Each hospital service is allocated one or more units, according to its requirements. Each service has its charge surgeon or physician, and each unit its charge nurse, with other necessary personnel. Complete daily inspections are impossible, but reports rendered twice daily by each unit, keep the administration well posted.

Departmental hospitals for the treatment of veterans, present problems not encountered in civilian institutions. The percentage of ambulatory patients is greater. These patients, who may be in for investigation, or for the fitting of some prosthesis, or for an accurate assessment of physical disability, must be provided with opportunities for diversion. The games rooms, bowling-alleys, writing-room and library afford accommodation and facilities for this group to spend pleasantly their spare time. The less active may prefer to read or enjoy a game of chess, cards or draughts with a fellow patient in one of the many spacious and attractive sun-rooms adjoining the wards. Space and facilities have wisely been provided for that genial group of ladies, the Red Cross workers, who regularly distribute comforts and cheer among the patients, or skillfully guide the veteran in the art of leather work or some equally absorbing craft.

The auditorium, which accommodates eight hundred, is a valued feature. Its excellent acoustic properties, its stage adaptability to all variety of purposes, its perfect lighting, its committee rooms, its attractive foyer, and its promenade corridor, are all subjects of favourable comment. From this hall many excellent entertainments have been given by outstanding artists and generous groups of citizens. All have been thoroughly enjoyed by veteran patients. The auditorium is also the locus for the tri-weekly motion pictures, occasional dances, scientific conferences and many other events. A recreational supervisor has his office in the hospital, and correlates all social activities and entertainments.

In veterans' hospitals also, every effort is made to prepare the veteran for some gainful vocation when he is restored to health and ready to take his place in the life of the community. Members of the Casualty Rehabilitation Section are provided with accommodation for this training, and offices from which to operate. Likewise, a staff to investigate social problems that may be a factor in the patient's physical state must be provided with office space and consulting rooms.

Physiotherapy and occupational therapy are utilized to a greater extent in veterans' hospitals than are likely to be employed in private treatment centres. Liberal space has rightly been devoted to these branches, which are adequately equipped for, and adapted to the most modern and scientific practice of this form of therapy. A modern gymnasium with therapeutic swimming pool, which is now in the course of construction, will be a valuable addition to the facilities for physiotherapy at this hospital.

The acoustic treatment of the hospital is impressive.

Noises can be most disturbing to both patients and staff. Acoustic tile in all wards of four beds or more, and similar treatment in corridors, offices and common rooms has reduced noises to a minimum, and contributed to the comfort of the patient. The visual call system is a marked improvement over any audible system. It has proven quite adequate, and its noiseless operation is an appreciated factor. For any hospital, housekeeping facilities are important. The numerous, thoroughly equipped cleaners' closets, carefully placed so as to serve all areas of the instiution, are most serviceable. Architectural features such as flush trim, coved wall and floor joints, careful omission of dust catching surfaces, fully tiled walls in all toilets, and utility rooms, have all contributed to easier and better housekeeping.

The care of the sick is the prime function of a hospital. At Sunnybrook this important objective has been kept to the fore by the architects, in close collaboration with professional advisers. Each unit is complete with nursing-station, utility room, linen room, physicians' offices and examining rooms, and waiting rooms for visitors. The largest ward accommodates twenty-four beds. These large wards are sub-divided into six sections, and each bed has its own cubical screening, thus affording, even in the largest wards, the privacy so often desired by the sick. The remaining rooms are smaller, serving the needs of one to four patients. All wards are so located as to permit a profusion of warmth and cheer by an abundance of sunlight. The ward furnishings have been chosen with a view to comfort and utility. Patients may summon nurse or orderly with the least effort by use of a call system operated from each bed. Sun-rooms and sun-decks are within easy access for all patients, whether bed-fast or ambulatory.

The operating-rooms located on the seventh floor are the realization of a surgeon's dream. Incorporated in their planning are all the modern features that offer the maximum facilities to skillful surgeons, and reduce hazards to a minimum. In the operating suite there are facilities for complete emergency X-ray and laboratory service. A blood bank service is also provided in this area.

The pathological, bacteriological and chemical laboratories are excellently designed and equipped. Some one hundred and eighty thousand procedures are done in this department annually. In designing hospitals, particularly in the past, too little space has been allocated to the laboratories. Through constant research, progress is being made in laboratory sciences introducing new procedures and techniques which are definite diagnostic aids. These new methods must be adopted by all progressive clinics, and additional space for carrying out these tests must be found. Presently Sunnybrook has no provision for extension of this service. A biological test building has been authorized and soon will be constructed. This, to some extent, will relieve the congested space which was thought quite adequate in the planning stage of this project.

The X-ray Department, in physical lay-out and equipment, ranks with the best on the continent. Its location at the western end of the hospital has occasioned some comment, but in functional operation it is found to be convenient, in that a large percentage of cases referred to this service are from the Out-Patient Clinics, which are conducted on the two floors immediately above the radiological department. Over thirty-five thousand diagnostic examinations and a large number of deep and superficial X-ray therapy treatments are given at Sunnybrook annually. About forty thousand cases are treated through the Out-Patient Department of Sunnybrook per year. For this large volume of work several highly specialized clinics have been established and conveniently located near the hospital entrance. To facilitate and expedite this work the planning of the Out-Patient Department was the subject of many conferences by architects, hospital administrators and clinicians. All the features pertinent to each specialty have been incorporated in the structure providing most up-to-date facilities. The admirable results obtained are well demonstrated in the smooth and efficient daily operation of this important branch of hospital work.

A complete dispensary service is provided at the hospital. Some six thousand prescriptions are dispensed monthly by the hospital pharmacists from an up-to-date and convenient department. The dispensary has been so designed and placed as to serve both in-patients and out-patients with the minimum of staff. The bulk stock rooms, immediately under the main dispensary and connected with it by a dumb waiter, contribute to the careful and orderly operation of the pharmacy.

A central supply room is now recognized as an essential in all modern hospitals and if properly used is an important economic factor in hospital administration. The central supply room of Sunnybrook is located on the ground floor of the main building. From here all centres, except the operating suite, are furnished with required sterile equipment. Sterile trays for all procedures are assembled, wrapped, sterilized and issued to wards on request. Ample work surface, storage cupboards, sterile water supply and built-in autoclaves have been supplied in this area to permit efficient handling and proper asepsis.

The dietary needs of this large institution have been well provided for. A large, excellently equipped and conveniently arranged central kitchen, with a capacity of five thousand meals, serves the entire institution. From the main kitchen the food is carried in pre-heated conveyors to ward serveries at each unit. From these it is served to bed patients. Ambulatory patients may have their meals in a large and attractive cafeteria.

Laundry problems have been largely solved by the provision of a laundry to handle the entire requirements of the institutions. The aggravating delays in processing soiled linen by large commercial laundries have completely disappeared. The linen traffic is confined to the

hospital. The venture has proven economically sound. Some adverse comments have been offered because all the laundry operations are not carried out on one level. Space and required capacity determined the present arrangement by which the ironers are located on a mezzanine floor.

The original project included a residence for non-professional staff. This building has been erected, but is not being used for the purpose for which it was designed. Alterations are now being carried out to provide a geriatric wing. The additional accommodation for one hundred and seventy patients in this building will bring the total capacity of the hospital up to fifteen hundred beds.

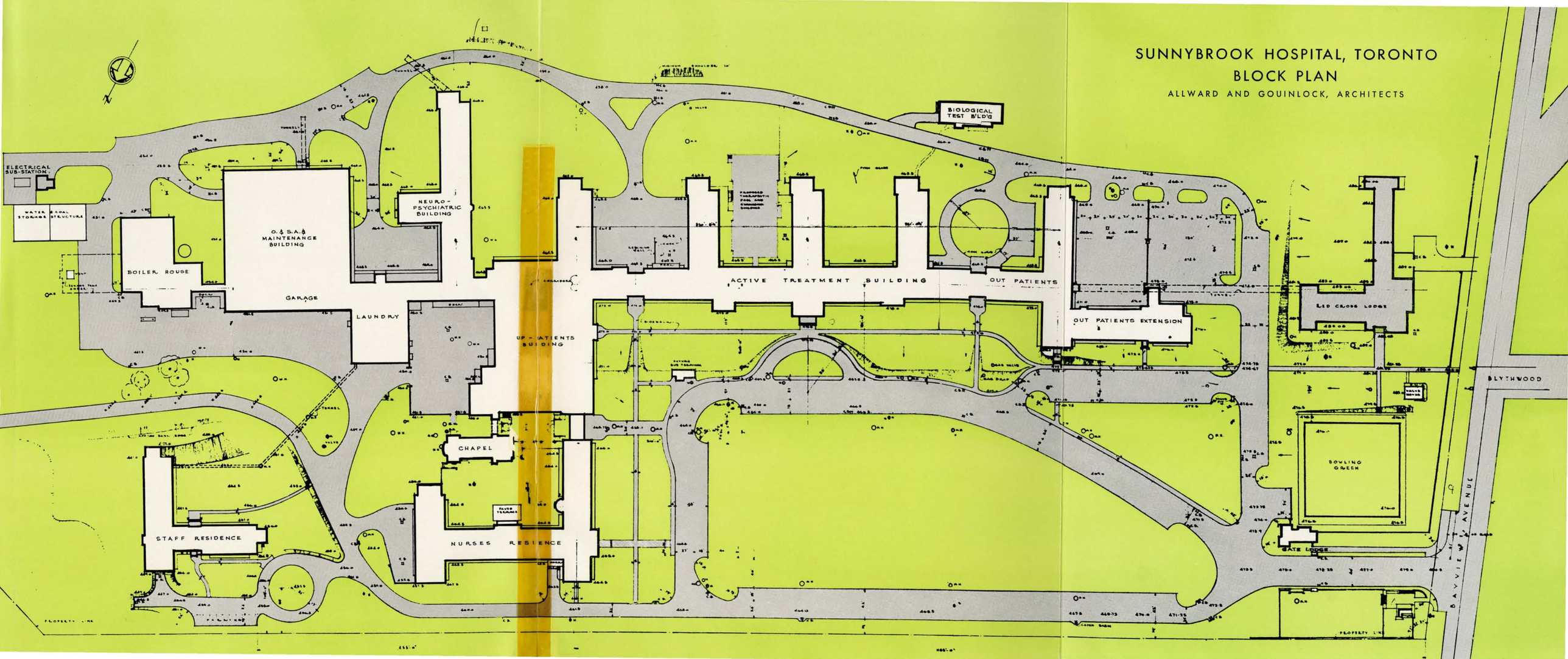
A very commendable adjunct to the hospital is the attractive and commodious residence for nurses. Conforming to the general architecture of the treatment buildings, it overlooks the grounds at the front of the hospital from the east. For its interior design the architects have avoided the dormitory effect and created a home. In addition to the games room, large and small reception rooms and library on the main and ground floors, there are on each floor lounge rooms, sun-rooms, kitchenettes and small laundries, for the convenience of the resident nurses. The nurses' residence is U-shaped. In the quadrangle formed by this building and the hospital proper, a chapel is being built. Around the whole a formal garden will be developed. The chapel is another feature peculiar to a veterans' hospital, but essential in that many patients are hospitalized for long periods, and some continuously. For them this will be the only consecrated building for devotion. Though far from completion, we are assured that the architectural treatment of this place of worship will have that dignity and calm so greatly desired in all churches.

In citing some of the many features that contribute to the functional operation of this large institution, there is one feature that is unique in hospital planning — the provision for the manufacture of all prosthetic appliances within the institution, where the patient is treated and prepared for the use of the appliance. In our surgical wards an amputation is performed. The stump is made ready for the artificial limb. The limb is manufactured in the Prosthetic Service Factory and properly adapted to the patient's needs. The patient is also instructed in its use under the supervision of the surgeon and manufacturer. Similarly all prostheses that are necessary for the optimal rehabilitation of the veteran are made, adjusted, and tested by those most interested in perfect results.

Sunnybrook is a post-graduate teaching centre. Facilities for this most important work are not wanting. A large clinical lecture room, built on the amphitheatre style, was included in the architectural plans. Here leaders in the various medical and surgical specialties conduct their lectures to residents, internes and other staff. Throughout the hospital are several small, well-equipped laboratories, where graduates may carry on special research or investigation on individual cases. As a post-graduate teaching centre the hospital is affiliated with the Medical School of the University of Toronto, from which the hospital draws most of its professional staff. In order to be an interne at Sunnybrook a medical graduate must have completed one year of rotation service in a general hospital. Many graduates are training at Sunnybrook for certification in a specialty or for fellowship examination in The Royal College of Physicians and Surgeons (Canada). This university association and training programme, aided by excellent physical facilities and the most modern diagnostic and therapeutic equipment, assures for our veterans the service of our leading specialists in the medical field and the keenest brains of our younger doctors.

All who have been hospitalized in this institution have a deep sense of gratitude to the people of Canada who gave this great memorial for their care and dedicated it to the memory of their fallen comrades. To those who are in any way associated with the care of the veteran at Sunnybrook, a definite challenge is given — a challenge to render a service commensurate with the facilities and opportunities that have been provided.

SUNNYBROOK HOSPITAL, TORONTO
BLOCK PLAN
ALLWARD AND GOUINLOCK, ARCHITECTS



THE PLANNING OF SUNNYBROOK HOSPITAL

By HUGH L. ALLWARD
ALLWARD AND GOUINLOCK, ARCHITECTS

THE planning of Sunnybrook Hospital was started in the late autumn of 1943. The invasion of Europe was already scheduled – making the early availability of the Hospital, even in part, a matter of the utmost urgency.

The property on the north-easterly outskirts of the city had been donated to the City of Toronto some years ago by the estate of the late J. Kilgour, and was known as Sunnybrook Park. An exhaustive search by the Government for suitable properties had been unproductive. Realizing the vital importance of the problem (site), the Corporation of the City of Toronto, with the consent and generous co-operation of the Kilgour family, made the park available to the Dominion Government. The property is in every respect a most desirable one; on high ground overlooking Toronto and Lake Ontario to the south, and bounded more intimately by ravines on the south and east. A clear-running stream adds charm to a broad valley available to patients and their friends.

That portion of the property devoted to the hospital buildings, fronts on some six hundred feet of Bayview Avenue and extends several thousand feet to the east. Both Bayview Avenue and Blythwood Road provide direct routes to the city, and have been developed as broad, well surfaced traffic ways.

This parcel, roughly 600 feet from north to south and 3,000 feet from west to east, is, at its easterly limit, some 35 feet below Bayview Avenue. This even gradient from west to east was a significant factor in the development of the partis.

The property was devoid of roads or services. Hence, the early development of a system of underground services; water, steam and sanitary sewers, fire protection, gas, electrical and telephone facilities; together with roads to serve construction purposes, was essential.

It was quite apparent that under the then prevailing building conditions, with shortages of both labour and materials, the development must be so planned as would make possible the orderly and progressive construction of the separate units of the hospital and achieve occupancy of such units in a sequence best designed to meet the needs of the hospital authorities.

The Department of Veterans' Affairs, in collaboration with their Toronto District Officials, had established in broad principal the needs of the district which were to

be met by the new hospital. The principal elements of the programme are enumerated to assist the reader in relating the problem to the Master Block Plan.

An Active Treatment Unit for the care, both medical and surgical, of some 750 patients.

An Up-Patients' Building to house some 250 ambulatory patients and to provide in large part the recreational facilities for all patients, nurses and resident staff. As the overall plan was developed, the kitchens and general dining rooms for patients, nurses and staff were embodied in this building.

An Out-Patients' Clinical Building. Again, as the planning proceeded, the upper floors of this building were allocated for the accommodation of female patients and patients of commissioned rank.

A Psychiatric Unit of 150 beds housed in a separate building.

A Nurses' Residence to house 300 resident nurses.

A Staff Residence to house 100 male and 50 female resident staff.

The 1943 planning contemplated a unit of 150 beds for the diagnosis and early care of T.B. patients, which is still in abeyance.

In addition to these buildings, all housing either patients or resident staff, were a number of essential services, namely, an Electrical Sub-station, a Boiler House, a Laundry (sufficient capacity to care for the laundry of the Toronto District of the Department of Veterans' Affairs).

A factory for the manufacture of Orthopaedic and Surgical Appliances, together with fitting rooms, exercise rooms, etc., was designed to care for the needs of the Department across the Dominion. A Hospital Maintenance Department was planned in this building.

A Gymnasium Building, to provide exercising facilities as well as a small swimming pool for treatment purposes.

A Chapel with seating capacity of 120.

A Gate Lodge for the control and direction of traffic and visitors.

A Bus Terminal – the hospital is served by buses operated by the Toronto Transportation Commission.

The programme, made up of these major and secondary buildings, was established early in 1944 as the result of almost continuous consultations with senior personnel of the Department of Veterans' Affairs. The decisions reached at that time proved to be, in large part, sound, and the accommodation as ultimately built followed closely the broad pattern planned in the early meetings. In fact, of the original partis, only one building failed to materialize and the function of only one other unit was radically altered.

With the various treatment services and accommodation allocated to specific buildings, the preliminary plans of the individual units were started. Coincident with these studies, the Master Block Plan was developed. The plan, locating the buildings, large and small, together with all the services, roads, etc., on the property, proved a most interesting study. The relationship of each building to its neighbour obviously had a constant bearing on the design of the individual units. A great number of studies of this plan were made – each one which appeared to give promise of a satisfactory solution called for the reconsideration of the design of the principal units. Finally, a decision was reached to adopt the plan as illustrated.

It will be seen from the plans that patients' accommodation is largely provided in wards of one, two, three, four and twenty-four beds. With the relationship of large and small wards determined, it was possible to establish nursing units, floor areas, etc., and, hence, the number of floors in each of the buildings.

The heights of buildings, general allocation of floor space, locations of elevator banks, service stacks, public entrances, etc., had, of necessity, to be permanently fixed. Likewise, provision for all mechanical services; the locations and extent of service tunnels; equipment rooms; pipe spaces and innumerable similar details, had to be planned. As the drawings were developed every effort was made to allocate space only for treatment units and to leave the detailed planning of such areas in a fluid state. Consultation with the medical personnel and the preparation of innumerable studies of alternate layouts continued as surplus or lack of floor space in one area or department became apparent. The consequent replanning to achieve the necessary balances was a protracted operation.

The Architectural massing of the component units of the hospital had, of course, been the subject of exhaustive study in conjunction with the block plan. Any change in the height, profile or cardinal elements of a unit which might result from the re-adjustment of a plan had to be carefully considered and reconciled with the overall design.

It was at this stage that the urgency of the programme proved most burdensome. In order that delay be avoided, and the carefully planned programme be maintained, it was frequently necessary to work day and night for weeks at a time.

In detail, the exterior treatment of the buildings was largely dictated by the usage of the space therein. The tremendous number of windows of the same size, and so located as to best light the wards and service rooms, produced in themselves a pattern. Studies were made of possible groupings, of the vertical or horizontal accentuation of the pattern. None of these was found convincing and the normal, natural pattern was adhered to.

The choice of materials of which to build the hospital was limited. The Dominion Government, as clients, stipulated the use of Canadian materials and equipment of a Canadian manufacture wherever possible. Wartime limitations had drastically narrowed the selection of material available – both from Canadian and American

sources. Marked shortages of skilled labour for the fabrication and erection of equipment still further had a bearing on the consideration of construction methods and materials.

The exterior brickwork is carried out in a grey manganese brick with a base, running courses, window sills, cornices, etc., of Queenston Limestone. Running courses of stone are tooth-tooled and the ashlar base bush-hammered. Window frames and sash are generally of wood; steel sash is used in Sunrooms and throughout the auxiliary buildings. All windows in patients' accommodation are double glazed. Both upper and lower sash in the double hung wood window units are pivoted for ease of cleaning.

The selection of materials for the interior finishes was the subject of exhaustive study and consultation with the hospital authorities. The generous co-operation and assistance by superintendents and staff of other hospitals was of great assistance, and is deeply appreciated. The divergent opinions expressed by those of long experience were matters of interest. Very briefly, the interiors of Sunnybrook are as follows.

Linoleum on the floors of wards, corridors, dining rooms and recreation areas.

Terrazzo on the floors of ablution rooms, service rooms, entrances, etc. Terrazzo extended base is general.

Structural glass on the walls of ablution rooms, with glazed tile in staff toilets and service rooms. Toilet and shower partitions in patients' rooms are of structural glass, and of marble in staff rooms.

Ceilings of all the larger wards and public spaces are finished with wood fibre acoustic tile. The corridor ceilings have removable perforated acoustic tile panels, providing ready access to services distributed above a system of metal furring.

Serveries, utility rooms and service rooms generally are fitted with equipment of stainless steel where exposed to water, and galvanized iron elsewhere.

The study and selection of materials for construction and finish by the architects was paralleled by the Consulting Engineers in their choice of methods, materials and equipment. Meetings were held at frequent and regular intervals when the problems of all concerned were carefully studied; conflict between architectural, structural and mechanical elements and installations were by this constant liaison reduced to a minimum.

In June, 1944 tenders were invited for the first three buildings – The Boiler House, Neuro-Psychiatric Unit and the Up-Patients' Building. This programme included for the nucleus of all services and the construction of service roads so located as to later be finished and serve as portions of the ultimate road system.

The Up-Patients' Building is so called because of the high percentage of ambulatory patients normally under treatment. Logically, it was developed to include the major recreational facilities for the entire hospital – Auditorium, Lounges, Games Rooms, Billiard and Writing Rooms, Bowling Alleys, Canteen, etc. Likewise, this unit houses the large Dining Rooms for the whole institution – patients, nurses and staff. The Main Kitchens, Storerooms, Diet Kitchens, Bakery, etc., are located in this building, and from this centre, food is distributed to serveries throughout the institution. Work in the field on these early buildings and services started in August 1944.

The construction of the hospital under a number of separate contracts, naturally created many administrative problems. Such difficulties were, in part, however, offset by the additional time thus made available for the study of subsequent buildings. As these buildings of early units proceeded, the architects were afforded constant opportunities to amend, simplify and improve such details as proved unsatisfactory or costly in their early installation. Procurement problems were encountered almost immediately and it was frequently found necessary to adopt alternative materials and methods of construction in order to maintain progress on the work.

Work on the drawings for the Active Treatment and Out-Patients' Buildings proceeded steadily. A contract for the foundations and sub-structure of the two buildings was awarded late in 1944; a contract for the structural steel frame shortly afterwards, and a general contract for the completion of the two buildings in September, 1945. The drawings and specifications of these two buildings were prepared with a fund of information as to availability of materials, rates of delivery, etc., made available by experience on the earlier contract. It was gratifying to have these two buildings and, in fact, all subsequent construction, carried out with comparatively few and minor departures from the specifications.

The detailing of all the foregoing buildings, involving, as they do, all the facilities for the medical and surgical care of some thirteen hundred resident patients, and many thousands of out-patients, was a major undertaking.

It may be of interest that drawings and details for these five buildings and their related services, numbered between 800-900.

The drawings for the Nurses' and Staff Residences were next prepared. The Nurses' Residence at Sunnybrook is perhaps somewhat more involved a problem than the customary housing for nursing staff. Many of the Nursing Sisters are from the services, and will, in all probability, regard Sunnybrook as their home for many years. Hence, the residence embodies adequate recreation space, lounge rooms, sun rooms, hairdressing parlors, etc. The Staff Residence, a necessity because of the location of the hospital, is designed for the housing of male and female domestic, with recreation and lounge rooms on a more modest scale.

Coincident with the planning of these buildings, every effort was made to complete the drawings for the Laundry Building and a factory building for the manu-

facture of Orthopaedic and Surgical Appliances. The latter, a building of some interest, is designed for the complete production of appliances – from the storage of raw materials, such as willow and leather, in air-conditioned spaces, through numerous complex metal and woodworking operation to finishing and painting departments where the product is highly finished prior to fitting and delivery to the patient. Suitable accommodation is also provided in which the patients, in private, may accustom themselves to the use of these artificial aids.

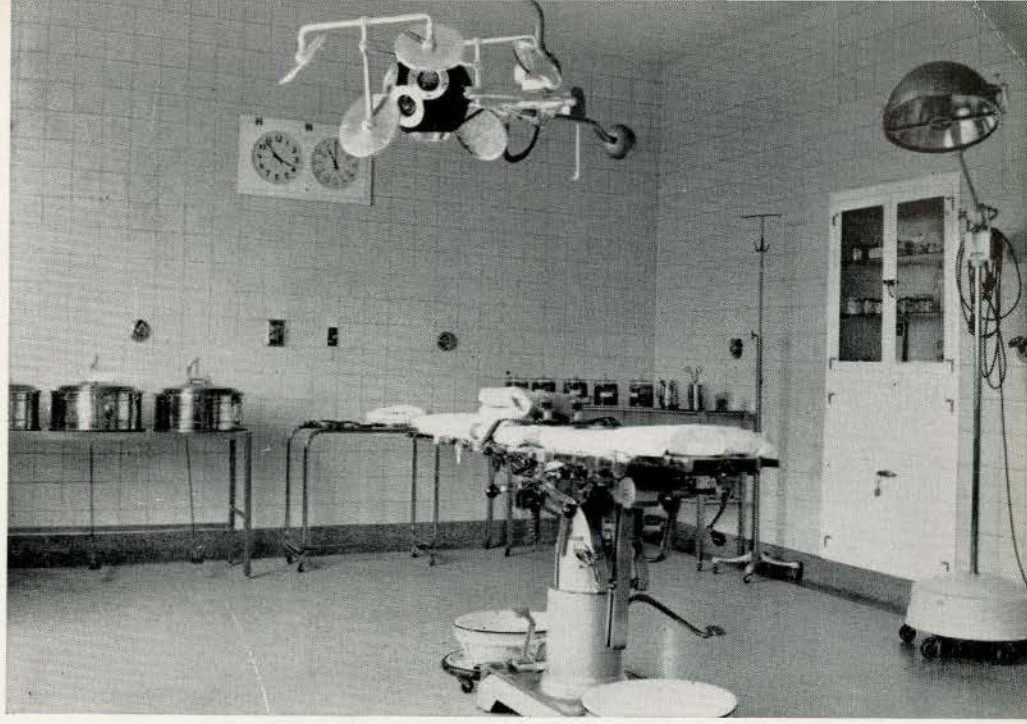
Midsummer 1948 found all the major buildings approaching completion. An extension to the Out-Patients' Building to accommodate expanded services in the treatment of non-resident patients had been started. This extension, which is new in use, provides a complete cafeteria for the use of technical non-resident staff, visiting doctors, etc. A Gate Lodge for the direction of visitors, control of traffic, etc., was under construction and is now complete.

Early in 1949 the drawings were completed and work commenced on the Gymnasium Building and on the Chapel. The first, a treatment building as an adjunct to the Physio and Occupational Therapy Services, a Gymnasium of sufficient size to permit minor indoor sports, various exercise rooms, and a treatment pool. The Chapel, a modest building with seating for 120, proved an interesting architectural problem. It is designed in sympathy with the hospital buildings and connected to the Up-Patients' Building by means of an architectural overhead passage or bridge. Beneath this bridge, flanked on the south by the Up-Patients' Building and on the north by the Chapel, is a small formal sunken garden – a secluded place for the use of patients and their friends.

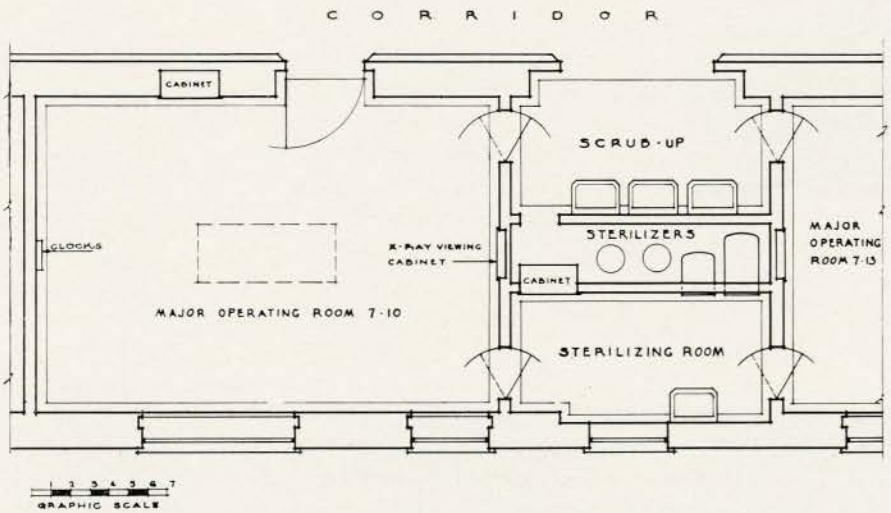
There now remains to be built only the Biological Test Building for small animals, and a Bus Terminal to provide shelter for patients and visitors awaiting transportation. The construction of these two buildings is to commence in the near future, and completion of the Sunnybrook Hospital is anticipated by the early summer of 1950. And so, for the purpose of this article, Sunnybrook may be regarded as finished.

It has proved, as was anticipated, quite impossible to do more than gloss over the problems which beset the architects, and the measures, step by step, by which the problems were solved. A more comprehensive effort, even were it to prove of interest to the reader, would mean looking back on weeks and months of protracted effort, the recall of which is too painful to contemplate.

Sunnybrook is a very large hospital – the largest in terms of patients' accommodation, in the Dominion of Canada. Its size, coupled with the complex auxiliary services, accommodations and buildings, necessary because the patients are veterans, created a very major architectural undertaking. If the hope of the architects is fulfilled, and the future usage of the hospital proves their efforts to be of even some merit, they will be obligated: to the personnel of the Department of Veterans' Affairs and the Department of Public Works, both in Toronto and Ottawa, whose efforts and co-operation were unfailing: to the General and Sub-contractors, who surmounted the innumerable obstacles that beset them before and for some time after the war's end: to the Consulting Engineers, whose enthusiastic co-operation was unfailing, and, above all, to those who actually carried out the drawings and specifications, both architectural and engineering. Only their unflagging efforts, through long years of day and night work, with a minimum of vacations and rest, made possible the maintenance of the programme. The supervision and administration of the work was in itself a major undertaking. The field inspection and the routine established for the maintenance of liaison between the architects' office and the field personnel is the subject of another article in this publication. The system worked admirably because of the untiring efforts of the field personnel.



MINOR OPERATING ROOM



OPERATING SUITE, ACTIVE TREATMENT BUILDING

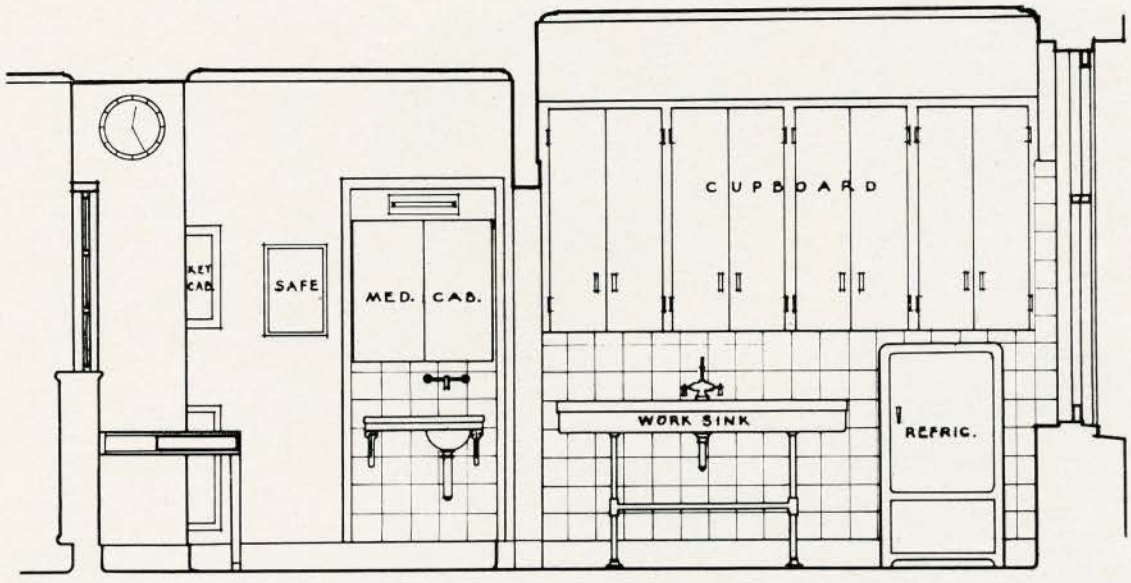
Photographs by Warner Bros.

NURSES' WORK ROOM

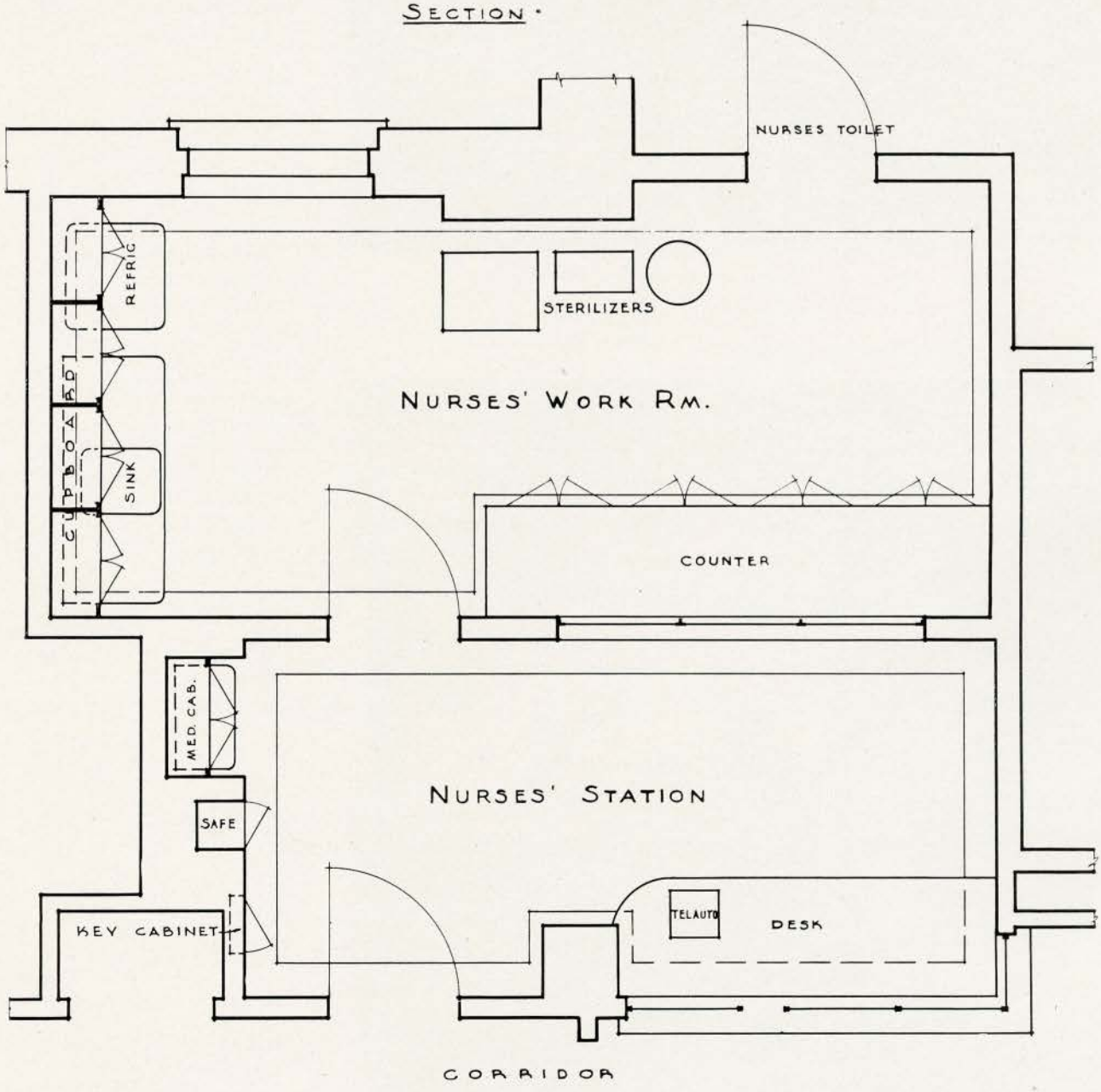
TYPICAL NURSES' STATION

Photographs by Warner Bros.

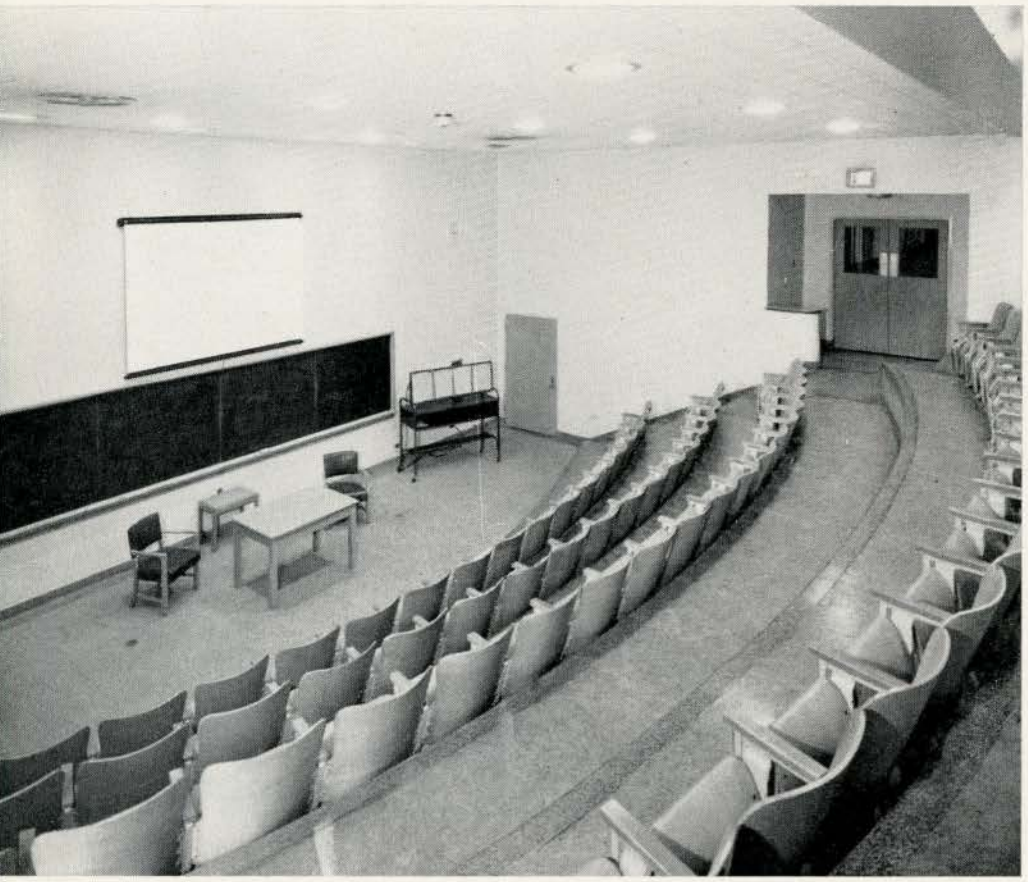
NURSES' WORKROOM



SECTION



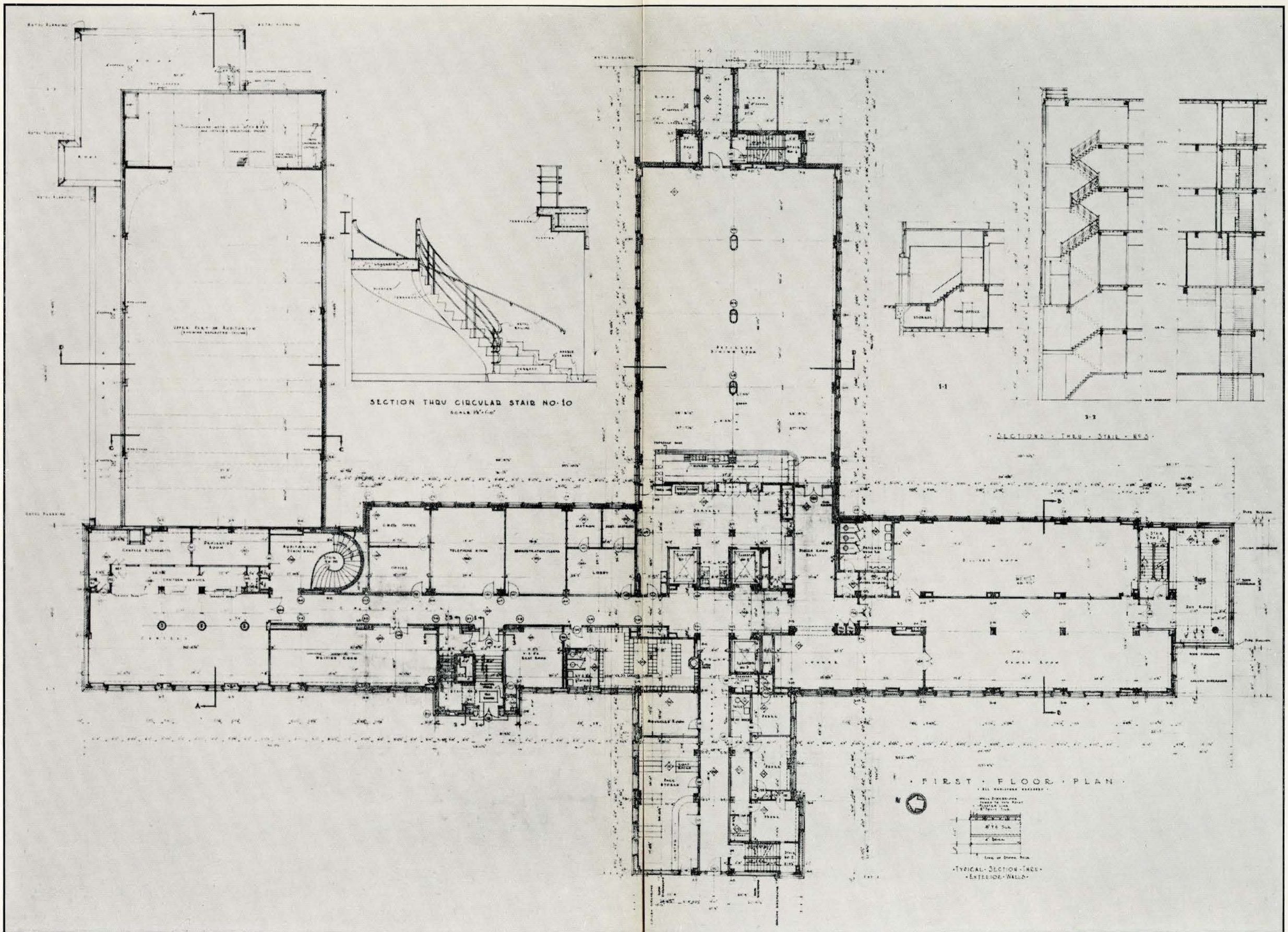
TYPICAL NURSES' STATION



Photograph by Warner Bros.

LECTURE ROOM

TYPICAL TWENTY-FOUR BED WARD



FIRST FLOOR PLAN AND DETAILS

UP-PATIENTS' BUILDING

TYPICAL UTILITY ROOM

Photograph by Warner Bros.

TYPICAL PATIENTS' WASHROOM

TYPICAL PATIENTS' BATH

PATIENTS' TOILET ROOM

CONTINUATION OF PLAN
X_1-X_2 BELOW

CONTINUATION OF PLAN
Y_1-Y_2 BELOW

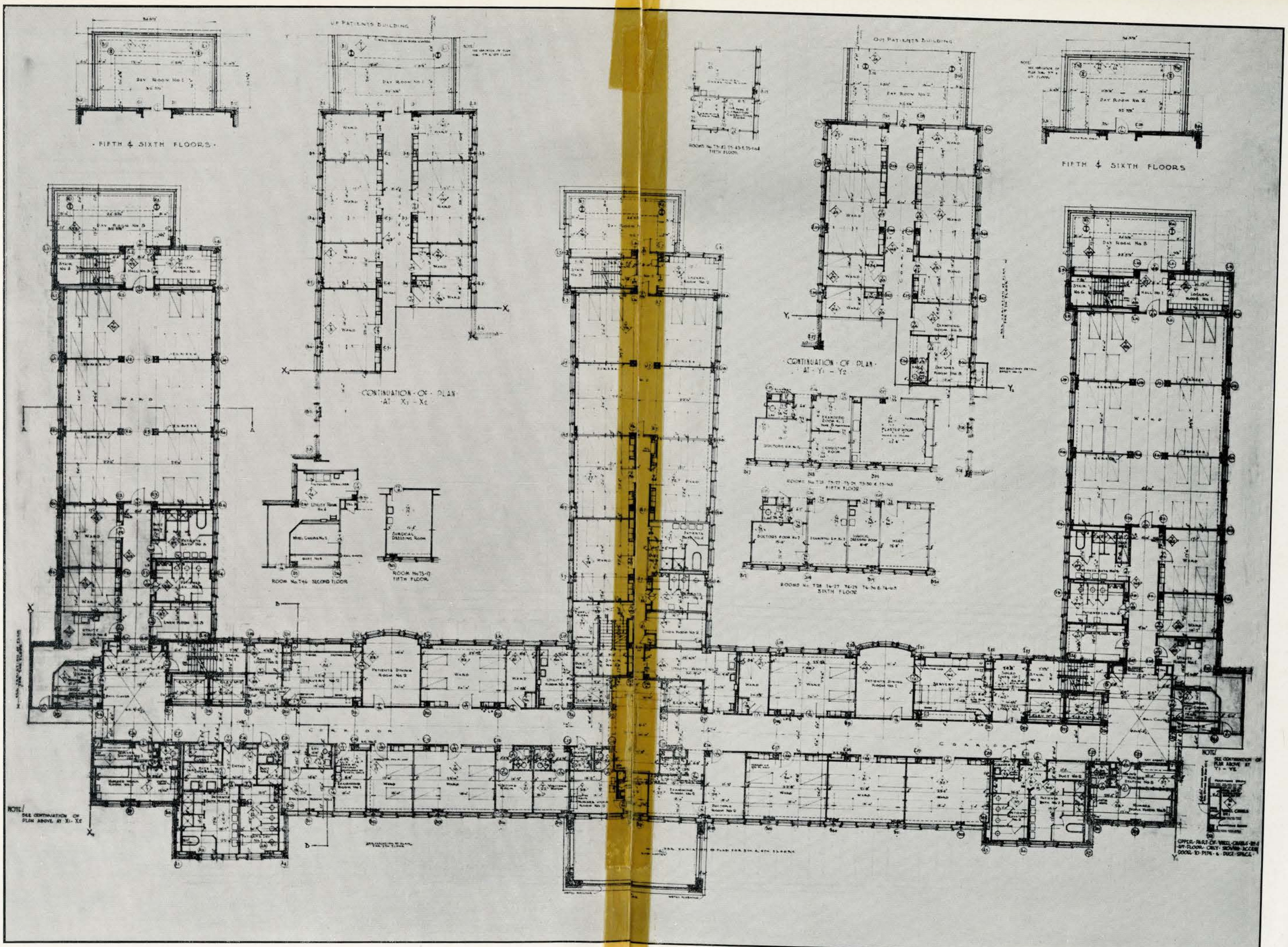
SECTION THRU
SOUTH & WING WALLS

SEE CONTINUATION
OF PLAN ABOVE AT X_1-X_2

SEE CONTINUATION OF
PLAN ABOVE AT Y_1-Y_2

FIRST FLOOR PLAN

ACTIVE TREATMENT BUILDING



TYPICAL FLOOR PLAN
SECOND, THIRD, FOURTH, FIFTH AND SIXTH FLOORS
ACTIVE TREATMENT BUILDING

SEVENTH FLOOR PLAN

ACTIVE TREATMENT BUILDING

Photograph by Warner Bros.

ENTOURAGE DEVELOPMENT AND FACILITIES

By GORDON FOWLER

AS a logical part of early Block Plan study, considerable attention was given to the eventual locating of roads, walks, lighting and probable landscaping. Because of the limited Bayview frontage, it was always doubtful if a second suitable Entrance and Service road could be provided. The desirability of centralized traffic control was always evident. In due course, therefore, the location of the "North" road near the north property line was set. This artery connecting with the existing valley road permitted access to the remote part of Sunnybrook Park as well as providing a trucking way to the heavy service end of the Grounds without interfering with Hospitalization areas. The actual entrance off Bayview Avenue was set in such a manner as to permit an easy entry to the North Road, or any one of the curving drives leading to the various entrances. Generally, traffic on the road circling the grounds on the south is expected to be light; principally, stores and vehicles to the Ambulance entrance.

The routing of all traffic is, therefore, conveniently handled at the Gate Lodge. The Commissionaire's Office acts as an out-post inquiry and information centre essential for the effective direction of visitors. The building itself includes not only an information office but also a drivers' waiting room, and toilets and minor rooms provided for the service of the adjoining Bowling Green.

The Bayview frontage of Sunnybrook Park was originally contained within a stone wall. New brick and stone walls, more in sympathy with the architectural note established in the buildings, were designed. In studies of this nature it became evident that the agreed-upon location of the main Gateway was not suitable for the development of symmetrical Entrance Gates. Moreover, it was felt that the narrow frontage on a busy traffic way demanded some positive accent. In due course, therefore, the Entrance Pylon designed to maintain an aesthetic balance on Bayview Avenue and as an arresting and symbolic finger for high speed south to north traffic was established. Existing grades made reasonably easy the adjoining sunken garden planned as a supporting element to the Pylon itself.

The approach to the main Entrances is as indicated on Block Plan by means of a curved drive restricted to one-way traffic. Parking is virtually continuous on the left hand side. Considerable study was given to the problem and the Architects feel that in this instance the solution is not without merit. It permits the easy loading or unloading of passengers against the perimeter sidewalk. In a relatively wide one-way slow speed thoroughfare, the movement of vehicles backing from parking stalls is easily visible to on-coming traffic. Elsewhere around the hospital, parking areas have been set aside for the use of Public and Staff.

The principal traffic roads are asphalt paved with concrete curbs and gutters.

Road and ground lighting as indicated in the photographs and described elsewhere, is by means of a developed form of stock 25 foot luminaire standards.

No description of this nature would be complete without comment on the grounds. Rough and final grading and sodding were included as a part of the building construction. A suitable underground lawn watering system has been provided, and all the trees and planting visible in the main Entrance areas are the result of a recently begun Landscaping Plan initiated by the Department of Public Works. It can be anticipated that the eventual development of areas now under construction will enhance the setting of a group of buildings of National importance.

ENTRANCE PYLON

VIEW FROM ENTRANCE GARDEN

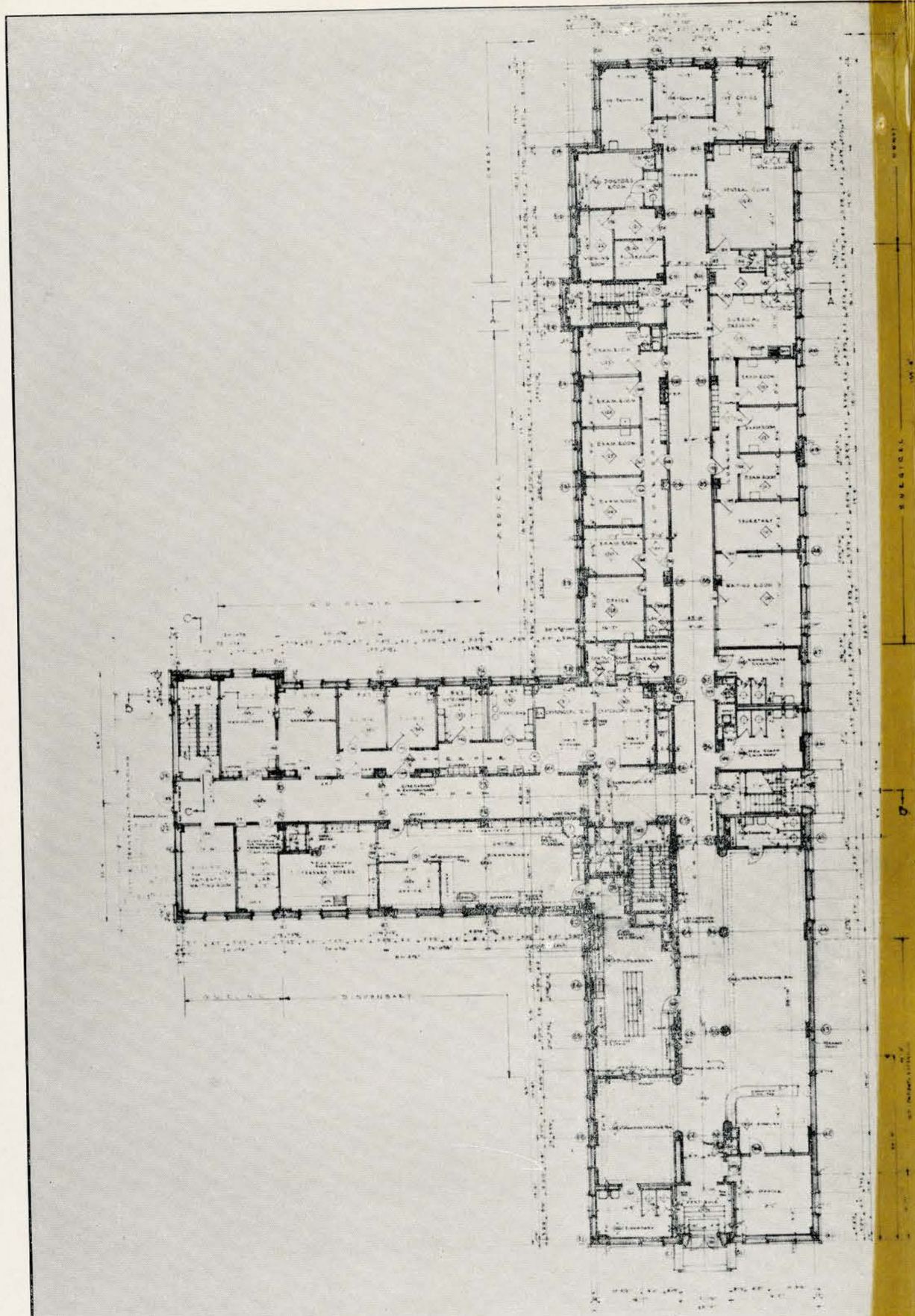
Photographs by Warner Bros.

MAIN ENTRANCE, ACTIVE TREATMENT BUILDING

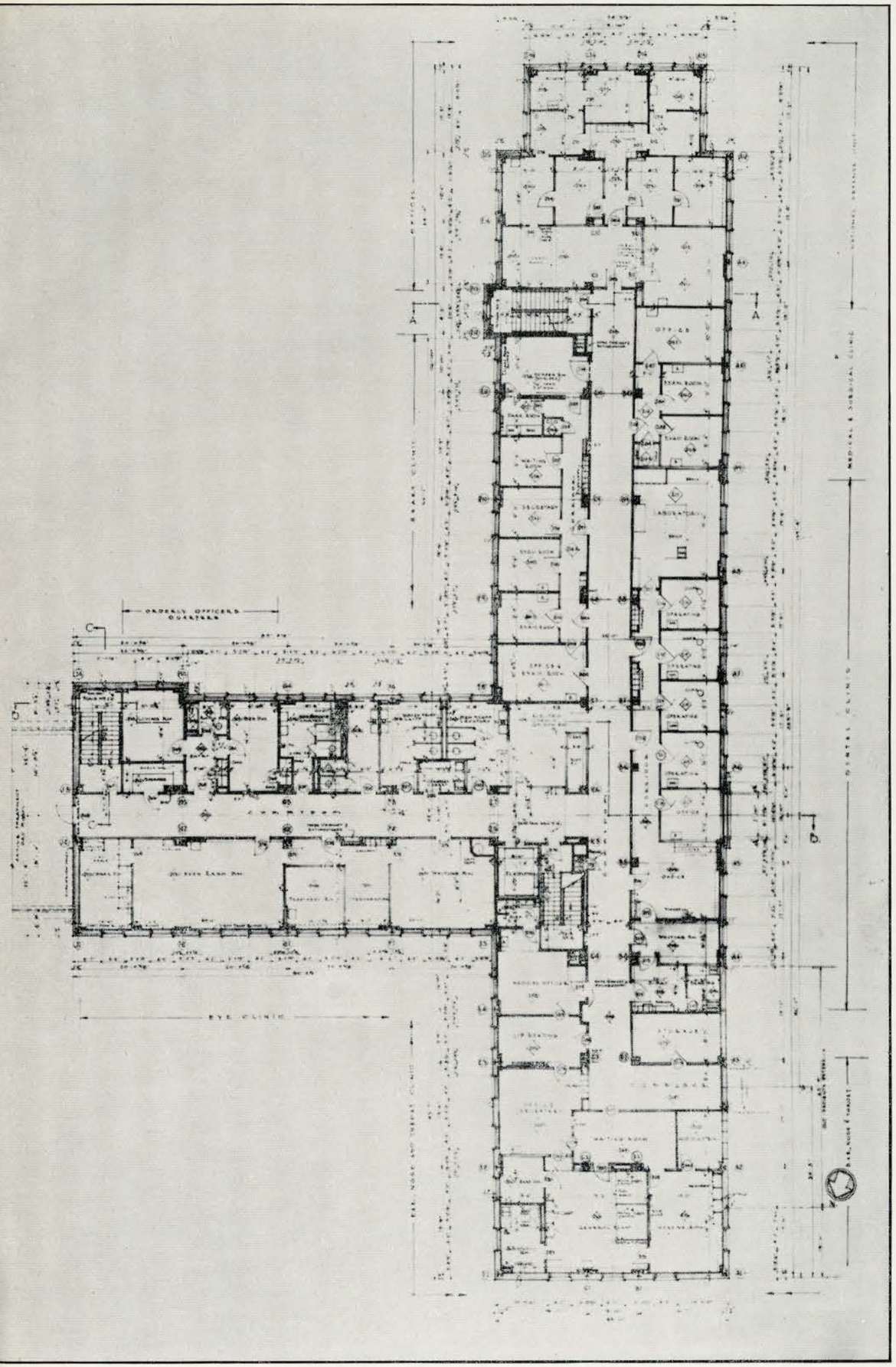
BUILDINGS FROM SOUTH-EAST

ACTIVE TREATMENT AND OUT-PATIENTS' BUILDINGS

Photographs by Warner Bros.



FIRST FLOOR PLAN



SECOND FLOOR PLAN

OUT-PATIE' BUILDING

STAFF ACCOMMODATION

By R. A. FISHER

THE living accommodation for resident staff provided at Sunnybrook Hospital falls, for the present, into two main categories; Internes, who are accommodated on the eighth floor of the Active Treatment Building, and Nurses, for whom a separate Nurses' Residence Building is provided. A separate Staff Residence was also built, for non-professional members of the staff (maids, orderlies, maintenance men, etc.), originally providing accommodation for approximately 40 male and 160 female residents, but this building is presently undergoing alterations to provide accommodation for geriatrics.

Twenty-seven spacious and pleasantly furnished rooms are provided on the Eighth Floor for male internes. Each room has a tiled recess near the entrance, with basin and medicine cabinet, and a large cupboard. A Lounge and large Recreation Room complete the accommodation on this floor, together with centrally located toilet facilities.

The Nurses' Residence accommodates three hundred and four nurses; the great majority in single rooms, with a few in double rooms, and a few suites with private sitting room and bath for senior members. Each room has a basin in a tiled recess, a clothes cupboard, and a large locker in the furred space over the door, for fur coats or other bulkier clothing.

A ten-car garage is provided in the Basement, for the use of Senior Staff members, a large trunk storage space, lockers, toilets, and rest rooms for non-resident nurses, a Games Room with adjoining servery, and perhaps most important of all (for morale purposes) a completely equipped hairdressing salon. The entire west wing of the Ground Floor is given over (in addition to waiting rooms, etc.) to a very large Lounge or Reception Room, a Library, and a private Dining Room in which senior staff members can entertain.

On each floor, in addition to the bedrooms, is a large Living Room with fireplace and balcony overlooking the garden, a sun room, a laundry, and a kitchenette. The Third floor also has an infirmary with accommodation for five patients. At the west end of the Fourth floor are two suites for Matron and Senior Dietician, each with bedroom, private bath, and living room with fireplace. The roof decks with canopies are also provided at this level. Every fireplace in the building is the honest-to-goodness wood-burning type, despite a few mild protests from the engineers at making provision for flues. Another amenity, is the provision of an incinerator, with centrally located hopper on each floor.

No dining room accommodation is provided in this building, other than the kitchenettes and serveries mentioned, as a Nurses' Dining Room is provided in the Up-Patients' Building adjoining.

All elevators in this building are regulation hospital size, so that in any emergency the entire building, or any part of it, could be used as auxiliary ward accommodation.

OUT-PATIENTS' BUILDING

By ALBERT E. WATSON

AT the westerly end of the hospital's serrated skyline and adjacent to the main traffic entrance to the hospital grounds on Bayview Avenue, lies the Out-Patients' Building. While differentiated in occupancy, the structure is contiguous in plan with the other basic elements of the scheme; the connecting link functioning in most part as a Day Room on each successive floor.

This building provides accommodation and facilities for the various medical and surgical clinics where therapeutic treatment is dispensed to ambulant war veterans whose disabilities do not impel hospitalization. An elevator provides vertical transportation to the six floors. All details, surface materials and finishes, are devised with a view to economy of effort in the maintenance of cleanliness. Linoleum for floor finishes, terrazzo for bases, wheel stops and borders; plaster walls and ceilings with all angles coved, finished in oil paint. Corridor ceilings, also Waiting Rooms and a number of Medical Examining Rooms are acoustically treated. Rooms that are required to be darkened to the point of complete elimination of daylight, are equipped with flexible opaque blinds operating within a specially constructed frame permanently secured to the window jamb. Such rooms are those for X-ray, Photographic Dark Rooms, Eye and Fluoroscopic Examination.

The Basement floor, together with the Service Tunnel, is devised entirely for the installation of such service factors as hot and cold water; steam, high and low pressure; electric energy, 25 and 60 cycle; gas and compressed air lines, vacuum lines, sanitary drainage, ventilation ducts and equipment, X-ray Transformers, and such other operational services essential to the adequate treatment of humanity's ills.

The major part of the Ground Floor, comprising some 10,500 square feet in area, provides accommodation for the X-ray Department, a department which plays a major role in diagnostic processes. To provide a means of efficient, rapid operation and adequate care of a large number of patients within a given time factor, the arrangement of the various X-ray rooms and their auxiliary offices was achieved. In this Department are the Waiting Room, Office, Files, Dark Room, Drying Room,

Wet Viewing Room, General Viewing, Directors' and Secretaries' Offices, eight X-ray Rooms, together with their control centres and dressing rooms. Also in this Department, are the high voltage therapy and skin therapy X-ray treatment rooms.

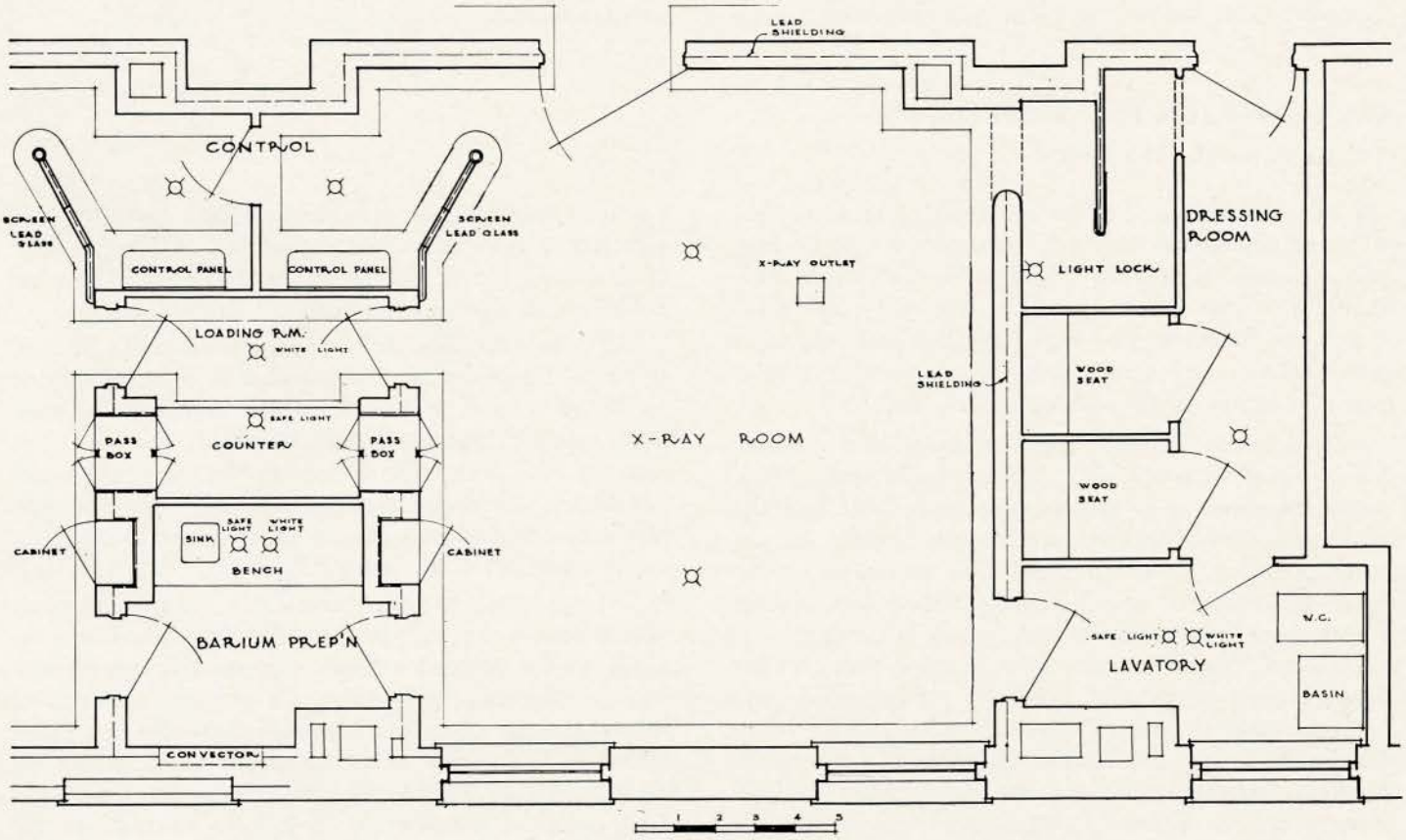
Fig. illustrates the typical arrangement where two X-ray rooms are served by one loading room, a Barium Preparation Room and the Control Room. All walls are constructed of double hollow tile in most part, wherein the $\frac{1}{16}$" lead shielding is fabricated and extends to a height of eight feet above the floor level. This shielding extends into the back of the rebate of the hollow steel door frames, similarly lead shielding is incorporated in the laminated wood door construction and overlaps the lead shielding of the steel frame when the door is closed, providing a barrier to all secondary and harmful rays.

The Loading Room is equipped with Linoleum covered counter top, a pass box at each end, communicating with the X-ray Rooms on either side, devised to permit the passage of the cassettes while maintaining complete darkness and protection from roentgen rays. Below the counter top is provided the live film storage bin, waste receptacles and a storage compartment. At a convenient height over the counter is the storage rack of steel for the cassettes. All of these rooms are equipped with normal electric lighting and safe lighting. Contiguous with each X-ray Room is a Dressing Room provided with several compartments for the use of patients and communication is made with the X-ray Room by means of a light lock.

Closely related to the X-ray Machine Rooms is the Dark Room; here are the tanks for the developing, fixing and washing processes and adjacent is the room equipped with drying cabinets mechanically ventilated. All Developing Rooms are provided with red quarry tile floors. Ingress and egress to these rooms is, in all cases, by means of a light lock or maze, rather than a system of doors. The walls of these light locks are finished in plaster and painted black. The Dark Room walls are plastered and finished in light colours with oil paint.

On this floor also is the Photographic and Art Department where records, photographic and graphic, are made of pathological and physiological cases; here are photographic studios, drawing and modelling studios, and developing dark rooms.

Topographical conditions of the site are such that the main entrance to this building is situated on the north side at the first floor level. Here is the main Waiting Room, Reception Office and Dispensary. In the South Wing are the Medical, Surgical and Chest Clinics, each planned with their Waiting Rooms, internal communicating corridors, Examination Rooms and Treatment Apartments. Occupying the south side of the easterly wing is the Genito-urinary Clinic, fully equipped with two Operating rooms, X-ray and other necessary departments.



TYPICAL X-RAY AND CONTROL CENTRE. OUT-PATIENTS' BUILDING

It is essential to provide protection against the hazard of explosion during the use of anaesthetics; in these Operating Rooms, therefore, all precautions have been taken to ground static electricity. A grounded metallic grid is insert in the terrazzo floor. All electric fixtures, switches, receptacles and other electric devices, all of which are subject to arcing during operation, and a source of ignition, are explosion proof.

On the Second Floor is the Ear, Nose and Throat Clinic. Here, may be mentioned, is constructed an Audiometric Chamber, the design of which is based on data derived from modern acoustic research which reduces externally produced sound by 60 decibels within its enclosing walls.

On this floor also are the clinics for Eye, Heart and Dental treatment. At the southerly end of this floor is the Optical Department where prosthetic eyes are made and fitted for those veterans who have experienced the misfortune of losing their sight.

On this floor also are staff lavatories and the orderly officer's quarters.

The Third Floor is devoted to ward accommodation in units of two, three and four beds, together with four private rooms, a total of 49 beds.

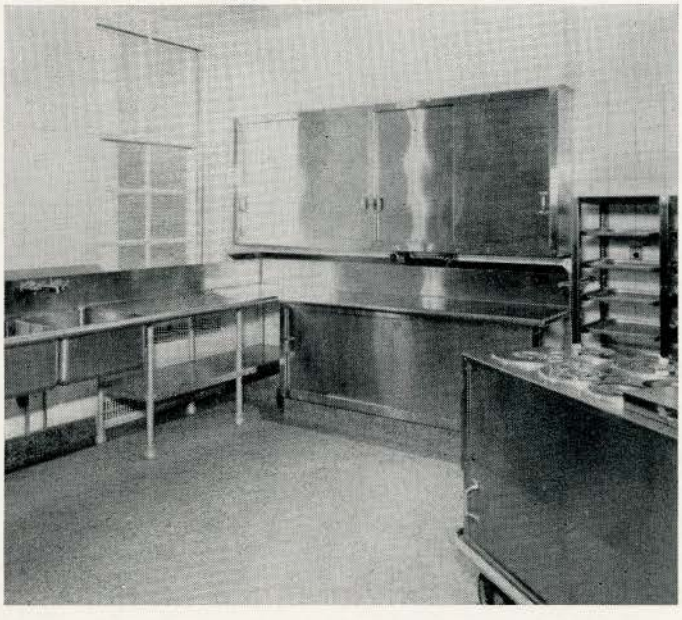
The Fourth Floor is reserved for women members of the auxiliary forces; there are two, three and four bed wards and four private rooms, providing accommodation for 48 patients. Each of these two floors, in addition, is provided with Nurses' Station, Nurses' Work Room, Utility Room, Washroom, Servery and Dining Room, together with Linen Storage and Soiled Linen disposal. Visitors' Waiting Room and Flower Rooms are also within these areas. At the southern extremity of each of these floors is a Day Room from which vantage point the convalescent patient may command a magnificent view of the sylvan slopes of the ravine immediately to the south of the Hospital grounds and the delightful community of Leaside beyond.

FOOD PREPARATION

By **GORDON FOWLER**

IT has been shown elsewhere that early planning determined the location of the Main Kitchen in the Up-Patients' Building. The establishment of the Kitchen logically determined the inclusion of main Dining areas for walking Patients and Staff at some near point. Hence this building, a portion of the first contract, houses all the principal Dining Rooms of the Hospital. These include Maids' and Orderlies' Dining Rooms on the Ground Floor, Patients' Dining Room on the First Floor, and Nurses' and Doctors' Dining Rooms on the Second Floor. Their location almost vertically above one another and the Kitchen permits speedy efficient service off common service elevators.

Trucking access to the Kitchen is by the north road to an enclosed court on the north-east side of the building. The accompanying layout portrays the general disposition of units and department provided. The Kitchen itself is rectangular in shape with overhead monitor lighting. It is bounded on the north side by low wall partitions (4') enclosing food preparation areas which in turn, are in direct contact with their own refrigerated or storage vaults. On the east side, an area is set aside (4' partitions) as a Bake Shop. The space between Kitchen proper and main corridor on the south, also contained within low walls or counters, accommodates Pot Washing and truck storage and loading areas. The principal Dish Washing and Truck Washing Rooms are directly across the south corridor. The position of related areas to the main ones specified can be followed on the drawing. Stainless Steel is used almost exclusively for sinks, counter and working tops throughout the area. Floors are of quarry tile, walls of glazed tile and plaster, and ceiling acoustic tile of the perforated, asbestos faced, removable panel



TYPICAL SERVERY

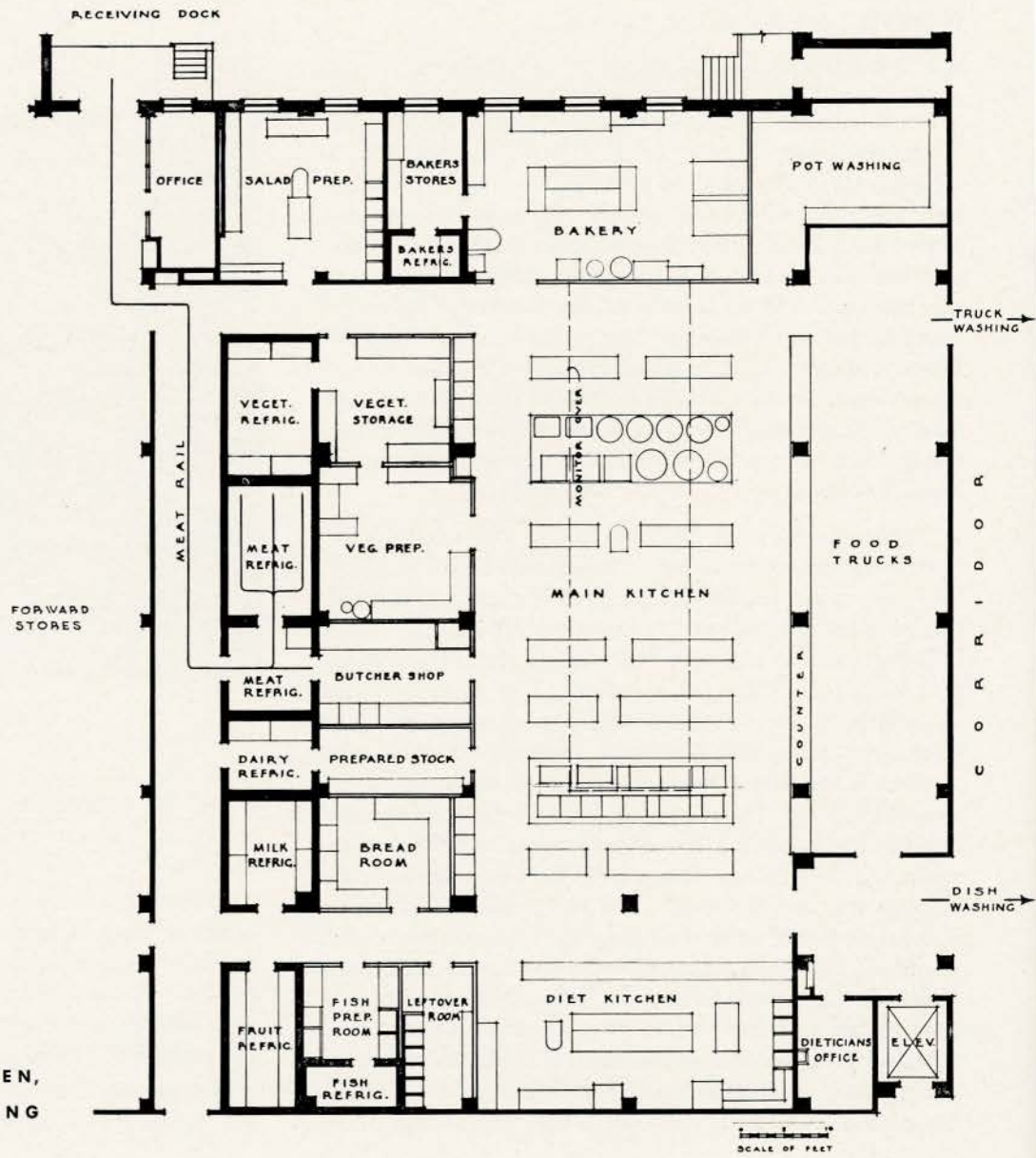
type. The four-sided monitor is single glazed and guttered and drained for condensation. Illumination generally, is by means of suspended, enclosed incandescent fixtures.

Particular attention was given to the collection of cooking vapours in the heart of the Kitchen. Overhead hoods were detailed over the banks of ranges and steam kettles. These hoods, stainless steel faced with flush light fixtures, discharge into a masonry stack terminating at a point well above the main roof level.

Distribution of prepared foods to Serveries throughout the buildings is by means of insert-type electrically

Photograph by Warner Bros.

MAIN KITCHEN



MAIN KITCHEN,
UP-PATIENTS' BUILDING

heated trucks. Individual Serveries are so located as to best serve single or grouped ward units. Such rooms provide Truck plug-in space, tray storage racks, working counter-tops double compartment sinks and cupboard units heated where necessary. Floors and bases are Terrazzo, walls glazed tile and plaster. Working surfaces and cupboards are stainless steel.

In ward areas, Dish-Washing centres are established at Basement level directly below the Serveries, thus eliminating attendant noise and confusion. Soiled dishes are transported by truck and service elevator to such rooms, cleaned and returned to the Servery to await the next meal. Such areas are provided with complete dish-washing equipment. Garbage is collected and trucked at Basement Floor level to the Incinerator located at the Boiler House.

In certain instances, small Kitchens or Kitchenettes, designed to perform a limited task, were considered necessary. The Out-Patients' Extension houses a small Cafeteria with its own self-contained Kitchen. Individual Floor Kitchenettes designed for "off-duty" snacks are provided in the Nurses' Residence.

Such Kitchens are, of course, comparatively minor. The main Kitchen with its gleaming equipment and energetic staff remains the basic heart of Food Service at Sunnybrook.

RECREATIONAL

By GORDON FOWLER

SUNNYBROOK Hospital is in itself virtually a small town and enjoys within its own limits all the indoor and outdoor recreational areas normal to any thriving Canadian community. It was obvious that many of the patients physically incapable of travel elsewhere would be able to enjoy facilities provided within the hospital areas. Moreover the fact that the site was located some distance from the heart of the city made it essential that careful study should be given to the providing of entertainment for patients and staff alike.

Sunnybrook Park provides a magnificent natural setting for outdoor recreation. A mere stone's throw from many of the buildings, the entrance to the valley road invites the pedestrian to the fine rolling park lands. To the south-east, an extensive level plateau has been preserved for playing fields. Here are being developed soccer and rugby areas; tennis courts and baseball diamonds. Here also are located the vegetable gardens planned and cared for by the patients.

Adjacent to the main Gateway the Bowling Green has for some time been a popular summer area with Patient and Visitor alike.

Many of the Indoor Recreational areas have been developed in the Up-Patients' Building. This unit forming the hub of the development was designed to receive 250 Ambulatory Patients. It seemed logical, therefore, that all or many of the Indoor Recreational areas should be easily accessible to this active group of Patients, and the First Floor was developed primarily as a social centre. In addition to the main Patients' Dining Room, it includes a Sun Room, Billiard Room, Card Rooms, Writing Room and Canteen. The Patients' Library containing 5,000 volumes is conveniently located on this same First Floor level in the adjacent Active Treatment Building. Located on the lower Ground Floor is the Auditorium and nearby four Bowling Alleys.

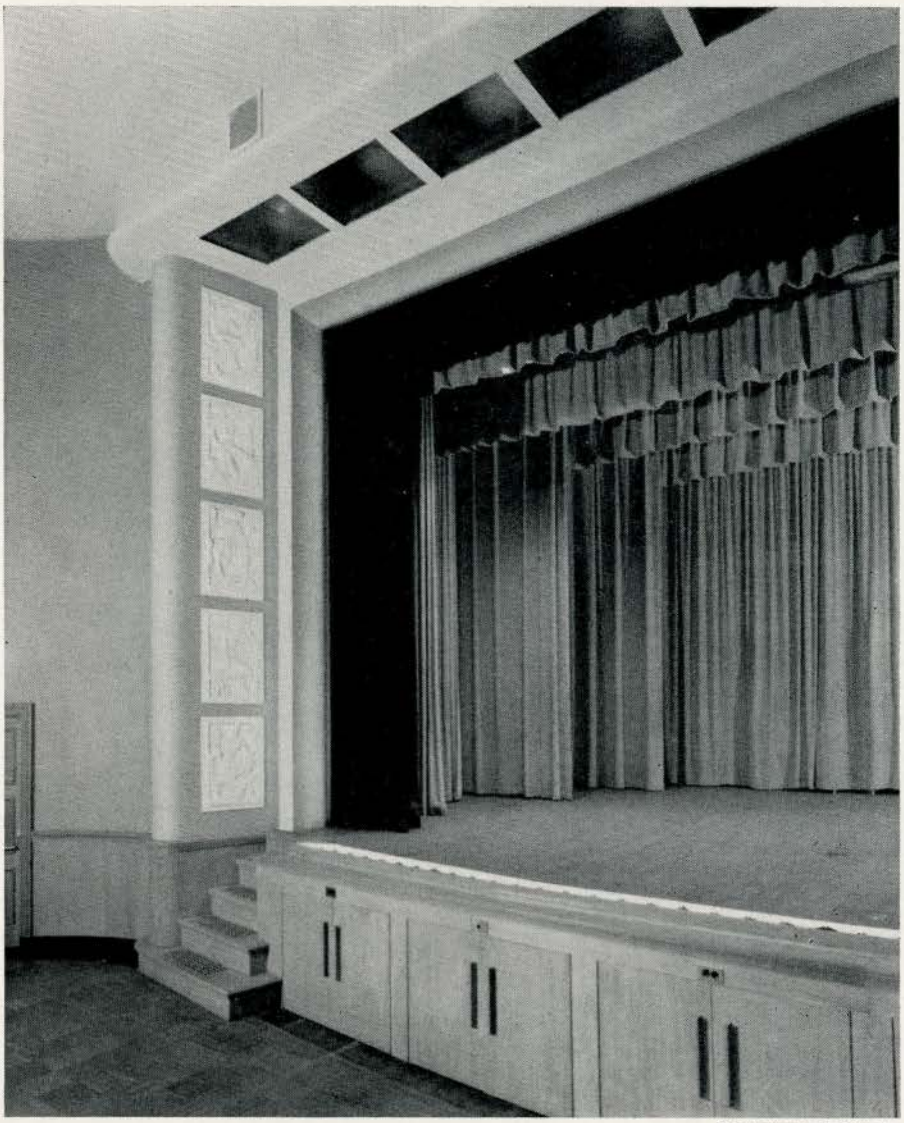
Generally speaking, finishes are simple and easily maintained – acoustic tile ceilings, painted walls, patterned linoleum Floors and terrazzo bases. Murals provide interesting wall decoration in the Card and Writing Rooms as well as the Visitors' Waiting Room in the Active Treatment Building.

PATIENTS' LIBRARY. ACTIVE TREATMENT BUILDING

Architecturally, the Auditorium is probably the most interesting single unit designed for recreation. It is of major importance in the daily life of Patients and Staff. It is rectangular in shape 55′ x 110′ with a 22′ ceiling height. It is intended for the showing of not only motion pictures, but also for the effective presentation of dances, plays, concerts, etc. It is provided, therefore, with suitable Stage and Dressing Room facilities and has a level floor. The use of 16 mm. film permitted chairs to be removable. The walls are hung with stretched fabric between oak covered pilasters. Acoustic materials are concealed behind the fabric wall covering. The major portion of the ceiling is broken into a series of coves running the width of the room. Lighting is provided both from direct Troffer units and by indirect lighting within the cove. Lamps are cold cathode and the indirect portion of such ceiling lighting is controlled by a "dimmer" switchboard.

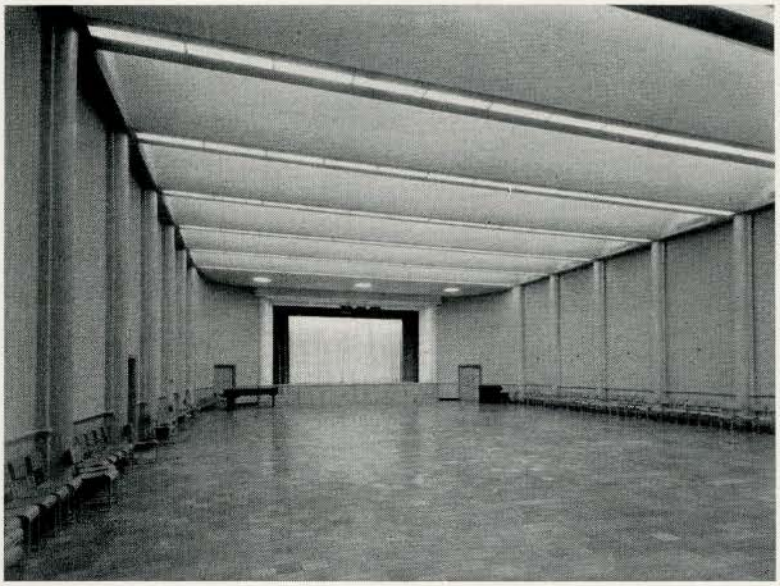
Photograph by Panda

MUSIC ROOM



AUDITORIUM STAGE

Photograph by Panda



AUDITORIUM, UP-PATIENTS' BUILDING

AUDITORIUM FOYER

Photographs by Warner Bros.

MAIN ENTRANCE LOBBY,
ACTIVE TREATMENT BUILDING

WRITING ROOM

Photographs by Panda

GAMES ROOM

TYPICAL STAIR

Photograph by Panda

TYPICAL DAY ROOM

PATIENTS' LIBRARY, SUNROOM

VISITORS' WAITING ROOM,
ACTIVE TREATMENT BUILDING

DEVELOPMENT OF THE PROGRAMME IN THE FIELD

By **DOUGLAS E. CATTO**

DUE to the size and complexity of the various units and the fact that each section was being built under a separate contract, it was essential that each section be regarded as a separate entity as far as responsibility for lay-out, execution of the work, supervision and inspection, accounts, payments, etc. were concerned. For these reasons, the Architects' field and office forces worked as groups and the contractor's engineering staff was similarly divided. In order to tie these groups together and ensure that the maximum effort was being directed to the most essential task, there was an overriding supervision and liaison group in both the Architects' and Contractor's organization which, by close co-operation between themselves and the Hospital authorities, ensured that the various stages of construction were arrived at in such a manner and at such times as would most nearly coincide with the requirements of the Department of Veterans' Affairs organization and the needs of the patients.

In order to simplify and co-ordinate all efforts, it was definitely established that all inquiries to the Architects' Office, whether from the Architects' field forces or from the Contractor's organization, were to be divided roughly into three categories, namely: financial; drawings; materials and construction; and one person in the office was designated as being responsible for receiving each type of inquiry and obtaining the answers. There was, of necessity, considerable liaison required between these persons, the heads of the firm, the consulting Structural and Mechanical Engineers, and the Hospital authorities; but it was found in practice that, although certain overlapping might occur, there was, as a result of this system, a very complete knowledge of the progress and condition, not only of the building, but also of the drawings, details, shop drawings, etc., readily available when required.

The Architects' actual field forces consisted of Architectural Clerks-of-Works who were each responsible for a certain building or buildings, and also a Mechanical Clerk-of-Works who was responsible for the Mechanical and Electrical work in all buildings.

Each Clerk-of-Works had his own separate office and plan room and had no contact with, or responsibility for, any buildings other than those directly under his control. This segregation was practically duplicated in the contractor's forces as regards lay-out men, superintendents and expediters; each one being responsible for his own duties in a particular building or buildings. This procedure proved very advantageous in that it resulted in clear cut lines of communication and responsibility and there was no divided authority in spite of the fact that at one period there were ten buildings in various stages of construction covered by four contracts and supervised by three Clerks-of-Works.

Due to the fact that there were separate contracts for the various groups of buildings, it developed that there were different groups of sub-contractors for each contract or in some cases, for each building in the one contract. Here again the definite divisions of authority and responsibility helped to prevent misunderstanding or dual control which might easily have developed, due to the fact that materials, finishes, fittings, fixtures, etc. were not necessarily the same in the various buildings.

In order that one building or contract would not benefit at the expense of its neighbor and to ensure that availability of space would be in the sequence required by the Owner, it was the responsibility of the head of the Architects' Field Forces to maintain a very close contact not only with the contractor but also with the Owner; as, once a decision as to time and occupancy had been arrived at, it was absolutely essential that it be met, particularly due to the fact that the Owner had not only a large problem as to furniture, furnishings, and equipment, but also Surgical, Medical, Nursing, Laboratory, Dietetic, Cleaning and Maintenance staffs to set up and have operating before it was possible to accommodate patients.

One example of this was the Up-Patients' Building. In this case, all the kitchen and basement accommodation, together with temporary office space for Administration on the ground floor was made available along with patient space in the Neuro-Psychiatric Building. The remainder of the Up-Patients' building was then completed and at the same time the permanent administrative offices in the Active Treatment Building were made tenable, after which the Ground Floor of the Up-Patients' was finished for its final use.

Another case was the completion for one date of the whole of the interns' space on the eighth floor together with the Operating Room accommodation on the Seventh Floor, the laboratory space on the Ground Floor and all six stories of patient space in the easterly third of the Active Treatment Building. All these spaces were interrelated from a hospital operational standpoint and each one was useless without the others.

Similar conditions to the above were repeated to some extent in connection with the other buildings and it was only due to the wholehearted co-operation of the Contractor's forces and a very close liaison being maintained with them by the Architects that the Owners' varying requirements were able to be met with a reasonable degree of success and an altogether unreasonable harmony, the latter being attained primarily by the utmost co-operation and long suffering forebearance of the Hospital Staff.

All changes, whether structural, mechanical, architectural or the substitution of materials were passed through one person in the Architect's Office and a complete

record was kept by him regardless of whether any change in cost was or was not involved. Three special forms were used in this connection, namely: Record of Revision, Notice of Change and Change Order.

The Record of Revision was used when no financial adjustment was involved. The Notice of Change advised both Owner and Contractor of the detail involved in any contemplated change; the Change Order was issued after a financial adjustment had been submitted by the Contractor, checked by the Architect and approved by the Owner.

The information contained in the Record of Revision or the Notice of Change was, of course, prepared by such person within the Architects' or Engineers' organization who was in charge of that part of the work which was involved, but finally, the checking of all submissions from the Contractor, issuing of Records of Revision; Notices of Change and ultimately Change Orders, was done by the estimator and accountant in the Architect's Office.

While this system may appear cumbersome, it actually proved very effective in that the Owner, Architect and Contractor were constantly posted regarding all changes to the work and financial adjustments to the various contracts.

The accurate and equitable checking of all contractor's and sub-contractors' submissions was greatly facilitated by the fact that the specifications called for a most detailed breakdown of unit prices for all materials, worked and in place; items of equipment, fixtures, and fittings installed, and finishes applied. These schedules covered the work not only of the general contract but of all subcontractors participating in the work. The unit prices, due to fluctuating costs of material and labour, of necessity, varied from contract to contract but remained constant for the duration of the contract to which the particular breakdown applied. As a resul of the foregoing, the checking by the Architect, of any individual submission became in reality a quantity survey to which the predetermined unit prices automatically applied. In this way controversy as regards the settlement of adjustments was reduced to a minimum.

Early in the course of five years' contact between the Architect's field forces and those of the Contractor, it became apparent to each group that the other had at least some rudimentary knowledge of the so-called art of building, with the result that advice, or criticism, when offered constructively, was readily accepted and acted upon; a policy of mutual benefit to the Contractor and the Owner.

It is the hope of the Architects that time will prove the success of their efforts in the designing of the Hospital. It is demonstrable however, that the execution of the work is satisfactory. Perhaps as a measure of the magnitude of the effort of directing the work and ensuring satisfactory quality of construction and finish it may be of interest to note that it provides the Owner with some 933,000 sq. ft. of floor area in 14,250,000 cubic ft. of buildings. The enclosing walls and partitions of these buildings are constructed of 4,882,000 brick, 1,170,000 cu. ft. of hollow tile and 51,410 cu. ft. of cut stone.

The interior spaces of the buildings are finished with 383,680 sq. yards of plaster, all decorated; 45,762 sq. yards of linoleum, 218,652 sq. ft. of terrazzo floors, 35 miles of terrazzo base, and 450,000 sq. ft. of acoustic tile; and access to the various rooms is provided by 311 Hollow Metal doors and 3,847 wood doors in hollow metal frames.

In the foundations and superstructure frames of the project there is some 34,420 cu. yards of concrete and 12,350 tons of structural steel.

The buildings derive daylight from some 2,710 wood windows and 28,470 sq. ft. of metal sash; artificial light is provided by 8,500 fixtures which along with twenty-three elevators and other electrical equipment require some 1,000 miles of wire for the transmission of 1,500 K.W. of electric energy from the substation to 18 different electric systems throughout the buildings.

Vehicle and foot traffic is provided for by 29,600 sq. ft. of sidewalk and 36,000 sq. yds. of paving for roads and parking and 3¼ miles of curb.

It must be obvious from the above figures that the Contractors achieved a major accomplishment in the construction of Sunnybrook during a period in which all building operations were difficult and during a great part of which no priorities were enjoyed in the procurement of materials or labour. It is gratifying therefore to know that the liaison between the field operators and the Architects' office was well maintained and that the contractors were subjected to a minimum of delay by lack of information. Hence, early in the programme, there was built up a mutual confidence between the field forces of both the Architects and the Contractors, with unquestionable benefit to the progress and quality of the work throughout the whole programme.

STRUCTURAL FEATURES

By **CLARE D. CARRUTHERS**

SUNNYBROOK Hospital is the type of project that is an Engineer's dream. True, it is a dream that could have its nightmares. In this case none developed although there were a couple of close shaves. It was both an interesting and educational undertaking.

In choosing the type of structure to use in the various buildings several important factors were kept in mind.

(a) The availability of materials.

(b) The type of building and its use.

(c) The economic factor.

(d) The amount of repetition and re-use of formwork.

(e) The live loads to be carried.

(f) The type of ceiling below the floor.

Based on these factors it was decided that, in general, tin-pan concrete joists would be used for floors with ceilings directly under the floor, and concrete slabs in corridors which had hung ceilings. Over those areas which did not require ceilings, concrete slabs were used, for example, storage areas, pipe spaces, tunnels etc. Tin-pan concrete joists were chosen because of the repetitive nature of the structure and because it was spread over a large area. Under these conditions they were the most economical type of floor systems available. The pans can be re-used many times and they are comparatively easy to transport.

In general the joists were 8″ or 10″ deep with 2½″ slabs on top for floors and 2″ slabs for roofs. Table 1 shows in condensed form the type of structure used in each building.

There is one general exception to the information given in the table. Under Toilets and Utility Rooms Open Web Steel Joists, with a 2½″ slab over, were used with structural steel frames, and one-way slabs with shallow concrete beams with concrete frames. This made the installation of piping much easier.

Fig. No. 1 shows a partial typical cross-section of the majority of the buildings. It shows the location of the columns and beams across the building. It shows also the pipe tunnel. The footing elevations shown are those of the Active Treatment Building. In the buildings without foundation problems the outer footings were directly under the basement floor and the corridor columns directly under the tunnel floor.

Throughout the project non-burning materials were used for the structure and except for the upper part of the Boiler Room, the Orthopaedic and Surgical Appliances Building and the Laundry, all structures were of fire-resistive construction.

The decision of the type of structural frame was based on the following factors – the availability of materials, the type of building, and the relative cost. This decision was not made until just before the design was started.

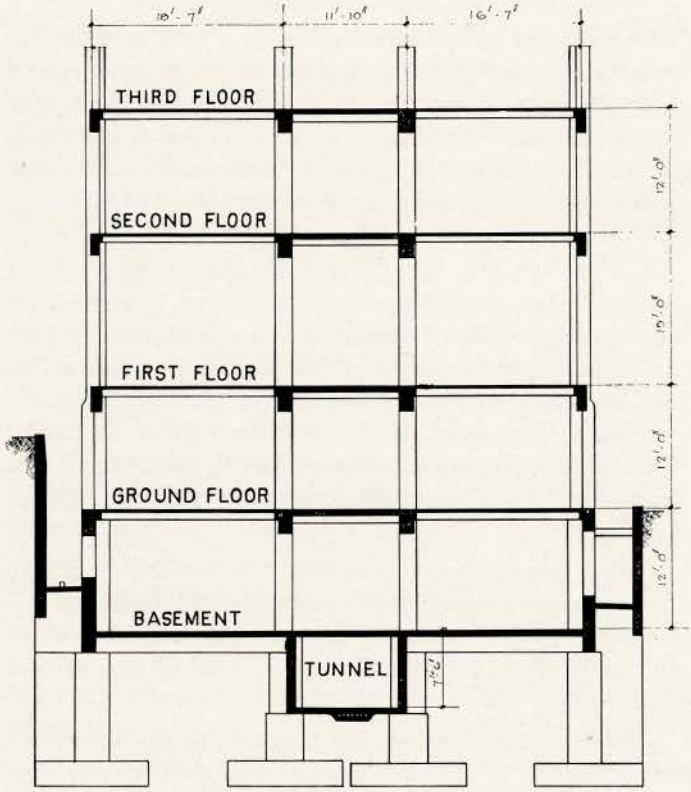


Fig. 1 — Cross section of buildings

During the period this project was under construction, there were wide variations in the availability of materials.

The live loads used throughout the project were based on the occupancy of the buildings. It was 50 pounds per square foot for all rooms, wards and corridors thereto, 75 pounds for Operating Rooms, Lecture Rooms and certain other special areas, 100 pounds in all Lounge Rooms, Dining Rooms, Kitchens, the Theatre, and in general the first floor of all main buildings. Special areas such as the Boiler Room, Orthopaedic and Surgical Appliances Building and Laundry had heavier live loads, 125 and 200 pounds per square foot. All floors were figured to take partition loads of the type used placed in any likely position. It was realized that there would be many changes from the original layout of the partitions. In any case, it is a wise provision to allow for partitions in any likely position.

In determining the column layout of the buildings every attempt was made to achieve a uniform and rational layout. This was not always possible but we believe we achieved a better layout than is generally the case in hospitals. Uniform spacing of columns can save many dollars in a project of this type and size. As far as possible, the spacing was set to allow the use of 12 x 20 concrete beams and 18 WF steel beams. This gave a spacing of 18 to 20 feet. It was particularly important that a maximum spacing of outer columns and

TABLE SHOWING TYPE OF STRUCTURE IN VARIOUS BUILDINGS

Building	Foundations	Lower Floor or Floors	Typical Floors	Roof
Boiler House	Concrete	Concrete Slabs		Steel frame, precast slabs
Sewage Tanks	Concrete	Concrete Beam and Slab		
Water Tank	Concrete	Concrete Flat Slab		
Orthopedic and Surgical Appliances Building.	Concrete	**Ground Floor** Concrete Beam and Slab		Steel frame, flat & sawtooth; precast slab
Laundry	Concrete	**Ground Floor** Concrete Beam and Slab		Steel frame, flat & sawtooth; precast slab
Psychiatric	Concrete	**Ground Floor** Concrete Beam and Slab	Concrete frame, terra cotta tile & concrete joist side bays — slabs in corridors	Same as Typical Floors
Up Patients'	Concrete	**Basement** Concrete Beam and Slab or Slab on earth	Steel frame tin pan concrete joist side bays — slabs in corridor	Same as Typical Floor. Over theatre precast concrete slabs.
Active Treatment	Concrete	**Basement** Concrete Beam and Slab	Steel frame tin pan concrete joist side bays — slabs in corridors	Same as Typical Floors
Out Patients'	Concrete	**Basement** Concrete Beam and Slab	Steel frame tin pan concrete joist side bays — slabs in corridors	Same as Typical Floors
Nurses' Residence	Concrete	**Basement** Concrete Beam and Slab	Concrete frame tin pan concrete joist side bays — slabs in corridor	Same as Typical Floors
Staff Residence	Concrete	Concrete Beam and Slab	Concrete frame tin pan concrete joist side bays — slabs in corridor	Same as Typical Floors
Out-Patients' Extension	Concrete	Concrete Beam and Slab	Concrete frame tin pan concrete joist side bays — slabs in corridor	Same as Typical Floors
Pool and Gym	Concrete	**Ground Floor** Concrete Beam and Slab		Steel frame, precast concrete slabs
Chapel	Concrete	**Ground Floor** Concrete Beam and Slab		Concrete slab & open web steel joist
Biological Building.	Concrete	Flat Concrete Beams and Concrete Slab		Same as floor

of spandrel beams be decided early since the distance from the finished floor to the top of the window was a constant almost throughout the project. It was based on 18″ WF steel beams.

There is no attempt in the descriptions, which follow, of the individual buildings to give their location. It is assumed that the reader will have read the Architect's story and will have given the plot plan considerable study. Nor will any attempt be made to give a detailed description of any of the buildings.

The first group of buildings undertaken were the Boiler House, Psychiatric and Up-Patients buildings and the connecting tunnels.

The Boiler House proper has concrete foundations and foundation walls, one way concrete slabs and beams at grade floor level. Above this concrete work there is a steel frame with precast lightweight concrete slabs for the roof. An overhead coal bunker is hung to the structural steel frame.

Fig. No. 2 shows the framing of the upper part. What

appears to be a deep girder running the full length of the building is the suspended coal bunker. This photograph gives an idea of the size of the chimney stack. It shows also a portion of the connecting tunnel from the Boiler House to the other buildings. This section runs under the Orthopaedic and Surgical Appliances Building.

Adjacent to the Boiler House were two large sewage storage tanks. They are of heavy concrete construction made tight against leakage of water in or out. The roofs

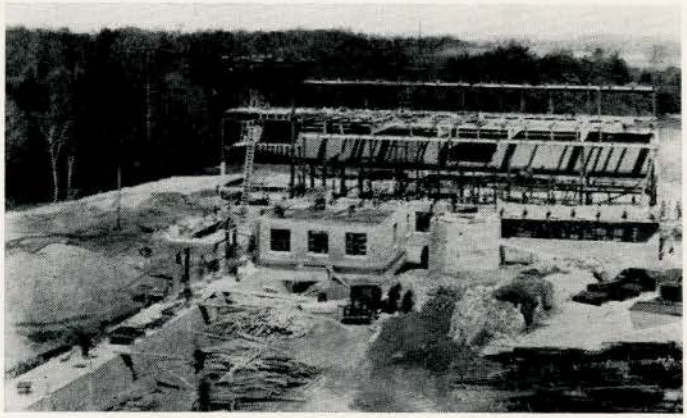


Fig. 2 — Boiler House

of these tanks were concrete one-way slab and beam. Just south of the Boiler House an emergency water storage tank was installed. It was of concrete construction with the floor and walls made tight against leakage. For the roof, which supported a coal pile, concrete flat slab or mushroom construction was used. For uniform column spacing and heavy loads concrete flat slab is a most economical type of construction.

The Psychiatric Unit is a three storey building. It has concrete foundations and foundation walls. The Ground Floor, which is over storage areas or pipe space, is one-way concrete slab and beams. The 1st, 2nd, 3rd Floors and Roof are of 8″ terra cotta concrete joist construction with 2½″ slab over. This type of construction was felt to be the most soundproof construction and the tile were more available than tin-pan at the time. It was the first building constructed. The frame was reinforced concrete of relatively simple type. A few slightly offset columns caused some difficulty due to the high shears. Such conditions are more difficult to handle in concrete than in structural steel. At the end of the south wing on each floor there is a sun room. Both for reasons of use and to give the structural engineers something out of the ordinary the columns were placed about 5′-0″ back from the corner on a 45 degree line. In concrete it was relatively easy to cantilever the slab and beams out to support the exterior walls which are largely glass. Cantilevers in concrete are comparatively easy.

Fig. No. 3 — shows the frame of the building before the roof and penthouses had been constructed. It is taken

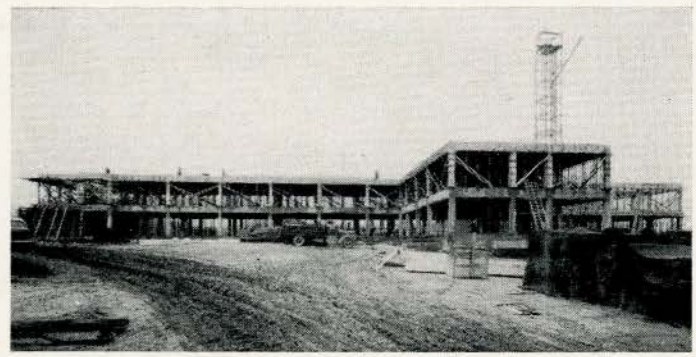


Fig. 3 — Psychiatric Building

looking at the east side of the building. The construction of the sun rooms is not very clear in this picture. A clearer view of the same construction can be seen in the picture of the Nurses Residence Fig. No. 9.

The Up-Patients building was the first building designed that could be considered typical of the type of construction used throughout the greater portion of the project. This building has the kitchens, dining rooms, lecture rooms, lounges, and a theatre. Since there were many rooms with relatively long spans, and many offset columns, it was decided to use a structural steel frame. There was considerable concrete work in the foundations which allowed time for the delivery of the structural steel. The tin-pan concrete joists were supported on the steel beams with hangers made of square bars, hooked, welded to steel beams at each joist.

The greater part of the building was standard beam and column construction. Over the theatre steel trusses supporting steel purlins and light-weight precast concrete roof slabs were used. The type of ceiling used did not allow the use of bottom chord bracing. Knee-braced trussed purlins with diagonal top chord bracing of steel angles was used. The ceiling was hung from the roof purlins.

At the end of the south wings there are sun rooms similar to the Psychiatric Building. In this case the columns and beams were of steel with concrete spandrels hung from the end of the steel beams. To cantilever the beam through the column the column web was slotted horizontally, a steel plate was put through this slot and welded in place in the shop. In the field the beams were attached to the plate and to the column by riveting. The columns were fireproofed to a circular shape using terra cotta tile.

Throughout this building and the other steel frame buildings the steel frame was fireproofed with terra cotta tile except for the tie beams between corridor and exterior columns. These were kept to a depth of 6″ and fireproofed with concrete. This kept them within the depth of the floor construction. Reinforcing bars were added each side of the beam to bring the strength of these beams up to that of the adjoining floor system. These small tie beams were a bit of a problem in erection

of steel work due to their lack of stiffness before encasement but were worth the trouble in order to achieve the long runs of level ceiling.

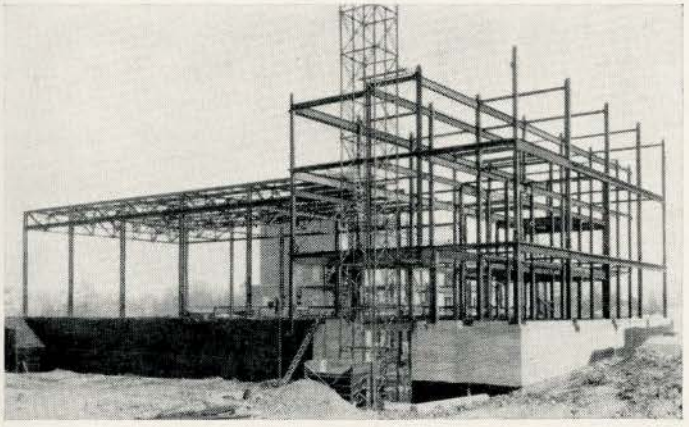


Fig. 4 — Up-Patients' Building

Fig. No. 4 — shows the general type of framing of the Up-Patients' building. It is taken from the north side. It shows at the lefthand side the framing over the theatre. If your eyes are really good you can see the trussed purlins with their knee-braces to the bottom chord.

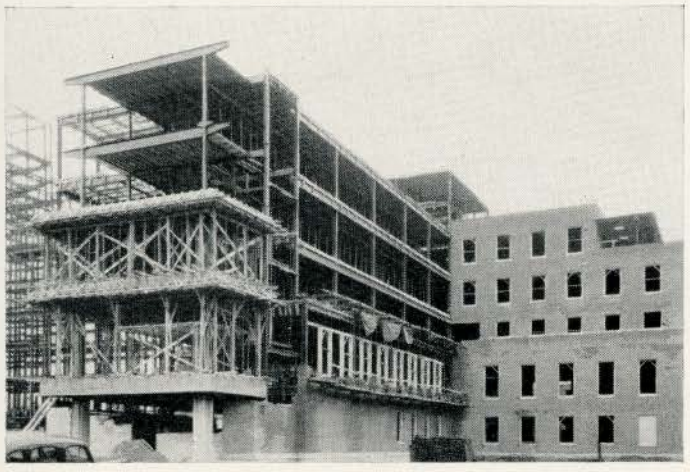


Fig. 5 — Up-Patients' Building

Fig. No. 5 — is a view of the south end. It is given to show the framing of the sun rooms described above.

The next design bite (and it was the biggest) was the Active Treatment and Out-Patients' Buildings. These two buildings were rushed a little. The design of the structural steel, about 3,000 tons, was made and put on drawings for ordering purposes in a period of less than six weeks. Getting around the problems due to this rush, getting the steel work to agree with the completed Architectural drawings took another six to eight months. The rush was necessary to take advantage of an opportunity to save many months on the delivery of structural steel.

The Active Treatment Building is the largest unit. It is shaped like a letter E. The back of the E forms an east and west wing 496 feet long. The prongs of the E are wings running south 150 feet from the east and west wing. In height it is the equivalent of a 10 storey building with a basement, and a tunnel under the center of the basement. This shape of a building requires little wind bracing even with its height. Only the south ends of the wings running south had any wind bracing. It was installed in the form of steel diagonal straps in one wall of the south end stair wells.

The type of construction used in the superstructure was the same as in the Up-Patients' building. There were a number of features that are worthy of mention. Near the top of the clock tower a large water tank was installed on a 9″ reinforced concrete slab on heavy steel framing. The upper columns of this tower were offset back on a 45 degree line. To support these a pair of I beams were run diagonally between the spandrels. Near the top of this same tower there is an interesting concrete platform cantilevered out from a floor slab. If this were in the Near-East it would in all probability be used by the Muezzin. In this part of the world it is probably only ornamental. It was an interesting structural problem.

In order to speed the erection of the structural steel the walls were backfilled to allow a reasonably close approach of the cranes before the basement floor slab was poured. Pockets were left near the bottom of the walls for the future basement concrete beams and a slot for the basement floor slab. In each pocket hanger bars were dropped down from the wall above. Dowels were placed in the slot for floor slabs. All walls were, of course, carefully shored. While this scheme was reasonably successful in this case, it is not one that can be recommended very often.

In the erection of the structural steel an idea new to this part of Canada was introduced. The columns, instead of being erected in the usual two or three storey tiers, were erected in four or six storey tiers, tied together at the top and the intermediate members filled in. A crane with a particularly long boom allowed this procedure.

In attempting to line up the continuous spandrel angles on the beams with the brickwork a good deal of trouble was experienced. This was due partly to the wide tolerance in the rolling of structural steel allowed during the war, partly to the deflection of the beams, but in the main to the long lengths of wall. It was decided finally to have the spandrel angles connected to the beams loosely until the brickwork reached that level. Then the mason and the structural steel men worked together to set the angles at the proper location and bolt securely to the beam.

The real problem on this building was the foundations. One of the first things done on the Sunnybrook project was the taking of a series of borings to determine the soil conditions on the site. These were made at 150 to 200 foot centers, on the east and west axis of the main line of the buildings with additional holes to take care

of the buildings off line. These borings indicated three main types of soil, all hard packed as far as the borings would indicate. Under the top soil was hard packed sand of medium size in beds of varying thickness. Below this was a yellow clay and sand mixture which varied in thickness of its bed and sometimes changed to pure sand. Below these two types of material was a hard blue clay. The borings were 2″ dry augur borings, the most of which were carried to the blue clay. Visual examination of the samples was made in the field. In addition a written report and bottled samples were made by the driller. No free water was encountered in any of the holes except one. This was to the south of the Up-Patients' Building, near the crest of the ravine and outside the general building area.

The excavation of all the buildings to the east of the Active Treatment had been free of ground water and in the main into the hard blue clay. When the excavation for the Active Treatment had been taken down to just below the basement floor level large quantities of water were encountered. In addition the center west section of the Up-Patients' which had been excavated for some time and which had been dry suddenly developed springs. Water bubbled up through a layer of clay 12″ to 18″ in thickness. It would appear that in excavating for the Active Treatment Building an underground stream running through a lense of sand, possibly encased in clay, had been broken into and allowed the water to permeate through the adjacent sand.

Whether more borings, deeper borings, or a different type of boring would have discovered this condition is hard to say. Finding unusual conditions such as described requires a bit of luck. Or possibly we should have used a water-diviner with his forked stick.

It was not considered desirable to put the foundations of this large building on a wet sand which is hard to work in without loosening. Therefore, the foundations of the east-west wing of the Active Treatment and of part of the Up-Patients' were carried down to the hard blue clay which was about 6 feet below the bottom of the main pipe tunnel. This required dropping the interior footing approximately 3 feet. The exterior footings were dropped 10 feet to 12 feet. See cross section Fig. 1.

Several methods of installing the footings were considered. Finally it was decided to excavate the whole area to the clay, install the footings and piers up to just below the basement floor, and then backfill with the excavated sand. The lowest floor was not made a slab on earth but became a framed slab which was poured into pockets and slots in the walls as noted earlier. The walls were carried down about 2′-0″ below the Basement Floor. To take care of most of the water a trench was dug and a drain installed from the excavation to the ravine on the south edge of the property. This ran like a small creek. The remainder of the water was handled by pumping. To ensure that the water would not cause trouble later in the basement and the tunnel two large sumps were built and connected to the drain to the ravine. This formed a permanent drainage system.

The south wings of this building did not have any basement. The footings were well above the water level on hard packed sand. They were not taken down. At the junction of these wings with the east-west wing steel sheet piling was driven to insure no slippage of the earth. The footings were stepped down with a slope between them of 45 degrees.

The foundations for this area were a difficult problem for all concerned. No other building had any complications. There has been no sign of any cracking that could be attributed to unequal settlements.

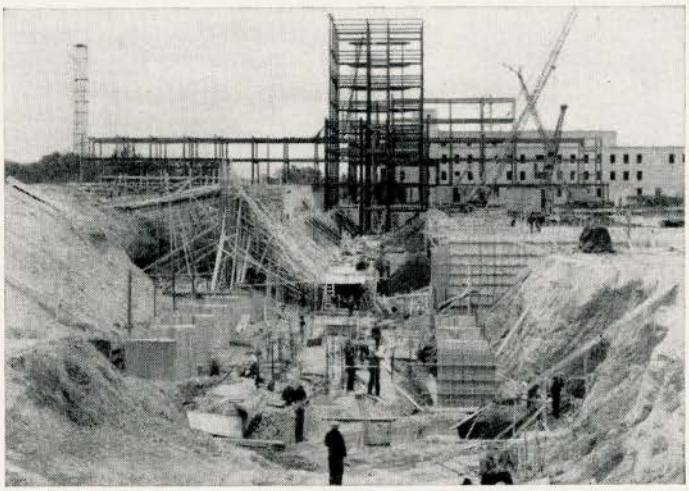


Fig. 6 — Out-Patients' Building and Active Treatment

Fig. No. 6 — is a photograph taken from the west and gives an idea of the depth of the foundation work on the Active Treatment Building. The service tunnel shows in the center of the photograph. It runs practically from end to end of the project. The structural steel erection was about half completed. The long boom of the crane may be seen very plainly. Note that no floor slabs have been constructed but all walls have been well shored.

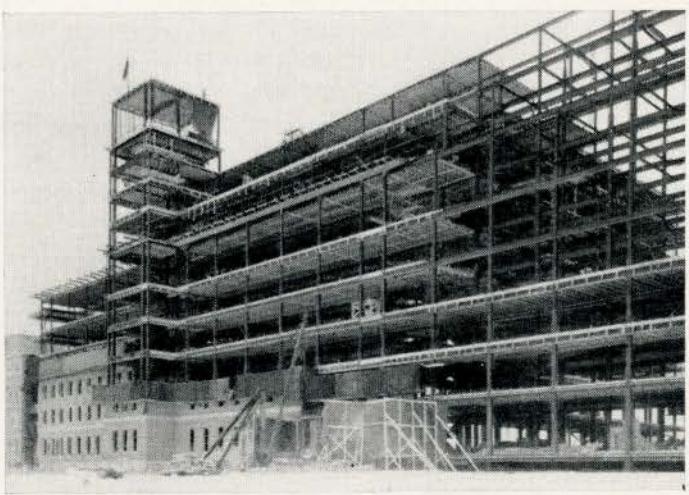


Fig. 7 — Active Treatment Steelwork

Fig. No. 7 — was a photograph taken about the time the steel work was completed. It gives an excellent view of the project, its height and extent.

The Out-Patients' Building was similar to the Active Treatment in its construction but much smaller and without as much foundation trouble.

The next units designed were the Orthopaedic and Surgical Appliances Building, generally referred to as the O. & S.A. and the Laundry. The structure was of the factory or storage building type. There was a slab on ground, a framed floor of two-way slab and concrete beam construction. The roof was precast lightweight concrete slabs on a structural steel frame. The greater part of this roof was of sawtooth type construction. The Laundry had concrete foundation and foundation walls with a steel superstructure to frame the mezzanine floors and roof. Precast lightweight concrete slabs were used for the roof and poured in place slabs for the floors. The roof had a large double sawtooth. Special care was taken in the structure of this building to avoid dirt pockets and ledges.

Fig. 8 — Orthopaedic and Surgical Appliances Building

Fig. No. 8 — shows the types of structure used on the O. & S.A. Unfortunately, there is no good picture of the laundry during the construction period.

The Out-Patients' Extension, the Nurses' Residence and the Staff Residence are three units that were built about the same time and are of the same type of construction. The floors are of either one-way slab or tin-pan concrete joist on a concrete frame. It was felt that a concrete frame would be more economical for several reasons: (1) There were considerable areas of these buildings that did not require finish, (concrete beams and columns do not require any applied finish in such a case). (2) The structural steel supply situation was not of the best. (3) There were considerable quantities of form material on the site.

These buildings were standard type of beam and column framing without many outstanding structural features. One interesting feature in the Out-Patients' Extension was the cantilevering of the end of the south wing 10 feet over the service and pipe tunnel. The footings were placed at the level of the bottom of the tunnel, and the foundation walls used as cantilever beams over the top of the tunnel. In the Nurses' Residence a pair of beams was placed at each floor at the end of the common rooms to support fireplaces and allow the flues to run up between them to the chimney above.

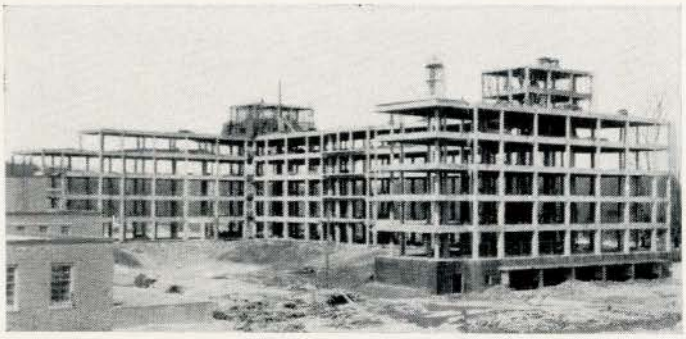


Fig. 9 — Nurses' Residence

Fig. No. 9 — is an excellent photograph of the structural frame of the Nurses' Residence. The Out-Patients' Building and the Staff Residence are similar but smaller. The framing of the Day Rooms in concrete can be clearly seen at the left end of the wing in the foreground. This is an unusual photograph since no masonry has been started and the frame is practically complete. It takes a bricklayers' strike to produce this condition.

The other buildings which are still under construction, are the Pool and Gym, the Chapel and Formal Gardens, and Biological Building.

The Pool and Gym Building was placed between two of the southerly wings of the Active Treatment Building. This is a one storey building with part basement. It has concrete foundation walls, a steel frame on bearing walls, and lightweight precast concrete roof slabs. The only structural feature of interest on this building was the use of concrete caissons under the walls adjacent to the Active Treatment Building. Since the foundations of the Active Treatment Building in the east and west wing as previously noted had been carried to a low level it was necessary to take any adjoining footings to the same level. Close sheathing was driven down and the earth excavated. When the proper level had been reached concrete was poured in for a depth of 8 to 10 feet. Concrete columns were then carried up to the underside of the foundation walls which acted as beams between caissons and between caissons and the soil at the upper level well away from the Active Treatment Building.

The foundations of the Chapel and of the walls of the Formal Gardens had some interesting problems. The main sewers and water lines were run along the north side of the Up-Patients' Building which is directly south of the Chapel. It was necessary to carry some of the new foundations down through this nest of piping. It required considerable ingenuity to miss all obstructions and still get the required area of footings properly placed.

(Continued on page 361)

MECHANICAL SERVICES

By **H. H. ANGUS AND ASSOCIATES LIMITED AND R. P. ALLSOP**

BEFORE detail work was started on the mechanical plans for Sunnybrook Hospital many conferences were held with the Architects and many preliminary drawings and reports made to select a proper location for the power house and proper distribution system for heat, water, sewers and electric current. Fortunately future developments were considered at that time which proved a wise move because it has been found that the buildings when constructed have fitted into the general scheme and it has never been necessary to shift any underground mains or other piping to accommodate buildings. As the original group was started in 1944 it is a tribute to the Architects that they were able at that time to present a fairly clear picture of what is now being built five years later.

The location of the power house being settled and the general scheme of distribution agreed on for all the mechanical and electrical trades involved, it became a question of detail study to produce the mechanical plans.

The general scheme consisted of a power house designed to house mechanical equipment and be the centre of distribution for heat steam, water, sewage and electric lines. The design of water supply, sewage, electric distribution and refrigeration are dealt with later in this article.

The power plant building was designed around the equipment to be housed and at the same time designed to present a neat attractive appearance and we believe this has been accomplished.

Coal is delivered to the site by trucks which pass over a scale where the coal is weighed and discharged into an underground hopper. It is conveyed from this mechanically into an overhead hopper holding about 350 tons. From gates in the bottom of the overhead hopper the coal passes into a travelling weigh lorry. This lorry carries it to the boiler requiring coal and discharges it into the stoker hopper.

Coal can be taken from any part of the storage hopper and weighed and fed into any boiler so that any boiler can be operated provided there is coal in any part of the hopper. The hopper provides a supply of coal sufficient to operate the plant for about a week in normal winter weather.

There is a basement section under the boiler room in which is located the ash removal system, air ducts for forced draft fans, blow-off tank and a considerable amount of piping.

The ashes from the boilers are discharged into a storage pit under each boiler and are conveyed from there by a vacuumatic type of conveyor to an overhead bin close to the coal receiving hopper. Trucks drive under chutes from this bin and receive their loads of ashes.

There are three boilers or steam generators each having capacity to produce 30,000 pounds of steam per hour at about 135 pounds pressure. Two of these boilers will carry the present full load in the coldest weather leaving the third as a spare. Space has been left for a future boiler.

The boilers have furnaces completely enclosed by water walls so they require no enclosing brick work. This type of boiler is economical to operate and requires no costly repairs to the brick setting. The boilers are fitted with steam driven underfeed stokers and are equipped with a complete system of automatic control so that their operation is as nearly automatic as possible.

Steam from the boilers is used in the converters which supply hot water to heat the buildings, also to heat the air in the ventilating systems of the different buildings. It is also used in the laundry, kitchens, sterilizers, etc.

All condensate is returned to the boiler room into a large tank from which it is pumped through heaters back into the boilers.

The boiler feed pumps are steam turbine driven centrifugal type. There is one small one intended for summer use and duplicate pumps for winter use. Steam turbine driven centrifugal pumps are also used for circulating the hot water for the heating system and each of these has a capacity of 3,500 imperial gallons per minute. The exhaust steam from the circulating pumps is used in the converters which heat the water for the heating system. Exhaust from the boiler feed pumps and other steam turbine driven units is used in the feed water heater to heat the boiler feed water. In the engineer's office there is a large steel panel on which is mounted recording and other meters and instruments so that the engineer can keep accurate records of operation.

In the power house in addition to the boilers and their auxiliary equipment there is the sewage tank and pumps, an emergency steam generator to automatically supply electric power in case of power failure, a steam driven fire pump and an incinerator.

From the power house basement there is a pipe tunnel running under the main corridor and connecting the various buildings. The main steam and hot water heating lines are run in this tunnel. At convenient points along it branches are taken off the mains and run to distribution or equipment rooms. In these rooms are located valves, pumps, headers, etc. so that branch distribution can be made from these points. This pipe tunnel has proven very useful as repairs, changes etc. can be made to lines without interfering with the corridor above which is used as a service tunnel.

The incinerator is located in the power house basement. Trucks conveying the garbage are wheeled along the service corridor and in the garbage room the cans

are emptied by chutes into the incinerator below. The cans are then washed and sterilized and stored ready to be taken back to kitchens, wards, etc. The smoke flue from the incinerator is connected to the main chimney.

The hospital is heated by forced hot water. The converters and pumps to do this are located in the power house. The large pipes in the tunnel carry this heated water to the equipment rooms in the various buildings from which the branch mains start.

The convectors are all set flush with the walls and the radiator fronts were designed specially for the job and arranged so that the fronts can be easily removed for cleaning the radiator elements. To improve the appearance of the rooms, convector fronts and cabinets were made in uniform length, generally the width of the window. The heating elements of the convectors which are not visible from the room are of course made to supply the heat required for the radiator locations. All convectors are fitted with dampers so the heat output can be easily regulated. The water temperature on this job runs up to 220°F. in the coldest weather so the amount of radiation required for heating is not very much more than if steam were used. The temperature of water is controlled automatically from the outside temperature. In certain sections of the hospital unit heaters are used for storage areas and similar location. In the operating rooms automatically controlled steam radiators are used so that these rooms can be supplied with heat when the main hot water heating system is shut off in the summer.

In general heating mains and steam distribution to sterilizers, serveries and similar rooms are run on the basement ceiling. The use of forced hot water allows radiators on the lower floors to be kept below the mains and therefore has eliminated a tremendous amount of pipe trenching in the floors. Steam is distributed at different pressures to suit the apparatus which it supplies. In general all piping is run concealed on the upper floors and access doors are located close to all valves. Due to the enormous size of the job valves have been used at many points so that sections of all piping can be isolated in case it is necessary to make repairs.

In the basement and pipe space pipes for the different systems have been clearly marked so the operator can clearly distinguish the different systems. All valves except those in sight of the apparatus they control are tagged with numbered brass tags and framed directories show what each valve controls.

There is a pipe space under the main kitchen in which all plumbing and steam pipes to the different pieces of apparatus are located. This allows the kitchen to be free of all overhead piping and also allows the operators to make repairs or changes without interfering with kitchen operation.

In the laundry filters, heaters, and main piping are placed in a space under the laundry.

There are a large number of separate ventilating systems in the buildings. In general patients' rooms up to four beds depend on window ventilation. Larger wards have exhaust ventilation by means of fans and the air supply comes in through the open windows. There are air supply and exhaust systems for kitchens, operating rooms and other similar rooms.

The active treatment building has more systems of ventilation than the other buildings. In general supply and exhaust fans are located in fan rooms placed near elevator penthouses. The air supply units consist of air filters and heating coils which are automatically controlled to heat the air to the required temperature. In the supply to the operating rooms there is also an electrostatic air filter so that the air to these rooms will be kept as pure as possible. All fans are mounted on sound deadening bases and air velocities have been kept reasonably low so as to make the ventilating systems quiet in operation. There is a completely air conditioned section in the fitting room of the artificial limb factory which maintains uniform conditions in this section at all seasons of the year so that limbs are adjusted and fitted always at the same temperature and can therefore be made more comfortable under ordinary conditions of use.

Refrigeration requirements are considerable and scattered in the various buildings. A study of the requirements showed that it would be more economical to locate machines close to the refrigerators, kitchens etc. than to have one central system for the whole group of buildings. All refrigeration is produced by electric driven refrigerating machines using Freon as a medium. In general plate type cooling units are used in small refrigerators and fan type cooling units are used in large storage rooms.

In general all mechanical work for this hospital was designed to provide the facilities necessary for the various sections of a hospital of this kind in an economical manner. First quality materials have been used throughout so as to keep the costs of replacements and repairs at a minimum.

Plumbing

The magnitude of the entire project and the urgency with which the buildings were required, necessitated the erection of the various buildings in several contracts which were let as the drawings for that particular section were completed.

The initial contract included the laying of the water supply mains, storm and sanitary sewers, etc., with provisions made at the required points for services to the individual buildings.

This made imperative a careful study of the various requirements involved for the ultimate project and also the establishing of the maximum drain elevation permissible from the various buildings.

As the buildings are located on a site falling from west to east and as no sanitary sewers were available at the east end of the property, it became necessary to pump all wastes to the sewer on Mount Pleasant Avenue.

In order that the pumping equipment would be under constant supervision, it was decided to grade all sanitary sewers back to the Boiler House, providing there, a sewage screen which could be readily cleaned and a sewage reservoir having a capacity of 250,000 Imperial Gallons. Three sewage pumps were installed, two electrically driven and the third steam turbine operated, each pump having a capacity of 350 Imperial Gallons per minute against a head of 125 feet.

The storm water drains from the buildings and roadways, etc., are connected together and carried to the creek at the south side of the property, the discharge being arranged through a concrete spillway to prevent erosion of the bank.

A 12" water main was brought in from Bayview Avenue fed from the North York Township mains, but a second pipe was carried to the street line from the Meter House in readiness for a future connection to the City of Toronto mains when this service becomes available.

The water pressure is sufficiently high to obviate the need for house pumps in all buildings except for the Active Treatment Building and in this case, a two compartment steel house tank, 22 feet in diameter and 13 feet high, is provided in the Tower, filled by house pumps located in the Basement. Three pumps were installed, two electrically driven and one steam turbine driven, each pump having a capacity of 75 Imperial Gallons per minute. This tank was arranged to feed down to the Fourth Floor level but street pressure was used for the lower floors.

Hot water for fixtures is generated in each of the buildings by means of steam convertors which are installed in duplicate, connected to a storage tank, and the piping arranged to make it possible to feed from the hot water tank, or, directly from either of the two convertors should trouble originate in the tank.

An extensive system of fire protection is provided with a cast iron ring main around the property with fire hydrants effectively located throughout the grounds. Fire hose cabinets with 1½" hose and CO2 or soda acid extinguishers, as required in each cabinet, have been placed throughout the buildings. In the Active Treatment Building the 1½" hose outlets are connected to the street main and also to the house tanks with check valves on the feed from the tanks. In addition, two dry standpipes are provided, connected to two outside Siamese fittings with 2½" outlets on each floor threaded for the City of Toronto's Fire Department Equipment.

The buried fire mains are arranged to encircle the group of buildings, the primary water service being taken from the 12" cold water main through a suitable system of gate and check valves. A fire pump is provided in the Boiler Room driven by both electric motor and steam turbine and having a capacity of 1,000 Imperial Gallons per minute, against a total head of 300 feet.

In the Laundry Building, Sodium Zeolite Softeners are provided and the hot water tanks and convertors arranged in duplicate. It was found essential to provide a large pneumatic cushion tank on the line to the washers as the quick acting fill line valves occasion excessive water hammer unless proper precautions are taken.

A great deal of care was exercised in the selection of the plumbing fixtures in an endeavour to facilitate maintenance duties and encourage cleanliness.

An interesting saline bath treatment apparatus was evolved based largely upon designs developed in England, where it had become apparent during the early stages of the War that properly controlled saline baths were very efficacious for the treatment of burns.

A well-equipped swimming pool is being constructed in the Therapeutic Pool and Gymnasium Building using a diatomaceous earth filter and complete with underwater vacuum cleaning and chlorination.

An extensive system of lawn sprinkling is provided in the grounds, all piping being carefully graded to buildings or manholes to assure drainage and consequent protection from frost. Piping is so designed and sizes arranged to simplify conversion to automatic sprinkling should it ever be desired.

A considerable amount of oxygen piping is provided running from the main cylinders to Operating and other special rooms with metering outlets located at convenient points. Vacuum piping is also carried to many locations with the vacuum-producing machines located in the Basement Equipment Rooms.

Vacuum type mop cleaning systems have been installed in most of the buildings with the vacuum machine located in the Basement and connected by a system of piping to the mop cleaner outlets which are located in the cleaners' closets on the various floors.

Electrical

Continuity of service is of primary importance for a building of this nature, and consequently every endeavour has been made to reduce the possibility of breakdown to a minimum. The primary service was brought in overhead by the Local Power Company at 26,400 volts and a frequency of 25 cycles. Three transformers were provided at the main Sub-Station to step this voltage down to 4,000 volts for distribution throughout the various buildings. It was decided to connect these transformers Delta-Delta so that in the event of one transformer failing, the remaining two would operate in open Delta with a reduced load. In designing the Sub-Station, all provisions have been made to facilitate the installation of an additional three transformers.

From this transformer Sub-Station, two duplicate 4,000 volt feeders are carried through the buildings under the tunnel floor in fibre ducts encased in concrete. Manholes were provided at all connecting points and wherever required to facilitate "pulling in".

Each building or section of the building, as the case may be, has its own unit type Sub-Station, consisting of three air-cooled transformers to reduce the 4,000 volts to 120/208 volt, 3 phase, 4 wire (Delta Y connected).

In each Sub-Station a 3 pole double throw disconnect switch was provided on the primary connection to the transformers and interlocked with a main air circuit breaker or "No-Fuz" breaker. The two 4,000 volt feeders were connected to this double throw disconnect switch so that, in the event of one feeder failing, the building Sub-Stations could readily be connected to the remaining standby feeder.

A frequency convertor was installed in the Sub-Station in the Out-Patients' Building to provide 60 cycle current for the X-ray Department. This convertor was connected to the 4,000 volt stand-by feeder to insure that at all times the feeder would be in operating condition.

All wiring and equipment in the Operating Rooms is of the explosion proof type fed by a 3 phase, 3 wire ungrounded system by means of an isolating transformer. This unit segregates all the wiring in the Operating Rooms from the balance of the building and also changes the current characteristics from 120/208 volt, 3 phase, 4 wire grounded to 115 volt, 3 phase, 3 wire ungrounded. All panelboards on this system are equipped with ground indicating lights.

The Emergency Lighting System consists of a steam-driven dynamo, generating power at 4,000 volts, 3 phase, 25 cycle, 3 wire, feeding a bank of three transformers to change the current characteristics to 120/208 volt, 3 phase, 4 wire. It was necessary to generate power at 4,000 volts because of the voltage drop which would accrue with low voltage feeders with the considerable length of run from the Power House to the load centre.

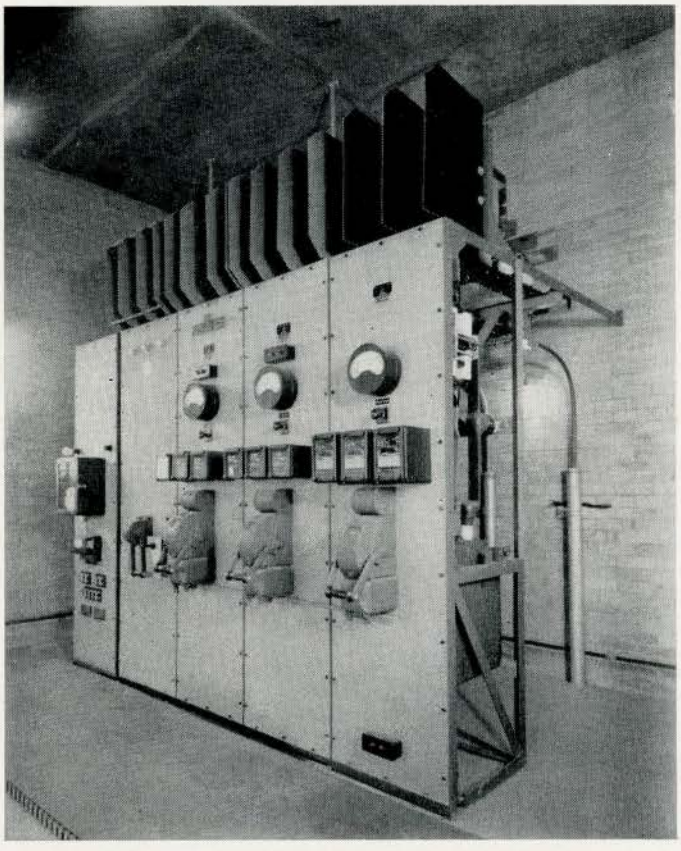
This bank of transformers feeds a system of emergency lighting throughout all the Corridors and Stair Wells in the patient-occupied portions of the buildings. This emergency system also takes care of the Operating Room lighting and one elevator used to service the Operating Room area.

Should the normal Hydro supply fail, the emergency generator is immediately started by the automatic opening of an electrically operated valve on the steam supply to the turbine. This generator feeds the emergency lighting system and by means of transfer switches the Operating Room lighting and the emergency elevator may be fed from this source.

This steam-driven generator also serves a dual purpose insofar as it is arranged to make it possible to carry some of the load during peak periods. This is accomplished by connecting the generator to No. 2 4,000 volt feeder through a double throw oil circuit breaker, enabling the staff to throw any desired building Sub-Station on to this feeder.

Power failure is indicated by a system of alarm bells and warning lights located at supervised stations.

The P. A. System enables programmes originating in the Auditorium, Chapel, Main Board Room, P. A. Room and Radio Broadcasting Studios, to be heard in any Ward throughout the Hospital. It is also possible to broadcast programmes originating from the Auditorium.



SWITCHBOARD AT MAIN TRANSFORMER STATION

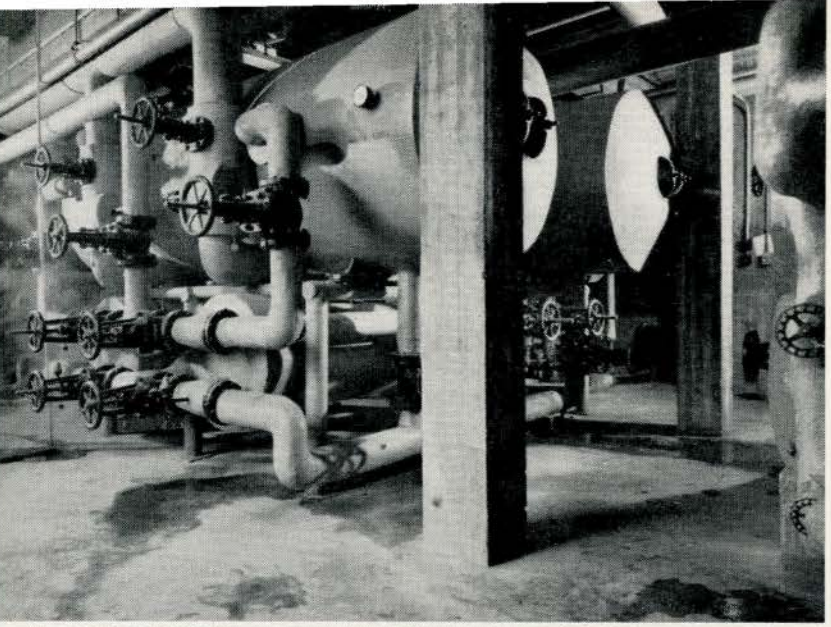
Generally, the lighting is accomplished by incandescent fixtures using totally enclosed semi-indirect glassware of design in keeping with the diversified requirements.

Lighting in the Auditorium is effected by means of Cold Cathode lighting arranged in coves and recessed panels, providing an intensity of approximately 5 ft. candles with the cove lighting and 10 ft. candles with the panel lighting, or a total of 15 ft. candles. Stage lighting consists of one row of footlights, one row of Proscenium Arch lighting and two rows of border lights. All the stage lighting and the cove lighting is controlled from a Dimmer Switchboard arranged to provide a wide range of intensities and effects. The Cold Cathode cove lighting may be dimmed to give an intensity of less than 1 ft. candle. Cold Cathode in coves is also used for decorative lighting in the Main Foyer. The switchboard is unique insofar as it is designed to satisfactorily dim Cold Cathode lighting.

A motor generator set in the O. & S.A. Building converts the 25 cycle supply to 60 cycle frequency for fluorescent lighting and certain appliances.

A great deal of investigation was carried out in connection with the Doctors' Paging System, both visual and audible systems, but in the end it was decided to install a visual type Doctors' Paging System with illuminated numbers.

A Doctors' "In and Out" System, including a panel with illuminated names located at Entrances to various



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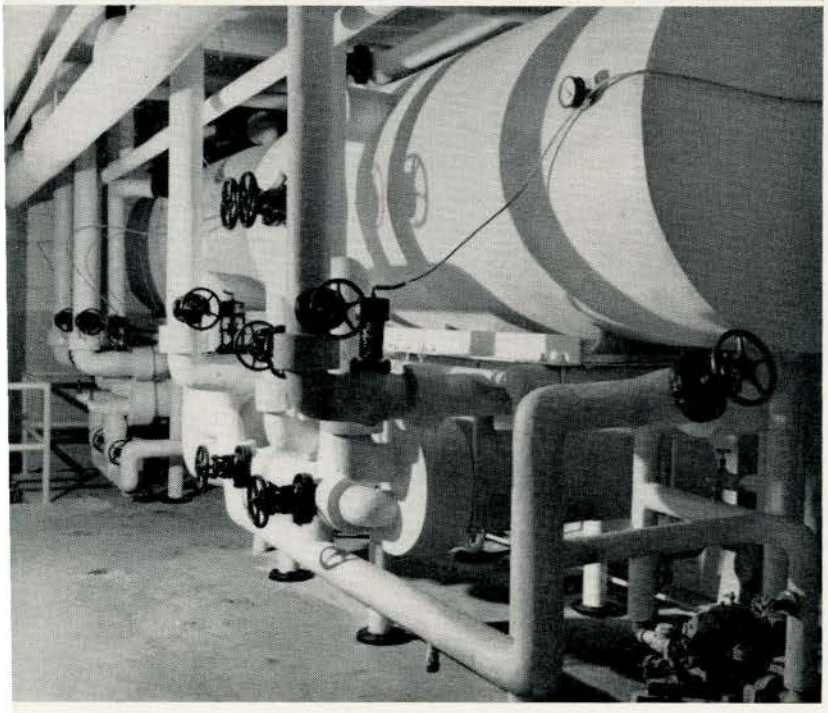

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buildings, enables the Telephone Switchboard Operator (by means of corresponding panels) to know if any Doctor is in the building. A flasher mechanism on these panels also enables the Switchboard Operator to notify a Doctor that he is required to call the switchboard either upon leaving or entering the building.

A Telautograph System provides a means of transmitting written messages between all Nurses' Stations, Dispensary, Telephone Switchboard, Admitting and Discharging Departments, etc.

In the Telephone Switchboard Room a special switchboard was installed to house the operating switches for the Doctors' "In and Out" and Doctors' Paging. This switchboard also houses a Telautograph Station and the switches for an Internes' Return Call System.

The Nurses' Call System in the Residence is in essence similar to that provided for the Internes.

The Operator by means of a switch located at the special switchboard notifies the occupant of any room (by both audible and visual signals) that he or she is required to call the switchboard. The occupant of the room indicates that he or she has received this signal by pushing a button which resets the visual indicator and also actuates a visual indicator in a panel in the Telephone Switchboard Room. The occupant of the room is then required to call the Switchboard Room from the nearest phone.

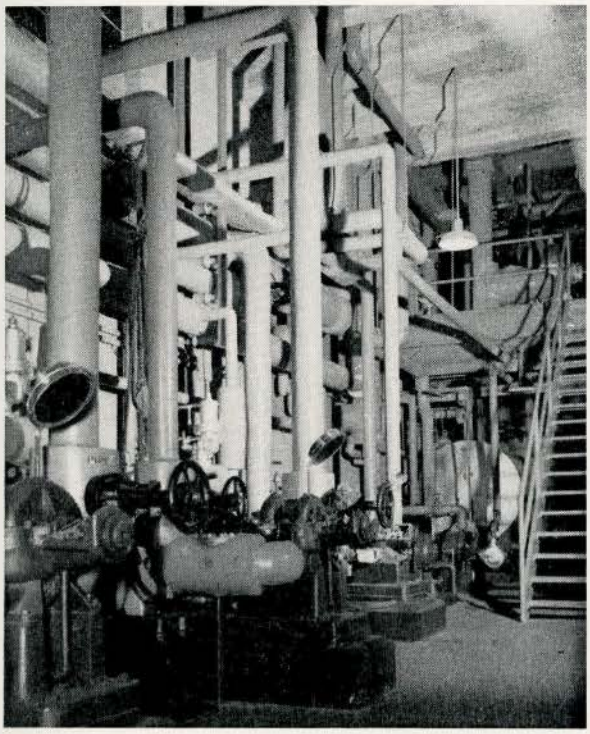
Fire Alarm System

The system provided for fire alarm consists of a supervised coded alarm with Fire Alarm Stations and chimes located generally at the Nurses' Stations.

In case of fire, anyone may pull the lever at a Fire Alarm Station which rings in code at all stations and is registered on a tape recorder at the Chief Engineer's Office. This coded signal, of course, also notifies all the Staff of the Hospital of the location from which the call originated.

The above system is also connected to the City of Toronto's Fire Alarm System.

The system of road lighting consists of directional luminaire type fixtures, mounted approximately 25 ft. high on steel standards. Depending upon the local conditions, the standards are equipped with one or two arms and luminaires as required. These standards are spaced approximately 140 ft. apart or as required to conform to the planning of the roadways, etc. These units are controlled by a time clock and the switching is so arranged that by grouping the circuits on relays ⅓, ⅔, or all lighting may be in use.

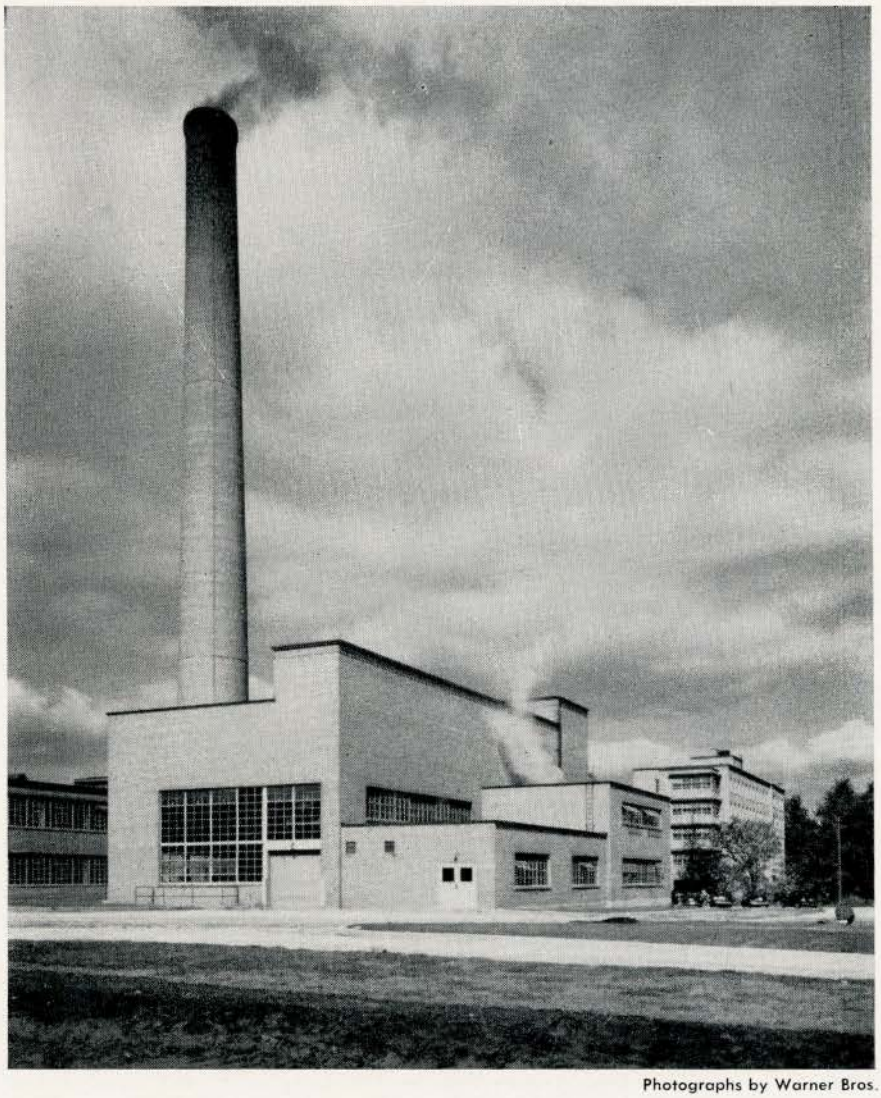


BOILER FEED PUMPS, POWER HOUSE

1—HOT WATER TANKS IN LAUNDRY

2—LAUNDRY, IRONERS ON MEZZANINE

3—HOT WATER HEATERS IN LAUNDRY



BOILER HOUSE
STAFF RESIDENCE IN BACKGROUND

Photographs by Warner Bros.

RED CROSS LODGE, SUNNYBROOK HOSPITAL

By W. L. SOMERVILLE

THE problem submitted by the Toronto Branch of the Canadian Red Cross Society was threefold. To design a building in harmony with the Hospital Buildings avoiding an institutional atmosphere; providing a place where patients could meet friends and relations; and the provision of overnight accommodation for visiting relations.

The solution is based on a free open plan for that proportion of the building to be used by patients, which consists of a large lounge, games room, writing room and canteen, with a separate wing containing single and double bedrooms and necessary lavatory accommodation and other conveniences for overnight guests.

The three separate functional units open directly off the main entrance foyer, the Lounge on the left as one enters; the Canteen on the right with door to wing containing Guest Rooms. An enquiry desk is located directly opposite the entrance, from which all sections can be supervised. An elevator from the Lobby to a tunnel connecting the Lodge with the Hospital Buildings also opens off the foyer and provides undercover approach in bad weather.

The Lodge is the largest of seven similar buildings erected by the Red Cross Society in Canada and was opened in January 1947. It was built by the Toronto Branch, decorated and furnished with contributions from organizations and individuals in and around Toronto.

The Lounge is the dominating feature of the building. French doors open on to covered terraces on both sides, the north terrace overlooking the bowling green and the south a sheltered, quiet, open grassy court. The general colour scheme of the Lounge is willow green, flame, and soft yellow, and produces a bright, cheerful effect. The walls of the Lounge to door height and those of the Reading and Writing Room and Games Room opening off the east end of the Lounge are panelled with birch plywood in natural finish. The floor is linoleum.

The Games Room offers shuffle-board, ping pong, card tables, and radio and record-player combination. The Reading and Writing Room is planned for writing letters or browsing through magazines, papers or books in an atmosphere of peace and quiet. It is well stocked with "thrillers", novels, and furnished in cheerful colours with writing desks and comfortable chairs.

The Canteen colour scheme is beige and green with red furnishings. The walls panelled in the same manner as the Lounge and Lobby. A spacious, completely equipped, modern kitchen serves the canteen arranged for the convenience and comfort of the 400 volunteers who work one shift each week. Light meals, snacks and soft drinks are served. The kitchen is equipped for the preparation of sandwiches, baking pies, short orders of ham and eggs and other such dishes popular with the patients. The natural lighting is from clerestory windows, screened to eliminate direct sunlight. The walls of salt-glazed structural hollow partition tile, light buff in colour. A separate room for dishwashing is placed so that soiled dishes are passed through a hatch directly from the Canteen. The service court for receiving supplies opens directly off the highway.

In the south wing thirteen bedrooms, for use of out-of-town relatives of very ill patients, are provided. The furnishings are in natural birch with gay curtains and varied colour schemes. This wing also contains living quarters for the Supervisor with bedroom, living room, kitchenette and bath. A similar suite is provided for the Janitor.

Accommodation for children has also been provided by furnishing some of the bedrooms with a small cot and a fenced-in playground on the lawn.

Credit is due to Mrs. V. A. Hooper, formerly Chairman of the Christie Street Lodge, who is now Chairman of the new Sunnybrook Lodge, and Mrs. E. A. Rolph for the many details in planning the furnishings and equipment, especially those provided for the comfort and convenience of the patients.

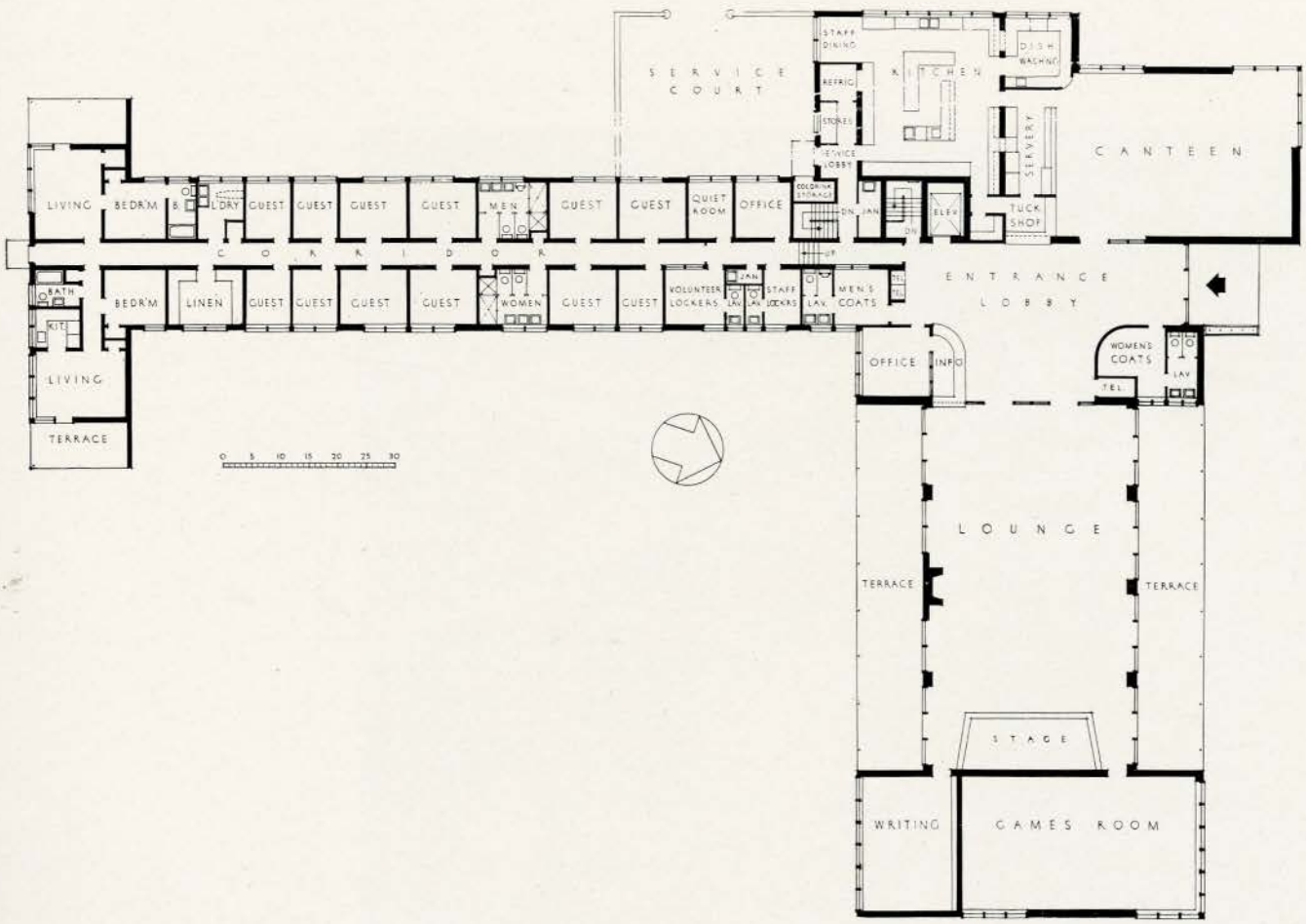
The building is heated from the central plant of the Hospital. The principal rooms supplied with warm air heated by low pressure steam coils in the air ducts with exhaust ventilation, the bedrooms with convection radiators.

Fluorescent lighting is used in the Lobby, Canteen and Kitchen, with incandescent lighting in the other portions.

A public address system from the main desk to speakers in the Lounge, Canteen and Terraces is provided for announcements and recorded musical programmes.

Photograph by Richard Mathews

RED CROSS LODGE, SUNNYBROOK HOSPITAL
OFFICE OF W. L. SOMERVILLE, ARCHITECT



LOUNGE

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READING AND
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INCORPORATED BY THE DOMINION PARLIAMENT 16th JUNE, 1908, 1st APRIL, 1912, AND 14th JUNE, 1929

NEWS FROM THE INSTITUTE

MEMBERSHIP IN THE R.I.B.A.

In the past, the procedure followed by Canadian residents, applying for membership in the Royal Institute of British Architects, was a rather long and involved process. Often there was considerable delay between the submission of his application and the granting of membership, caused by the forwarding of his application to the R.A.I.C. for comment before final approval was given. Now, through the co-operation of the R.I.B.A., this procedure has been altered, and in future there should be less time elapse between the date of application and its acceptance. Under the new system, the applicant will write to the Secretary of the R.I.B.A., requesting the full information concerning his qualifications for membership in the British Institute. He will receive the application forms and all details from the Secretary, and he will be advised to forward the completed forms through the R.A.I.C. Office. It will then be possible for the Institute to add its comments at the time of application, and to forward the applications direct to the R.I.B.A. It is hoped that this procedure will eliminate the delay which has been experienced in the past.

STANDARDIZATION OF BUILDING BRICK

The Canadian Standards Association is at present investigating the question of standardization of building brick, and members of the Institute will be receiving a questionnaire, asking for their comments in this connection. Members are urged to give their full co-operation in this important matter, and to complete and return their questionnaires to the C.S.A.

ARCHITECTURAL EXHIBIT

The R.A.I.C. Exhibit at the Canadian National Exhibition was a most interesting and successful display, and the most sincere congratulations are to be extended to the hard-working Chairman and the members of his Committee, who were responsible for the excellent results which were obtained. The exhibit has now been taken over by the National Gallery, and all arrangements for its future display are being made by that organization. The Institute has been advised that, in order to procure the exhibit for showing in any locality, it will be necessary for a local organization to make application to the Gallery, requesting that the exhibition be made available to them. Under the circumstances, the Institute is urging all Provincial Associations and local Chapters to give their co-operation and support to this worthwhile feature, and to make arrangements for its appearance in local centres within their jurisdiction. Members are asked to assist in this work, by creating a demand for the exhibition and by encouraging its display in as many centres as possible.

MEMBERSHIP LIST — AMENDMENT LIST NO. 1

The new 1949 List of Members of the Institute, which was recently forwarded to all members, is hereby amended by the following additions, deletions and changes:

Deaths — The Institute records, with deep regret, the death of the following member: Secord, H. F., 18 Toronto Street, Toronto.

Admissions — The Institute wishes to welcome to membership the following new members of the Provincial Associations: Desbarats, Guy, B.Arch., 552 Chemin Bord du Lac, Beaurepaire, P.Q. Langlois, Jacques Y., 7600 Delaroche Street, Montreal, P.Q. Roux, Pierre P., A.D.B.A., 656 Wiseman Avenue, Outremont, P.Q. Robillard, Lucien, A.D.B.A., Apt. 6, 7454 Durocher Ave., Outremont, P.Q. Skelton, David M., B.Arch., 2403 St. Louis Road, Quebec City, P.Q. Green, John F., B.Arch., 23 Hincks Street, St. Thomas, Ont. Jones, Barbara E. (Miss) B.Arch., 14 Rivercrest Rd., Toronto, Ont.

Changes — Members are asked to note the following changes of address:

Nova Scotia — Fowler, Charles A. E., 7 Ralph Devlin Drive, Halifax.

Ontario — Bishop, H. C., 717 Church Street, Toronto. Kemp, Leslie H., 37 Dalhousie Street, Brantford. Parkin, John B., 717 Church Street, Toronto. Parkin, John C., 717 Church Street, Toronto. Sklar, Murray, 165 Spadina Avenue, Toronto.

Quebec — Aspler, Charles, 179 Craig St. W., Montreal. Beaudry, Romeo, 3465 Blvd., Decarie, Montreal. Calame, Henri, 691 rue Crevier, Ville St. Laurent. Cinq-Mars, Marc, Room 51, 84 Notre Dame St. W., Montreal. D'Amours, Auguste, 2631 rue Bourbonniere, Montreal. Damphousse, Jean, 1459 est, rue Belanger, Montreal. Daoust, Emile, 3161 rue Joseph, Verdun. Destroismaisons, Maurice, 3768 Parc Lafontaine, Montreal. Drouin, J. C., 1041 rue de Montigny, Quebec. Gerson, Sydney, 1178 Phillips Place, Montreal. Goodfellow, Phil., Room 417, 1117 St. Catherine St. W., Montreal. Legare, Maurice, 255 Blvd. Monkland, Montreal. Louis, Max, Room 26, 179 Craig St. W., Montreal. Mace, T. H., 1434 St. Catherine St. W., Montreal. Mackay, Allan W., 1154 Beaver Hall Square, Montreal. MacLeod, Malcolm, 531 Beaverly St., Winnipeg, Manitoba. Mainguy, Maurice, 565 rue St-Jean, Quebec City. Marchand, Blaise, 9 rue Marechal-Foch, Quebec City. Martineau, Raymond, 12 Cote du Cap-Rouge, Quebec. Mathias, F. David, 6040 Gouin Blvd. West, Saraguay. Moreau, Gilbert, 10191 rue Delaroche, Montreal. Morin, Jacques, Rm. 51, 84 Notre Dame St. W., Montreal. Payette, Maurice, 6535 des Ecores, Montreal. Poirier, Adrien, 704 Monterey Court, San Diego, Cal. Powrie, R. D., 79 Station Rd., Baie d'Urfe. Rosenberg,

Wm. J., 2052 St. Catherine St. W., Montreal. Roth, Max W., 1015 Sherbrooke St. W., Montreal. Stewart, Geo. M., 4376 Western Avenue, Westmount. Vandal, Roger, 3450 rue Dandurand, Montreal.

ALBERTA

The writer of this letter left Canada early in July on a visit to the United Kingdom and has been there until recently.

It will interest members of the Alberta Association who were acquainted with the man to know that I had a very pleasant meeting with Mr. R. McD. Symonds formerly of Edmonton who is at present working with Mr. William Bryce Binnie, M.C., F.R.I.B.A., 125 George St., Bryanston Sq., W.1. He enquired after his former acquaintances and recalled many happy occasions of his Edmonton days. Like so many architects in the U.K. he has plenty of work on his boards but progress is slow with the work represented. The delays occasioned in obtaining permits, by shortage of materials and by priorities encountered in Canada must be multiplied by "x" in estimating conditions in the U.K.

One of the most striking things that the visitor notices in Britain is the condition of the roads. There may be no such thing as the perfect road, but that is the only word one can use in comparing these roads with those in Canada. This applies to main city streets, to minor streets and even to alleys and also to main country roads and little country lanes. The amount of traffic on all of these is also very striking. The number of vehicles per mile far exceeds that in the U.S.A. with more even distribution. Special tracks for bicyclists parallel many of the main roads. A surprising proportion of the vehicles are buses which traverse the whole country from Land's End to John o'Groats. These are preferred by most people to the railways, when travelling light, being more comfortable than the railway carriages and the fares are much lower. They are still managed by private companies. Their use is so general that the rising generation readily acquires a knowledge of the geography and history of their country that was not so easily attained 50 years ago, and this knowledge is, of itself, a liberal education. Not only are the streets and roads good; their cleanliness is wonderful, all appearing as if newly washed. The surfaces being black-top there is no dust. Provision is made for salvaging all bits of paper. Yet one sees little scavenging being done.

The larger industrial cities have been horribly blitzed. One hears many shocking tales, now quite calmly related, of scores of human beings being buried so deeply in debris that funeral services were held for them "en masse" long before their bodies could be recovered. The debris has now, in most cases been cleared away. In many of the gaps caused by explosions there now stand pre-fabricated huts of steel L frame and asbestos board sheathing. There are many colonies of these that cover several acres, looking stark and raw, owing largely to the want of trees. The occupants find them convenient for living and for the most part are happy to have the accommodation. In many cases they are probably better housed than in their former crowded apartments. Many of the London open "commons" once inviolable by building have been used partly for these "pre-fabs" and partly as allotment gardens. The general effect is not lovely.

Next to "pre-fabs" the most active building seems to be on new factories sometimes in the form of Industrial Estates, in which acres of ground may be covered with long factory sheds which may be rented at so much per foot or per unit. In other cases private firms are erecting their own buildings some of which are charmingly designed and landscaped. Near Manchester I noticed a good deal of this. In that city much has also already been done to take advantage of blitzed areas to improve former congested parts of the city. The city is there working upon a plan which was published in 1945. The preparation of that plan was diligently pursued whilst the war was still going on. It is in the form of a volume of 275 pages containing, besides the projected proposals, a great mass of statistical data on a great variety of subjects on which the revised plans have been based.

Many times since my return I have been asked "What do you, or the people of Britain, think of the general situation." It is beyond my ability to give an answer to that question, and probably it is beyond the scope of this *Journal* to discuss it. Two facts have been forced upon my attention whilst living with the people most concerned. On the one hand, the business men are grimly carrying on in circumstances in which they are severely hampered by many restrictions and under crushing taxation. On the other hand the effect of the uniform ration must be put in the scale. Statistics show that the children of the poor are taller and heavier for their ages than ever before. School teachers say that their pupils are appreciably healthier, cleaner, happier and more intelligent than formerly. One cannot wonder that the party which has accomplished that result has never, so far, lost a by-election. They have performed a feat unparalleled in the history of nations. But this is at the cost of a continuous financial loss to the national purse.

Cecil S. Burgess

THE ALBERTA LETTER

In this issue the Editor welcomes back Mr. Cecil S. Burgess, whose monthly letters from Alberta were unbroken from the founding of the Provincial Page to July, 1949. Mr. Burgess was abroad, or the gap in August would not have occurred. We have twice called on Mr. Burgess, in Edmonton, to tell him personally of the affection and regard which the Editorial Board, and all architects of our acquaintance, hold for him through his letters from Alberta, but he was away on both occasions. We look forward to seeing him at Winnipeg.

Editor

BRITISH COLUMBIA

Architectural Education and Training

A short while ago the Victoria Chapter of the A.I.B.C. and student associates from the various offices here were privileged to hear Professor F. Lasserre, Director of Architecture, University of British Columbia, speak upon this much discussed subject.

I feel sure the speaker left no doubt in the minds of those present that he considered the only means of entrance to the profession should be by way of the five-year School of Architecture course, and the total elimination of the articled pupil. However, he agreed that two years in an architect's office should follow graduation from the school before a student could become registered – making seven years in all.

No wonder there was disappointment and a sense of frustration among some of the student associates at the Professor's remarks; for he inferred that they had started on the wrong foot and would be at a great disadvantage when taking their examinations, by reason of the fact that their training (or education) would not have been along the lines followed in the School of Architecture. If any further enlightenment on this point is necessary it can be found in Professor Lasserre's article "On Architectural Education" in the May, 1949 issue of the *Journal*, in the course of which he said "in British Columbia the School is a new one and its standards *will have to be largely met by the student associates before admission to the profession*" (the italics are mine).

To digress a little here; I venture to say that notwithstanding all that has been said and written about the changing nature of architects' clientele there are still plenty of the individual type, and most of them have a fairly good idea of what they want. These will not permit their architects to lead them too far from the objective they have set their minds on. After all, it is the client who foots the bill; he still has some rights in this country, and his desires command due consideration at least, even though his ideas may not conform largely to School of Architecture design standards.

Fortunately we, as yet, enjoy freedom in Canada; there is no Stalin or Mussolini here to direct what form Architectural education shall take.

Whether the training of our future architects is to be left entirely to the Schools or not is a question that merits a lot of consideration, and I make no attempt to enter into such a controversial subject here. Even the Schools appear to differ as to what form the preparation should take – a blending of education and training seems their general aim.

My main reason for writing this letter is to call attention to the position in which student associates presently serving under indenture in architects' offices find themselves; who have chosen this time-honoured way of entrance to the profession. Are they to be penalized for having done so?

One must not lose sight of the fact that provision is made in the Architects' Acts for the admission of student associates' training in offices, and as long as the Acts remain in the statutes without amendment of this provision, there will, no doubt, be students who will avail themselves of it – if for no other reason than financial inability to take a University course. The time has not yet arrived when scholarships and monetary grants may be available to enable such students to take five-year courses (and incidentally provide their living expenses during that period, if they have no other means).

The days when articled pupils paid premiums are long past, of course. Now-a-days it is customary to pay our student associates salaries; from commencement in most cases. Not infrequently the salary is a liberal one, especially if it happens to be a young married man whose training or career has been broken into through service in the late war; and there must be many such cases in the architects' offices throughout Canada at this present.

P. Leonard James

LETTER TO THE EDITOR

While not desiring to embark upon any lengthy polemics, I do wish to have the opportunity of answering Mr. Kent Barker's and Mr. L. E. Shore's letters in the August issue of the *Journal*. They make comments about my article "On Architectural Education" in the May issue which require taking to task.

This article dealt with the function and aims of Architecture and of Architectural Education, so as to establish how this education might best be carried out.

An objective reader would find nothing in my article to indicate that I "admire" Soviet Buildings or present-day Russian Architecture. To us in the Western Democracies and most emphatically to me, the quality of recent designs in Russia is a distressing architectural retrogression from the early experimentation there of the Constructivist Groups.

I also did not say that students should study Russian Architecture (though why should they not have a good look at it?), nor that Russia should be pointed to as "the most forward-looking country in Architecture" (L. E. Shore). I regret that in an attempt to abbreviate my thesis I might have given an opportunity to some to read sinister intentions where obviously none existed. The trend in this country (Canada), I gather from statistics and facts made available to all, is towards a greater centralization in government and in industry and commerce. The last two are being taken over to an even greater degree by the governments in many countries, more so the further to the left the government is. I took a short cut and referred to what has been happening in the ultimate in state control and ownership (Russia) as a parallel to what basically is happening to all of us – whether we like it or not. We may be thankful that it is not happening here as it occurred in Russia.

England, a socialist country, or other socialist or social-democratic countries such as Sweden, Switzerland or Denmark (illustrated in the issue of the *Journal* in which the above two letters appeared) might have been shown as good intermediate examples. In these countries a great concern in the return to native forms and decoration symbolic to the people has also been indicated. This has been best exemplified by the *Architectural Review's* recent interest in "The New Empiricism" or "New Monumentality". This new trend is a direct product, I believe, of the influence of the anonymous client and his desires and loves upon those who commission buildings to be built and on those who design them.

"Quoting from the World's Fair Issue of *Architectural Forum*, June 1939: 'Rated first among foreign pavilions in a recent Gallup poll, the pavilion of the Soviet Union is a powerful, if occasionally naive, piece of monumental architecture. Designed for rebuilding . . .' I considered it a hideous building – the American people did not."

Both of the letter writers quoted the *Architectural Review*, and I am pleased to refer the readers to the same magazine when in November 1942 it published an article on Soviet "Socialist Realism", by Edward Carter, respected past Librarian of the Royal Institute of British Architects. Here, dealing with Russia where a still greater degree of public or state control exists than in the other countries I have mentioned, we find Mr. Carter writing:

"The character of Soviet Architecture is the product of a new heightened valuation of the importance of popular taste, just as the quantitative achievement of Soviet Architecture is a product of a heightened valuation of popular needs. This has been developed into the esthetic principle known as Socialist Realism. Realism demands of the artist constant active participation in the daily activities and the emotions of the people whom he serves. There can be no capacity to represent life realistically, if this real and active participation does not exist. That is the characteristic of realism, and that has in fact been the characteristic of all art, including architecture, of the great historical periods. But participation in the activities and emotions 'of the people whom the artist serves' is not necessarily socialist realism. Such participation is a characteristic, according to Soviet theory, of all good art; but it may imply the existence of this unity as between artist and the limited community of the ruling class of his time. The eighteenth century architect achieved this coordination superbly and perhaps, within the limited associations of big business and the architects to-day who serve them, a similar realism is achieved.

"What the Soviet claims to have added and has elevated into a positive principle is the 'Socialist' characteristic – which in its simplest terms is nothing more than the spread of this realism, this active contact, so that every element of the activity and emotion of a whole people is tapped as the influence compelling the artist".

It seems to me, without prejudice, that some very pertinent and thought-provoking material is indicated here related to the resolving of the focal problems raised in my article. It in no way implies sympathy for revolution, dictatorship or tyranny.

In the confused professional and educational situation in which we find ourselves to-day, as outlined in my article and as so well illustrated by such diametrically opposed current, architectural philosophies as those of Wright and Le Corbusier, it seems incredible that we, as a learned and cultured profession, should not desire to seek from all sources the truth and ideas which may assist us in the resolving of our own problems and contradictions. It is regrettable that Mr. Barker and Mr. Shore saw fit to read into my article political meaning, sinister intentions and "propaganda for the Glories of Russia".

The Rockefeller Foundation has supplied large quantities of money to a number of American Universities, for increased study of Slavonic, and principally of Russian, languages and culture. Our own University of British Columbia's Department of Slavonic Studies received a $90,000 grant. I understand that this Department, and similar departments at other Universities, have very interesting material on art and architectural thought in Russia, and they have been eager to impart this information to others – with no intention, I gather, of selling "the Glories of Russia"!

Also, Mr. Barker and Mr. Shore might be interested to know that a few years ago the publisher of the *Journal* showed me in the *Journal's* offices a couple of piles of Russian Architectural Magazines. From what I remember of them, they were not as offensive to the eye as they were to the nose. If the magazines are still with us, these gentlemen (armed with clothes pegs) might find another facet of the story of Russian Architecture presented to them by the *Architectural Review*.

I hope, Mr. Editor, that the *Journal* of our Institute will steer clear of political and prejudiced thought. We have severe aesthetic, professional and educational problems to solve. Let us search for the truth and not stifle it or distort it with political entanglements.

Fred Lasserre

☆

We are sorry that Mr. Lasserre felt it necessary to put a sting to the tail of his letter of reply. The controversy on Russia was provoked by Mr. Lasserre. The Editorial Board merely carried out what it assumed to be its democratic function by publishing the provocative article and the letters in reply. Anyone may write to the editor, and his letter will be published. Treason, obscenity and interior decorating are among the few prohibited subjects.

This correspondence is now closed.

Editor

OBITUARY

HERBERT FERRIS SECORD

Herbert Ferris Secord was all that the name "architect" used to stand for. In his passing, part of our profession died also.

A man of the most highly developed sensibilities, unassuming, of great personal charm, the most casual acquaintance did not forget him. Those who could call him friend were rewarded by a wealth of understanding which few men can give. Those whom he served professionally were rewarded by excellent design, by a comprehensive interest in and understanding of their problems, and by the whole hearted support of their every interest. He will be greatly missed not only by his family, by his office, by those who knew him at "the Club", in musical circles or at other off times, but by his clients, of whom the writer was happy to be one.

The bold statement of the career of this gentleman genius follows: the class of 1910, faculty of Applied Science, University of Toronto; association for short terms with the architectural firms of Carrere and Hastings, New York, Eustace Bird, Wickson and Gregg, Toronto; in partnership with Gordon West and George N. Molesworth from 1915 till 1936 under the firm name Molesworth, West and Secord; in partnership with Harold Savage and George Molesworth from 1936 till 1945 under the name of Molesworth, Secord and Savage. He was a member of the Arts and Letters Club and the St. George's Society, President of the Toronto Conservatory Choir, and past Vice-President of the Toronto Mendelssohn Choir. He married Mary Gladys Alley, to whom with one daughter and two sons the profession extends its deep sympathy.

Anthony Adamson

STRUCTURAL FEATURES

(Continued from page 345)

Between the Chapel and the Up-Patients' Building there is a passage which took the form of a flat brick masonry arch. Actually it was a concrete beam with a brick veneer. This veneer was hung on the underside by reinforcing the joints of the brickwork with small rods. Wire hangers looped around reinforcing were carried up to the concrete above. The brick was placed before the concrete was poured. All joints in the brickwork were carefully grouted with cement grout.

The Biological Building was of concrete construction using flat concrete beams and one way slabs in order to reduce the storey height as much as possible. This required closer spacing of columns than in the other buildings. This was quite acceptable in this building.

Expansion joints were placed at all junctions of building or of buildings and connecting passages. They extended from the footings to the roof. Below ground level the joints were made waterproof and above ground level weatherproof. The joints through trafficked portions of floor slabs were provided with sliding brass plates on angles. By the use of these joints no unit longer than 300 feet was without an expansion joint except the Active Treatment Building. This building is 496 feet long. As may be seen from the photograph of this building in its finished form there is no logical place for an expansion joint anywhere near the center of its length. To put a vertical line of an expansion joint down the facade of this building would have jolted the aesthetic sense of even an engineer. Also there would have been severe problems in wind-bracing. It was decided to omit any expansion joint in this building even though it is much longer than usual for buildings without expansion joints. Extra special reinforcing was added where openings reduced the cross section of the slab materially, such as at stairways and elevators and at corners. To date there has been no sign of cracking that can be blamed on the lack of expansion joints.

Prolonged as this article may seem, there are probably many other features that have not been covered and which were worthy of comment. I trust that at least some of the remarks may be of interest and value to Canadian Architects.

CONTRIBUTORS TO THIS ISSUE

Brigadier the Honourable Milton F. Gregg

Minister of Veterans' Affairs. Has had a distinguished career as a soldier, educationalist and administrator. Following World War I, during which he was awarded the Victoria Cross and Military Cross (Bar), he was appointed Sergeant-at-Arms of the House of Commons. At the close of World War II, in which he also served, Mr. Gregg assumed the Presidency of the University of New Brunswick, from which post he entered the Federal Cabinet as Minister of Fisheries, and, later, in 1948, was appointed Minister of Veterans' Affairs.

Emmett Patrick Murphy, C.M.G., LL.D.

Born Ottawa July 17, 1887. Educated: St. Patrick's School, Ottawa; Ottawa Collegiate; Queen's University. Joined Civil Service in 1907 in the Department of Railways and Canals (now Transport Department) as Engineer on the Trent Canal. Remained with that Department until appointed Construction Engineer with War Supply Board in 1939; Director of Construction, Department of Munitions and Supplies, 1940-1942; appointed Deputy Minister of Public Works, October, 1942. Member, Engineering Institute of Canada; Registered Professional Engineers of Ontario. Residence: Laurentian Club, Ottawa, Ontario.

Karl E. Hollis, M.D., C.M.

Graduate of Queen's University and a Fellow of the American College of Anesthesiology. He served in both World Wars. At the close of the first war he entered private practice in Toronto, later specialized in Anaesthesia, and became head of the Department of Anaesthesia at the Toronto Western Hospital, and was a member of the Advisory Board of that Hospital.

In World War II, he commanded Rideau Military Hospital, Ottawa, and the Hospital Ship, Lady Nelson. On discharge from the army in 1945, he was appointed Superintendent of Sunnybrook Hospital.

Hugh L. Allward

Born in Toronto, attended University of Toronto School, served in the Royal Flying Corps; entered the U. of T. following the War; left after second year to assist Walter S. Allward on the drawings of the Vimy Memorial; worked and studied in Europe, became a Fellow of the R.I.B.A. in 1936, and was elected a Canadian Acadamician in 1946. Worked in the office of Chapman and Oxley for several years, entered private practice in 1929, and joined G. Roper Gouinlock in 1935.

Gordon L. Fowler

Native of Saskatchewan, graduated from the School of Architecture, University of Toronto, in 1931. Associated with the firm of Allward and Gouinlock since its formation in 1935.

Richard A. Fisher

For biographical information see *Journal* for June, 1949.

Albert Edward Watson

A fuller light illuminated all, when in an atmosphere of apprehension stilling momentarily that gaiety of the Victorian nineties, came the nativity of our subject. Subsequently, steeped in the traditional English manner of secondary education, toyed with the illusion of achieving architectural eminence. Results? *quod vide*. Albeit, studied architecture at the Polytechnic School of Architecture and under the tutorship of the late Edmund Walter Wimperis, F.R.I.B.A., London, England. Guild Prizeman in design, Member Ontario Association of Architects 1908; World War I, Canadian Engineers, France; private practice in Toronto; practice in New York City; World War II, Senior Assistant Architect, Royal Canadian Navy, Halifax; associate member of the firm Allward and Gouinlock, Toronto.

D. E. Catto

Born in Toronto and attended St. Clement's College and Central Technical School. Left the latter to enlist in the Artillery and served in France as a Gunner with the 2nd. How. Battery CFA. Returned to Toronto, and graduated in architecture, Faculty of Applied Science (2T3). Partner in the firm of Catto and Catto until mobilization in 1939. Proceeded overseas with the Royal Regiment of Canada, and took command of the Regiment in 1942. Returned to Canada in 1945, and resumed practice as an associate of Allward and Gouinlock.

Clare D. Carruthers

For biographical information see *Journal* for June, 1949.

Harry H. Angus

Consulting Engineer. Heads firm of H. H. Angus and Associates, Toronto. Formerly draftsman and designer with Ingersoll Rand, Quebec; Westinghouse Machine Company, Pittsburgh; Bethlehem Steel Company, Bethlehem, Pa., and Western Electric Company, Chicago. Graduate of University of Toronto, Mechanical Engineering.

R. P. Allsop

Born Sheffield, England, attended King Edward VII Grammar School and Wesley College. Student Engineer with Davy Brothers, Engineers, Sheffield. Joined R.A.F. 1930. Came to Canada and employed by Darling and Pearson, and Mathers and Haldenby for several years. Commenced own practice in 1939.

W. L. Somerville

Past President of R.A.I.C., and O.A.A. Fellow of the Royal Institute of British Architects, and Treasurer of Royal Canadian Academy of Art. Architect for Lodge Buildings at Ste. Anne de Bellevue, Quebec; Westminster Hospital at London, Ontario, and Sunnybrook, Toronto; also for Junior Red Cross Hospital for Crippled Children at Calgary, Alberta, and numerous small Red Cross Out-post Hospitals in Northern Ontario.