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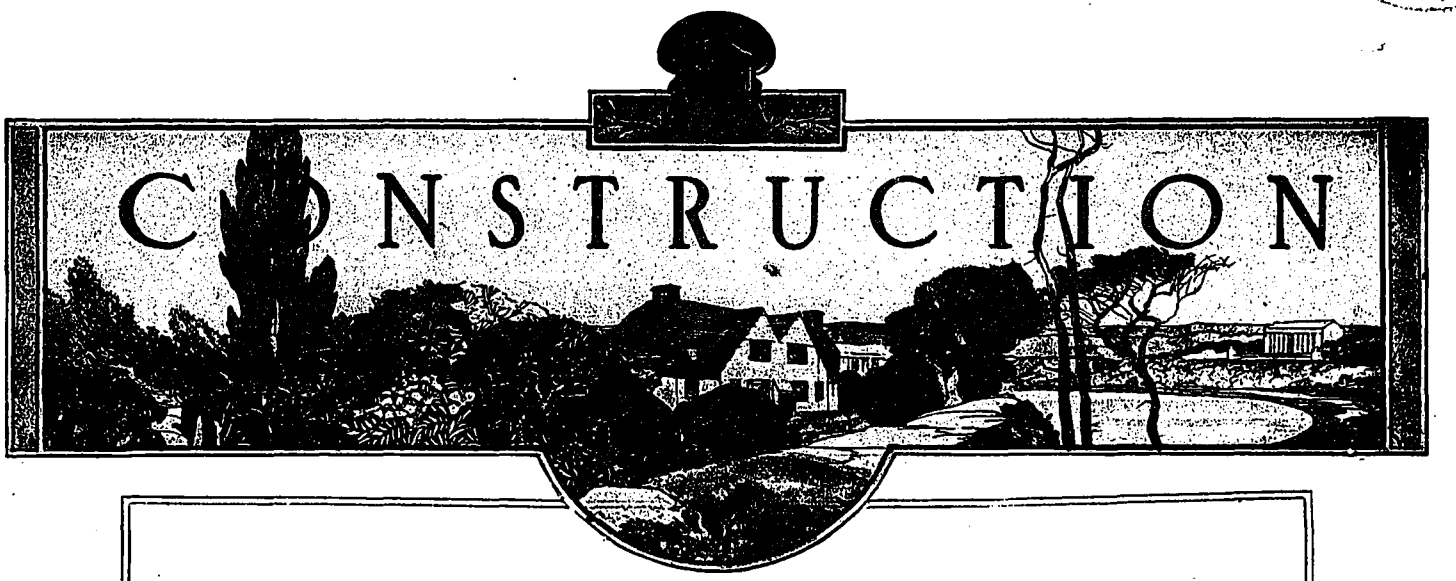

March, 1920 Volume XIII., No. 3

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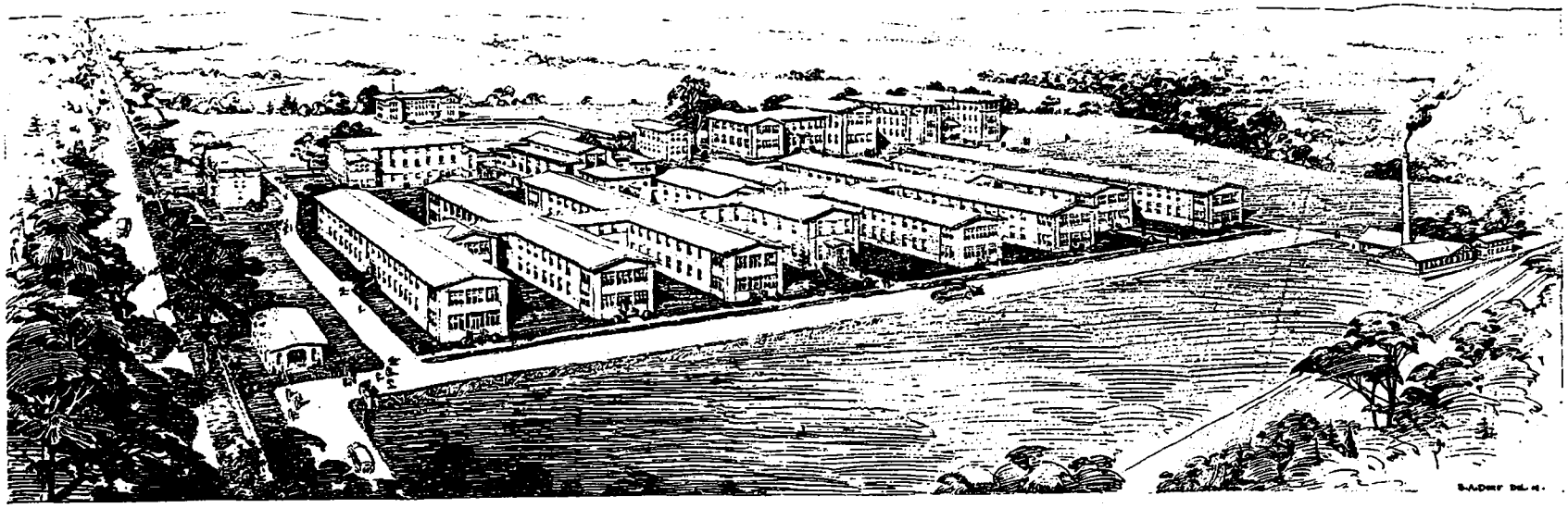
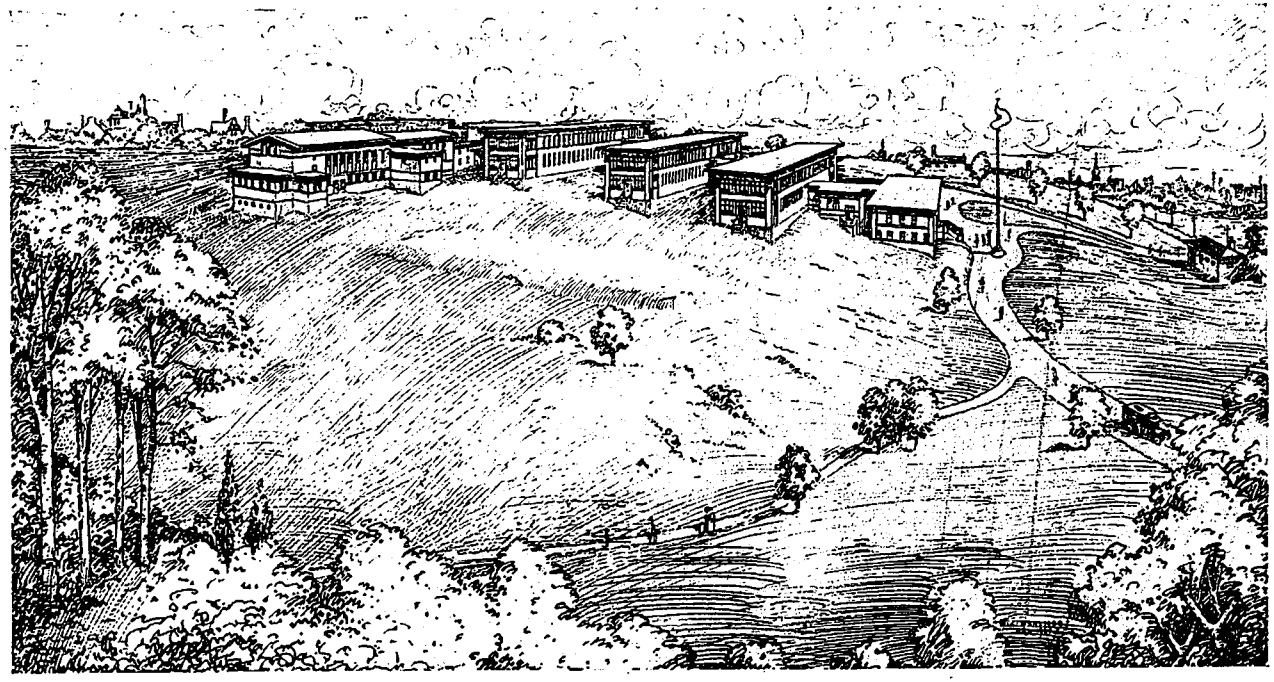


CANADA'S MILITARY HOSPITALS.

DEPARTMENT OF PUBLIC WORKS, OTTAWA.

R. C. WRIGHT, CHIEF ARCHITECT.

W. L. SYMONS, ARCHITECT IN CHARGE OF MILITARY HOSPITALS.



UPPER VIEW: STE. ANNE DE BELLEVUE, P. Q.

LOWER VIEW: CAMP HILL, HALIFAX, N. S.

Canada's Military Hospitals

By W. L. Symons, Architect in charge of Military Hospitals.

THE question of Military Hospitals, their inception and rapid development under the administration of the Military Hospitals Commission, has been dealt with in a former number of this magazine. Too much cannot be said in praise of the original organization, in its efforts to cope with a situation so new, so sudden, and so prodigious in its scope, as the caring for the ever-increasing flow of convalescents from the battlefields of France and Flanders.

The purpose of this article will be to record the further development of the work, and the gradual evolution in hospital planning and growth which has brought the work to its present state of completion.

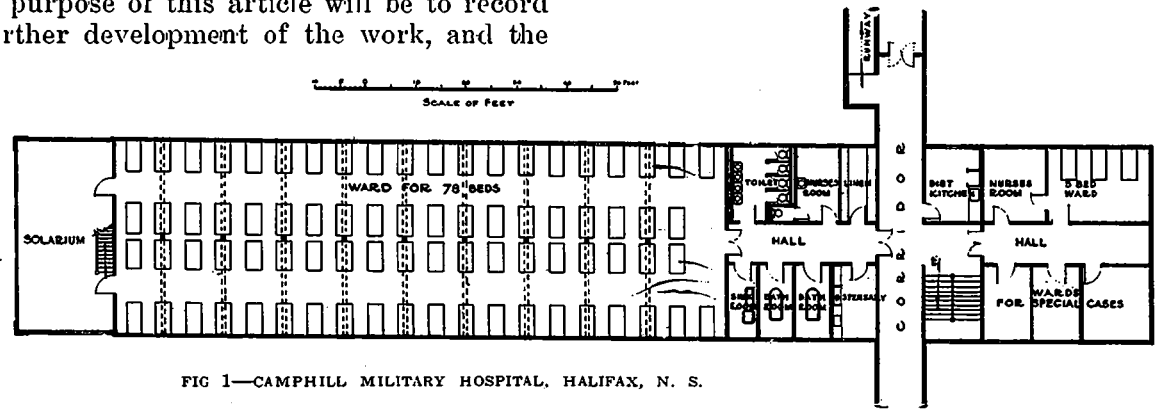


FIG 1—CAMPHILL MILITARY HOSPITAL, HALIFAX, N. S.

On April 1st, 1918, the entire work of building and equipping military hospitals was transferred from the Military Hospitals Commission to the Chief Architect's Branch of the Public Works Department, Ottawa, and to the efforts of that staff are due the success which has attended the furtherance of this work to its present stage of development.

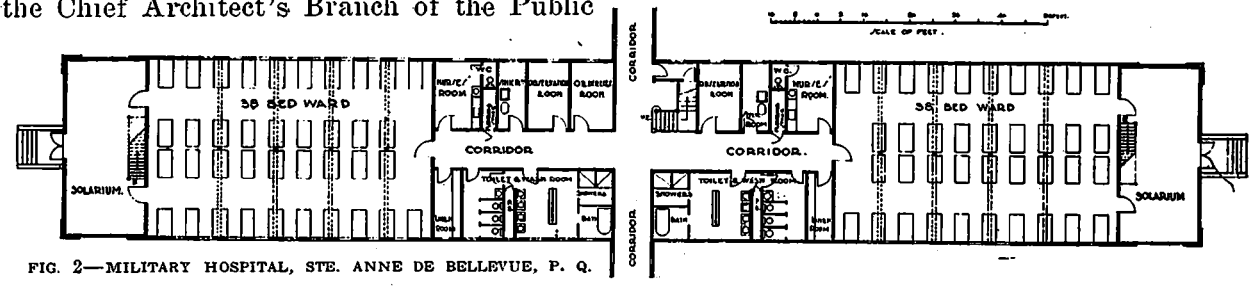


FIG. 2—MILITARY HOSPITAL, STE. ANNE DE BELLEVUE, P. Q.

The Department of Militia and Defence, under whose authority the control and maintenance of all military hospitals came upon completion, appointed a special committee at the time consisting of an expert in each branch of the Medical and Surgical Service. To this Board of Consultants were referred the plans for expert advice, and to this collaboration with the architects is no doubt due a large measure of the success attained.

Beginning, as it did, in the early period of the war, with the caring for invalid cases in private houses—many of them generously loaned to the Government by the owners—the growth of military hospitals in Canada might be recorded as follows:

(a) The remodelling of large dwellings such as Oak Hill Military Hospital, St. Catharines, Ont.; Elmhurst, Kingston, Ont.; and the Sir Sandford Fleming House, Ottawa, Ont.

(b) The remodelling of schools, colleges, and other large public buildings, such as Queen's University, Kingston; Loyola College, Montreal; Knox College, Toronto; Ross Park School, Moose Jaw; Earl Grey School, Regina; Ogden Hotel, Calgary; Shaughnessy and Fairmount Schools, Vancouver, etc.

(c) By additions to existing institutions, such as the Asylum at Whitby, Ont., and the Reformatory at Guelph, Ont.

(d) By the building of entirely new units capable of expansion, as, for example, at Camphill, Halifax; Ste. Anne de Bellevue, P.Q.; Westminster, London, Ont., and Tuxedo, Winnipeg.

The latter development represents to date the ultimate and most important phase of military hospital work which has so far been carried out. As the war dragged on into the third year and the devastation and toll in lives became very real, those entrusted with the work began to realize what a tremendous undertaking confronted them. It likewise became evident that the demand for facilities was fast outgrowing the policy of altering and adding to existing buildings. New buildings with increased accommodation must be provided, and on short notice, buildings of permanent construction were

out of the question. Then it was that the construction of semi-temporary buildings became the set policy. The type adopted had much to recommend it. It was economical, could be quickly built and easily altered and added to.

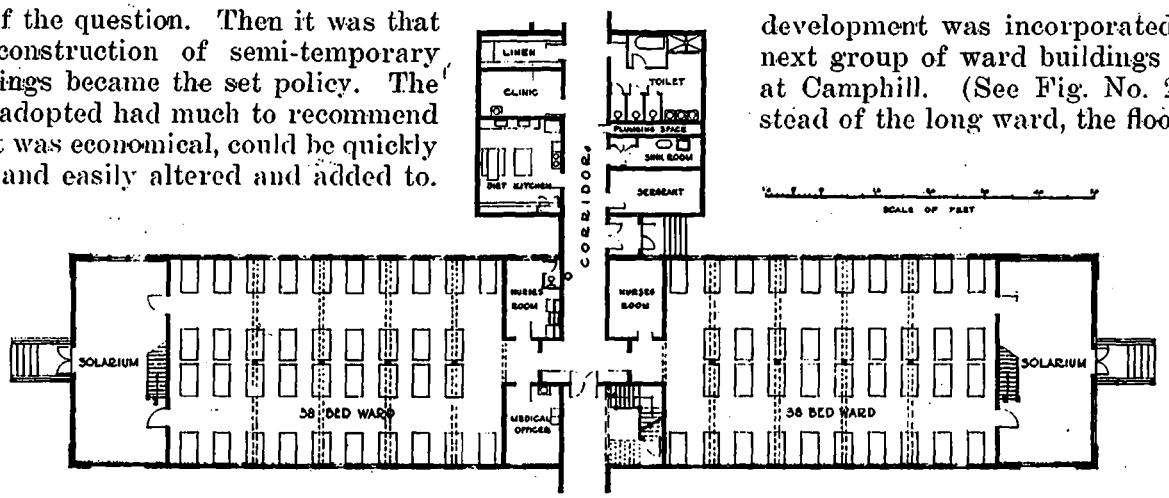


FIG. 3—MILITARY HOSPITAL, TUXEDO PARK, WINNIPEG.

The first building of this type and an entire unit was built at Camphill, Halifax, N.S. (See Fig. No. 1) It consisted of two ward buildings, each accommodating one hundred and fifty patients, together with a general service building.

These ward buildings were two storeys high, providing on each floor for one large ward of 76 beds. At one end of the ward was a connecting corridor, and adjacent to it were rooms for nurses, orderlies, toilets, and general utilities. At the other end was a large solarium with a stairway leading from the first to the second floor.

This arrangement of stairs was most workable, as it served to reduce the traffic through the wards, and at the same time would afford quick and easy exit in case of fire. The solarium was invariably made a most attractive lounge room, thanks to the efforts of the ladies of the local societies. As a description of this first type of unit was given in a former article it is unnecessary to go further into detail here. Suffice to say that as a first attempt it proved eminently satisfactory, so much so that duplicates were built at North Toronto and Winnipeg.

Further study of the problem, however, suggested improvements which subsequently led to certain changes in the ward unit plan. The first development was incorporated in the next group of ward buildings erected at Camphill. (See Fig. No. 2.) Instead of the long ward, the floor space was divided into two self-contained wards of 37 beds each, with its full complement of nurses' and utility rooms, while the connecting corridor, instead of being at one end, was made to connect the units midway in their length. The advantages were manifest. The smaller number of patients in a ward made for better discipline and efficiency generally. This second plan was followed in some of the new wards at Cobourg and Ste. Anne de Bellevue. While very compact and workable, even this plan was found to be capable of improvement, and a third development was worked out. This last change made for economy, but it is still an open question whether it did not possess disadvantages sufficient to outweigh this feature. (See Fig. No. 3.) In this plan the nurses' and orderlies' rooms were left adjoining the ward, but all toilet and utility rooms were placed in a small separate building, a sort of enlargement of the through corridor. The chief improvement was in the farther removal from the wards of the odors from diet kitchen, toilets, etc., but to offset this was the disadvantage of the distance the meals and other bed services had to be carried.

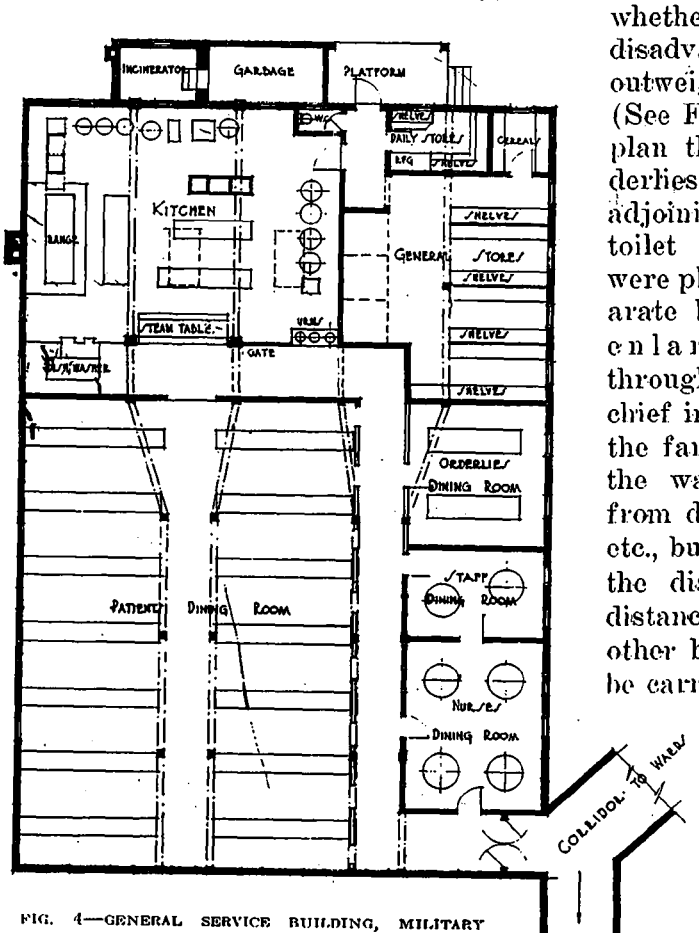


FIG. 4—GENERAL SERVICE BUILDING, MILITARY HOSPITAL, DAVISVILLE, NORTH TORONTO, ONT.

GENERAL SERVICE BUILDINGS.

One important feature of all the larger groups was the general

service building, containing the kitchens with all accessory rooms, and dining-rooms. These buildings represented much study, and passed through several stages of development with each successive step making for a more workable and better systematized plan. The first was erected at the Davisville Hospital in North Toronto (See Fig. No. 4) and consisted of a large kitchen containing the necessary equipment for preparing and cooking the food, and washing and sterilizing the dishes. The only additional rooms were for cold storage and garbage disposal. The main dining-room had a seating capacity equal to two-thirds of the total number of patients, and adjoining were separate dining-rooms for nurses, orderlies, medical officers, etc.

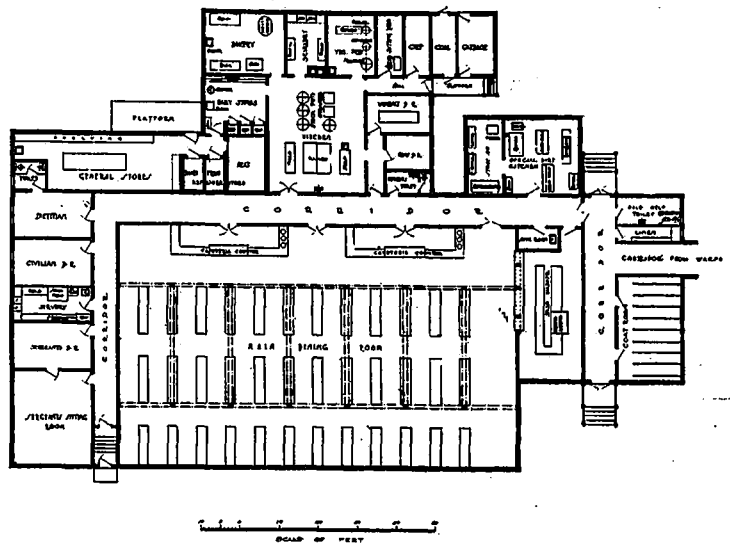


FIG. 5—GENERAL SERVICE BUILDING, CONVALESCENT HOSPITAL, STE. ANNE DE BELLEVUE, P. Q.

At Fredericton and Ste. Anne de Bellevue this scheme was enlarged. (See Figs. No. 5 and 6.) The main kitchen contained only the ranges and other cooking equipment, while the food preparation, the bakery, dishwashing, refrigeration, general stores, and garbage disposal had each a separate room opening off the main kitchen. As may be seen on the detailed plans, the main kitchen is lighted with clerestorey windows which provide excellent light as well as ventilation. The working equipment is of standard hotel heavy duty type, consisting of ranges, steam cookers, steam-heated stock pots, steam tables, motor-driven vegetable peelers and food choppers, and for centers where the population exceeded 250, motor-driven dish-washing machines were installed.

The necessity of feeding a large number of men in a short time gave rise to the introduction of a Cafeteria service. This innovation was first introduced at the Discharge Depots at Halifax and Quebec where all convalescents were cleared from inbound ships, as many as fifteen hundred patients being served at a single meal. The system worked so successfully here that it was thoughts wise to install it in some of the larger hospitals, such as Ste. Anne de Bellevue, where as many as seven hundred patients were often served.

At the larger centers refrigerating plants have been installed for cooling purposes and for the production of artificial ice. Also fully equipped steam laundries were provided, including steam sterilizers for bedding and clothing.

MEDICAL AND SURGICAL DEPARTMENTS.

The development outlined in the planning of the ward pavilions and service buildings also occurred in regard to the accommodation required for the various branches of medical and surgical work. As for instance, the laboratory department was originally housed in one room, but eventually the necessities of this department could only be met by the erection of a separate building. The same may be said of the accommodation for the dental service, X-ray, electrical treatment department and massage department.

The requirements consequent on research in these departments were developed so rapidly and were of such importance that in each case special rooms and equipment were found necessary, and subsequently requiring a building for its own use.

Nor has the scientific equipment been neglected. On the contrary every department has been planned and outfitted along the most

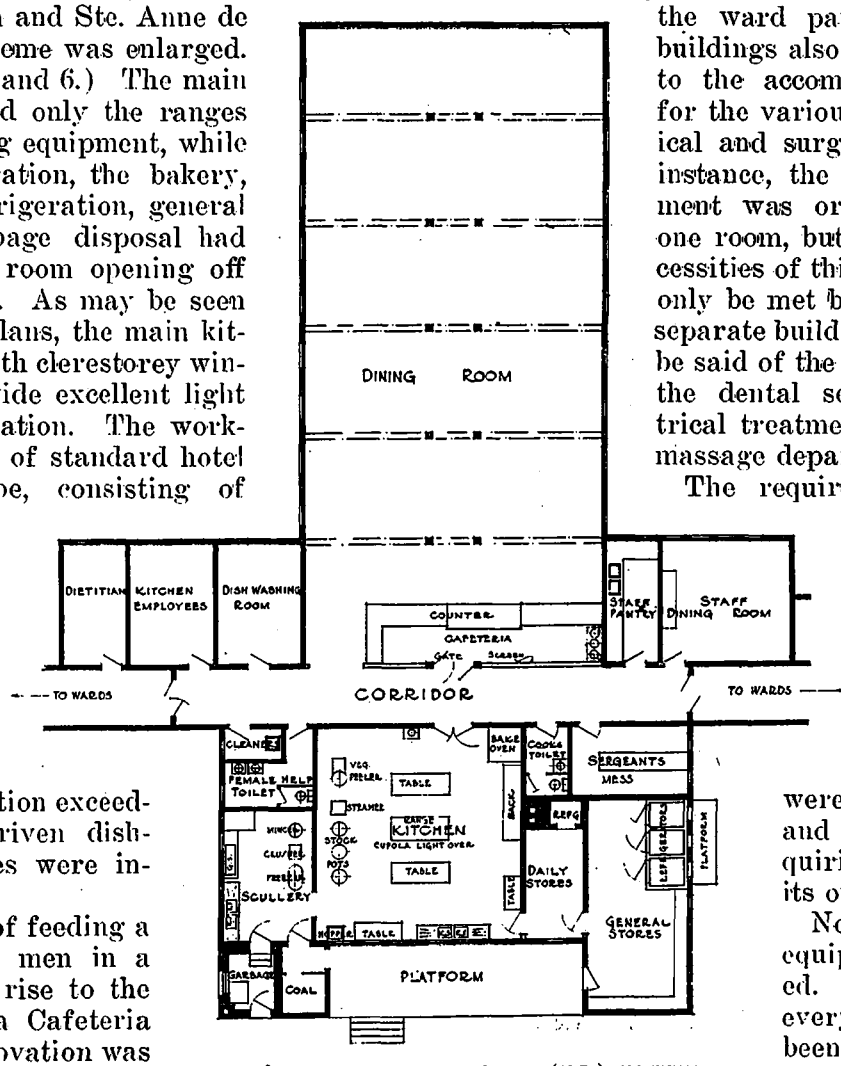
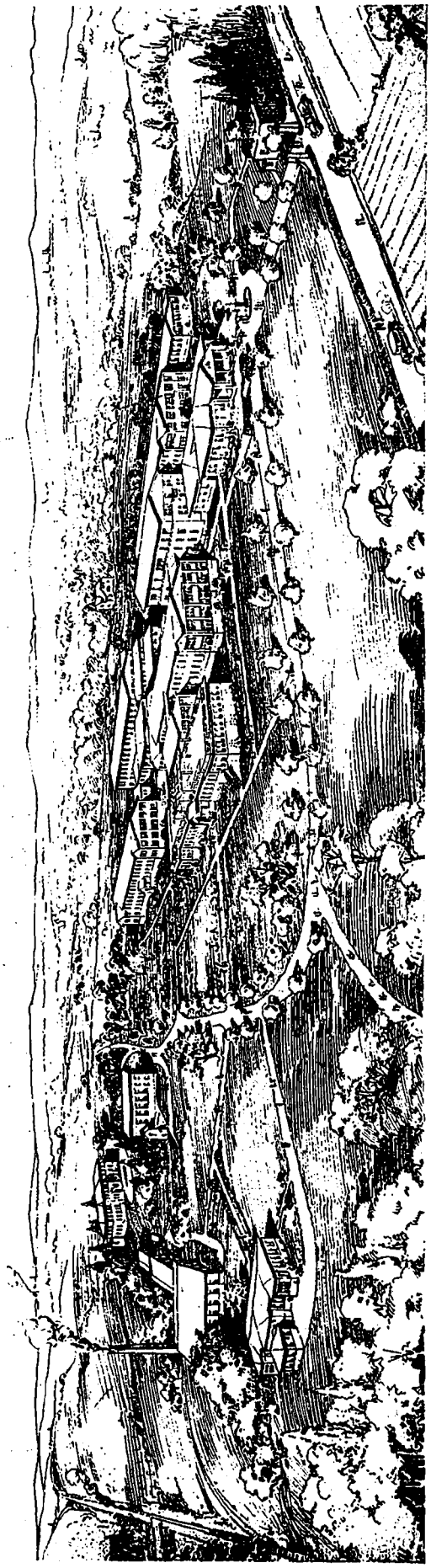


FIG. 6—MESS UNIT, FREDERICTON (N.B.) HOSPITAL.

scientific lines known to the medical profession.

The surgical buildings contain, in addition to most up-to-date operating rooms, all the complementary rooms, such as preparation, sterilizing, X-ray, etc. There are also the necessary provision for the treatment of nose, ear and throat cases, and up-to-date dental suites. One of the most interesting features is the hydrotherapy department with its full complement of electrical, continuous hot and cold water and arm and leg baths. These rooms are immaculate in white tile, marble, and white enamel paint, and the equipment is the best that science has produced.

While endeavoring to evolve the best methods for restoring the health of the patient through modern equipment and efficient service,



PSYCHOPATHIC HOSPITAL, LONDON, ONT.

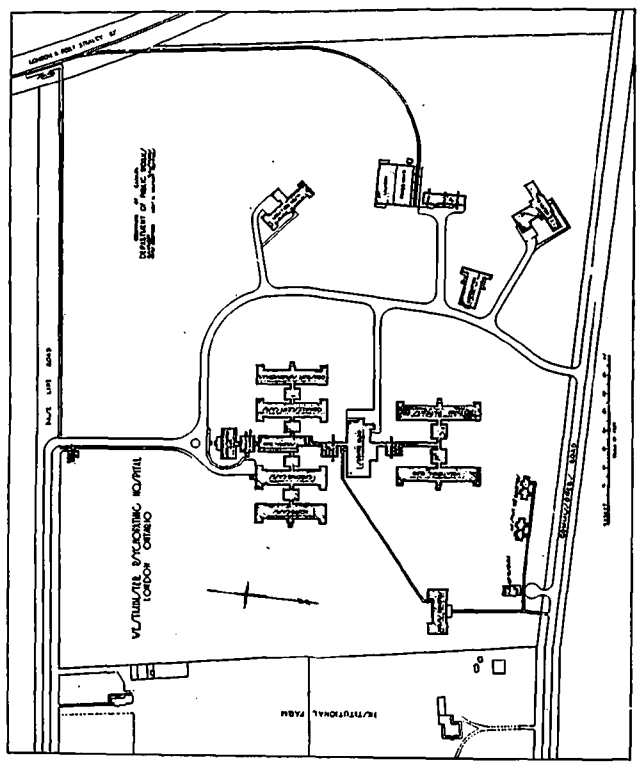


FIG. 7—BLOCK PLAN, PSYCHOPATHIC HOSPITAL, LONDON, ONT.

the thought was ever uppermost in the minds of all concerned as to their future welfare. This instituted what is known as the Vocational Branch under whose supervision was the work of industrial re-training and occupational therapy. This endeavored to reach beyond the physical aid and presented a two-fold value in that it aided recovery as well as equipping the patient for useful service after leaving the hospital.

Not the least interesting phase of the designing of these hospitals has been the grouping of the buildings. Every site, of course, presented its own problems, and the study given to the Block plan has contributed in no small degree to the successful working out of the schemes.

From the illustrations (See Figs. 7, 8, 11,

12 and 13) it will be noted that no two are alike, or even similar, while they all embody the same general requirements.

There is the main approach, with in most cases the Guard House. Then the Administration building around which the others are grouped, and in which accommodation is provided for the Officer Commanding and his staff, the matron, bursar, etc.; the Service building containing the kitchen and dining-rooms, and the required number of ward buildings. The several units of this main group are all connected by corridors or covered ways, and then around this, conveniently placed on the site, are the homes for nurses, orderlies, medical officers, and at the larger centers a recreation building and vocational training building.

DINING ROOM, STE. ANNE DE BELLEVUE, P. Q.

As the reader can readily realize, one big problem in our rigorous climate was that of heating, and the manner in which that problem has been overcome is one of the noteworthy fea-

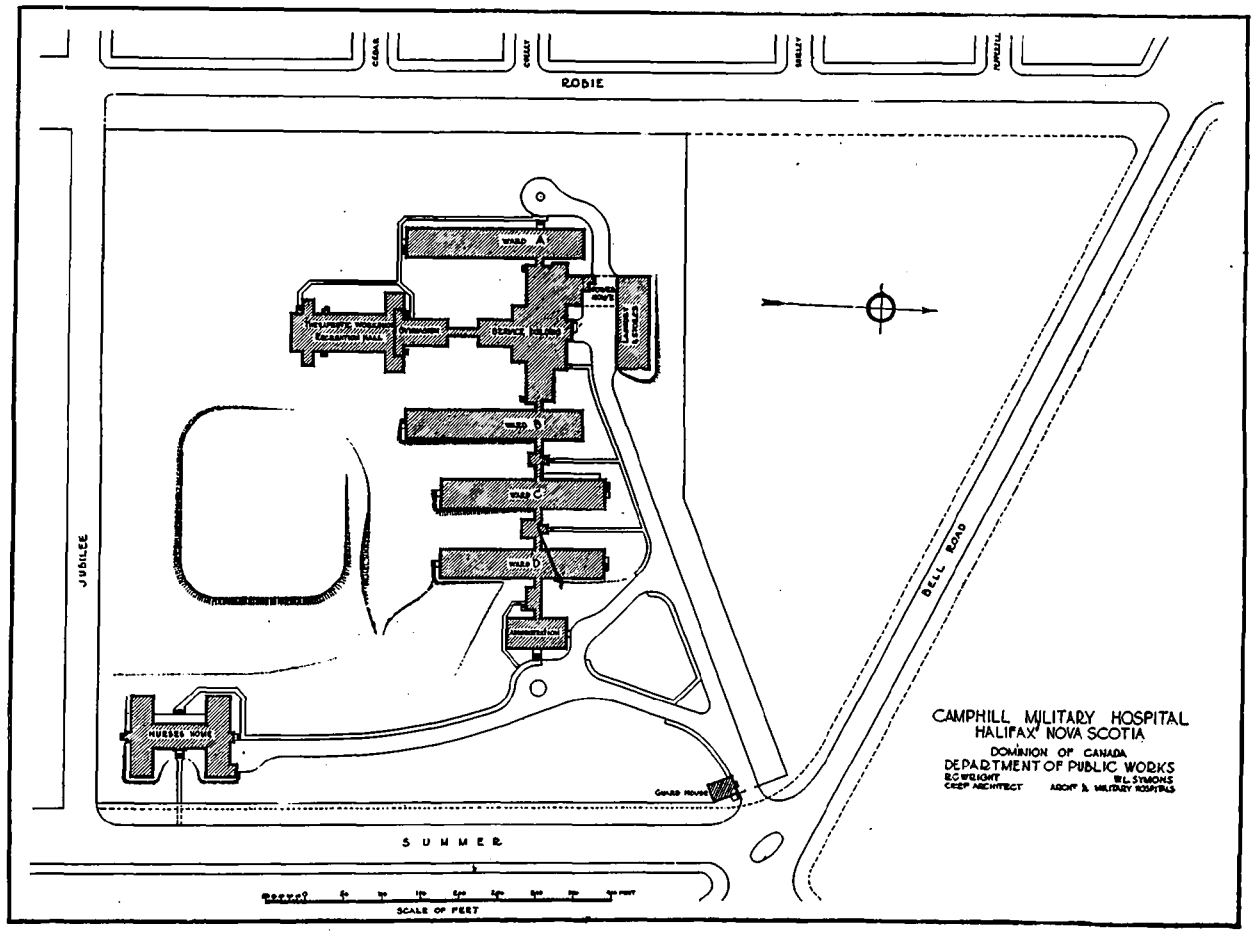


FIG. 8—BLOCK PLAN, CAMPHILL MILITARY HOSPITAL, HALIFAX, N.S.

tures of these institutions. The buildings are all heated by steam supplied through tunnels from a central heating and power plant.

To solve the fuel supply question an effort was always made to locate on or close to a railway siding. The most unique case is at Ste. Anne de Bellevue where the tracks are laid right over the coal bunkers. Then, too, there were other engineering problems. If the hospital was located within, or adjacent to a municipality having all the public utilities, the question of water, light, sewage disposal, etc., were simple; otherwise systems had to be installed in connection with the central heating plant.

The esthetic has not been overlooked in the attempt to secure the best results, and the most possible has been made of the simple materials used. The color scheme in general use is as follows: In the wards the main walls are a light buff, with dado a deep buff and ceilings cream. In the utility rooms the woodwork is finished in dead white enamel, while the nurses' rooms are treated with various shades of sage green, light delf blues, etc. The kitchens and service rooms

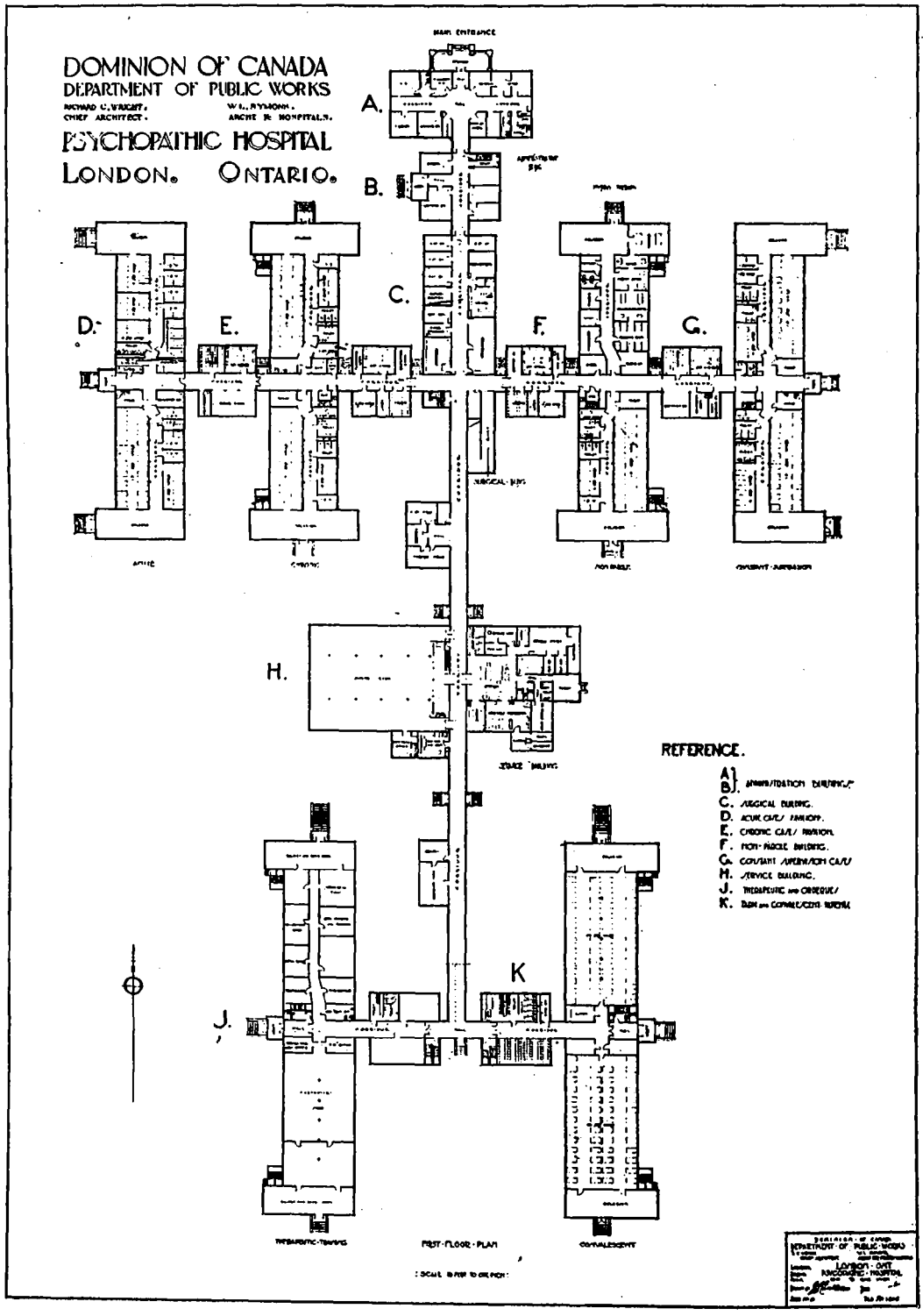


FIG. 9—FIRST FLOOR PLAN, PSYCHOPATHIC HOSPITAL, LONDON, ONT.

are finished in flat cream white, and dining-rooms generally in tones of sage green and brown.

The buildings erected at London for psychiatric work deserve a passing note. As this institution was to be permanent, a greater efficiency in planning was aimed at, and the plans evolved were made in consultation with experts in that particular work.

The Dominion Orthopaedic Hospital in Toronto is also regarded as a permanent institution. The orthopaedic cases not only receive treatment whether surgical, electric or massage, but all appliances requisite for each separate case are made here. In planning the main hospital building the architects were in constant advice with experts in orthopaedic work; the plan thus evolved will prove of interest to those specializing in orthopaedic cases.

Besides the special accommodation for psychiatric work at London, and the orthopaedic work at the Hospital in Toronto, accommodation was also provided at Ste. Anne de Bellevue for oral and facial cases.

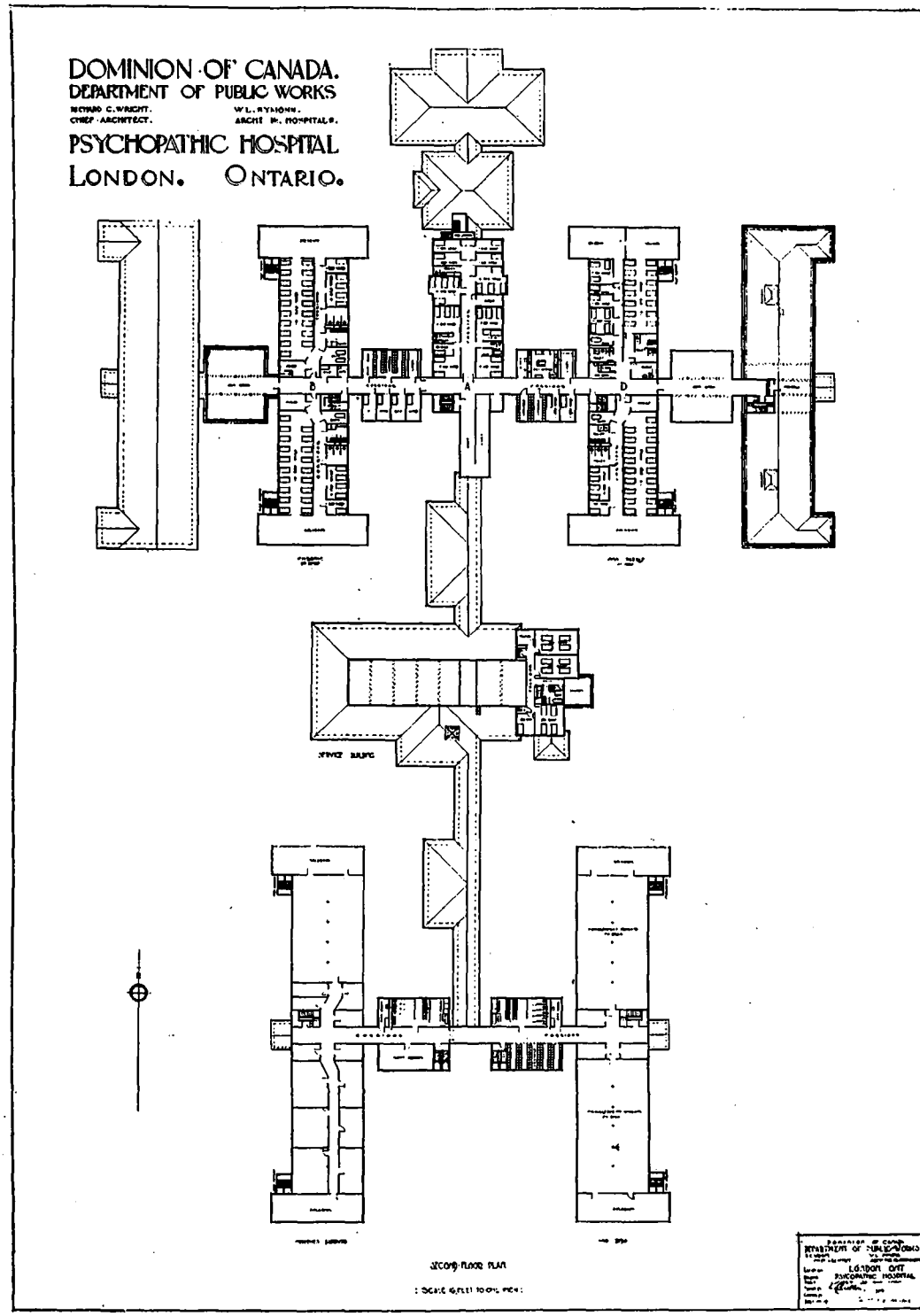
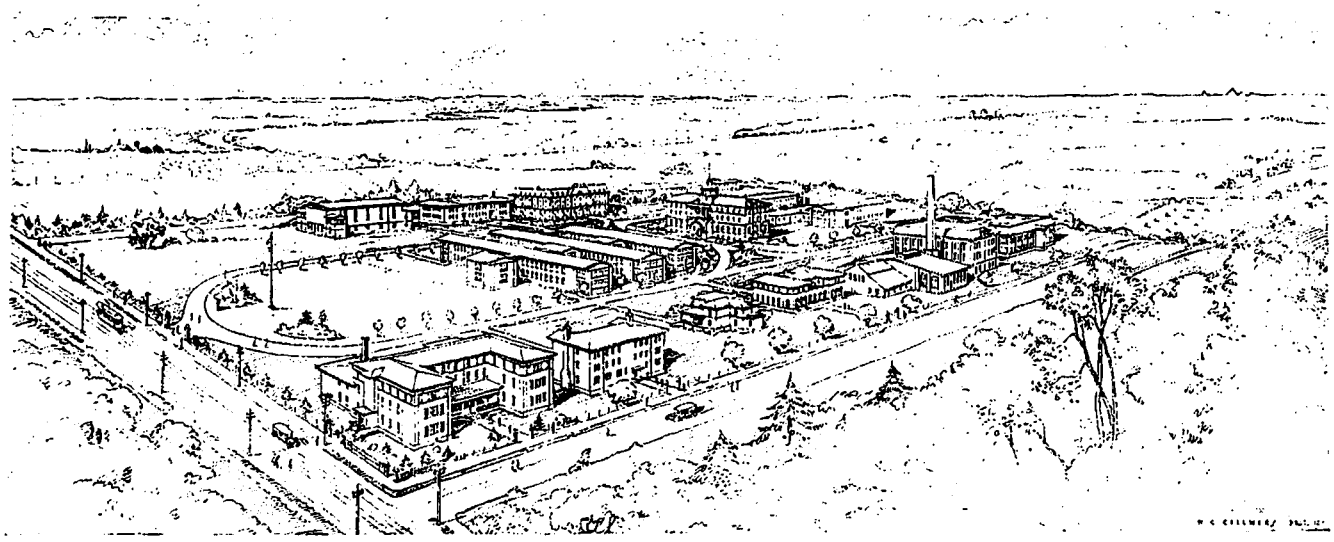


FIG. 10—SECOND FLOOR PLAN, PSYCHOPATHIC HOSPITAL, LONDON, ONT.



TUXEDO PARK MILITARY HOSPITAL, WINNIPEG, MANITOBA.

The buildings required for the care of the tuberculosis patients call for a separate article, but it may be mentioned in passing that accommodation for 750 patients was erected by this department exclusive of the additional buildings erected in connection with the Provincial sanatoria.

It is indeed gratifying to know that the design of the military hospitals has been so thoroughly worked out as to command the attention of other countries. Especially is it pleasing when one realizes that this large problem had to be solved in the western hemisphere without any precedent. Our friends to the south have more than once expressed their appreciation of Canada's work in this direction and frankly admit the value accruing to them from her painstaking efforts. This is due wholly to our early advent into the war which furnished the opportunity of demonstrating our ability to grasp a problem of such magnitude in a broad and wholesome manner.

The task demanded speed and thoroughness. It was not sufficient, in itself, to provide merely a shelter—the relation of the patient, food and treatment had to be considered with the fewest possible intervening motions. The site with its environment, its accessibility to friends and visiting physicians; its remoteness from disturbing influences; its privacy, was another potent factor. The impression conveyed by the appearance of the buildings as well as their general relation to each other was only another of the essential considerations. These, with many others made the matter in hand a stupendous undertaking and brings just credit to the Canadian people through the successful efforts of those upon whom this burden fell.

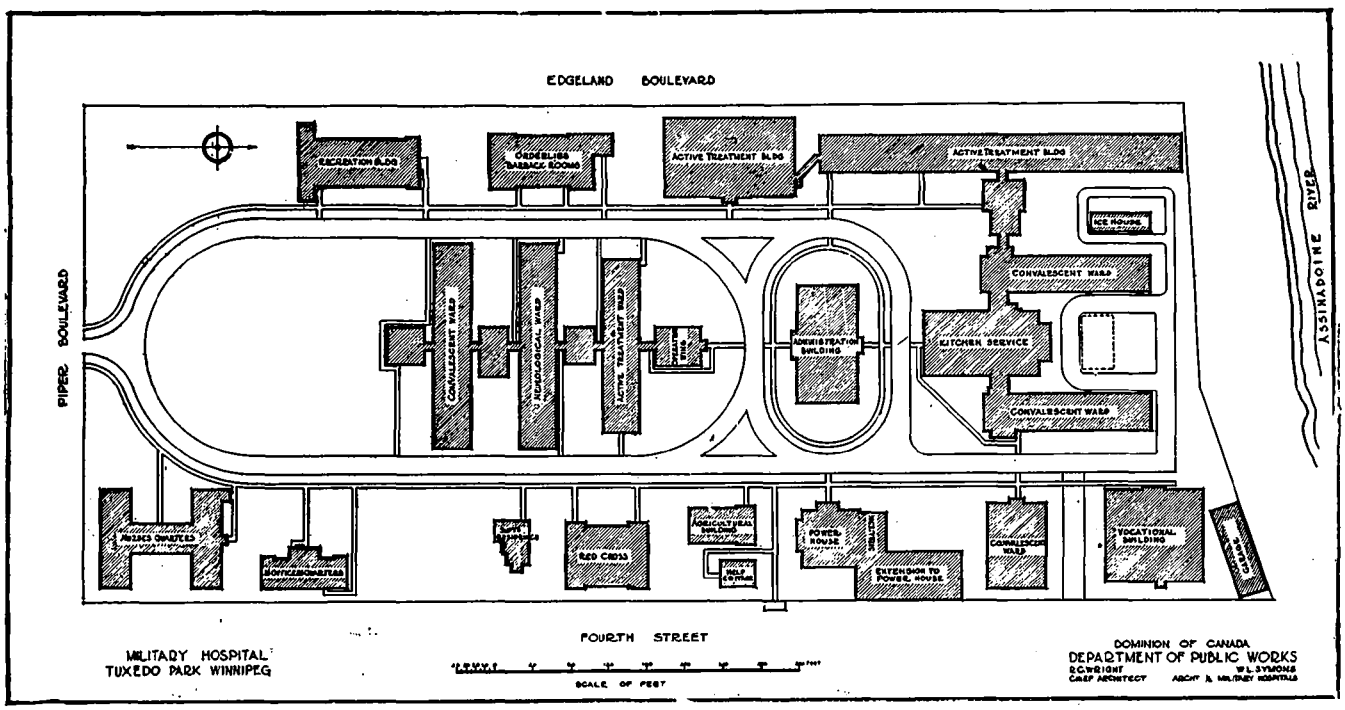


FIG. 11—BLOCK PLAN, TUXEDO PARK HOSPITAL.

In other words, the military hospital work in Canada was a problem of its own, and very little assistance in its development could be obtained by studying the buildings in France or England, and the Americans were too late in the war to be of any service in this respect. They developed a one-storey hospital scheme when later it was realized that two-storey buildings were more adaptable on account of administration, maintenance and cost of erection, while in Canada the first pavilions erected were two storeys, and this scheme was carried out through the entire war time, the original plans only being altered from time to time as new requirements arose.

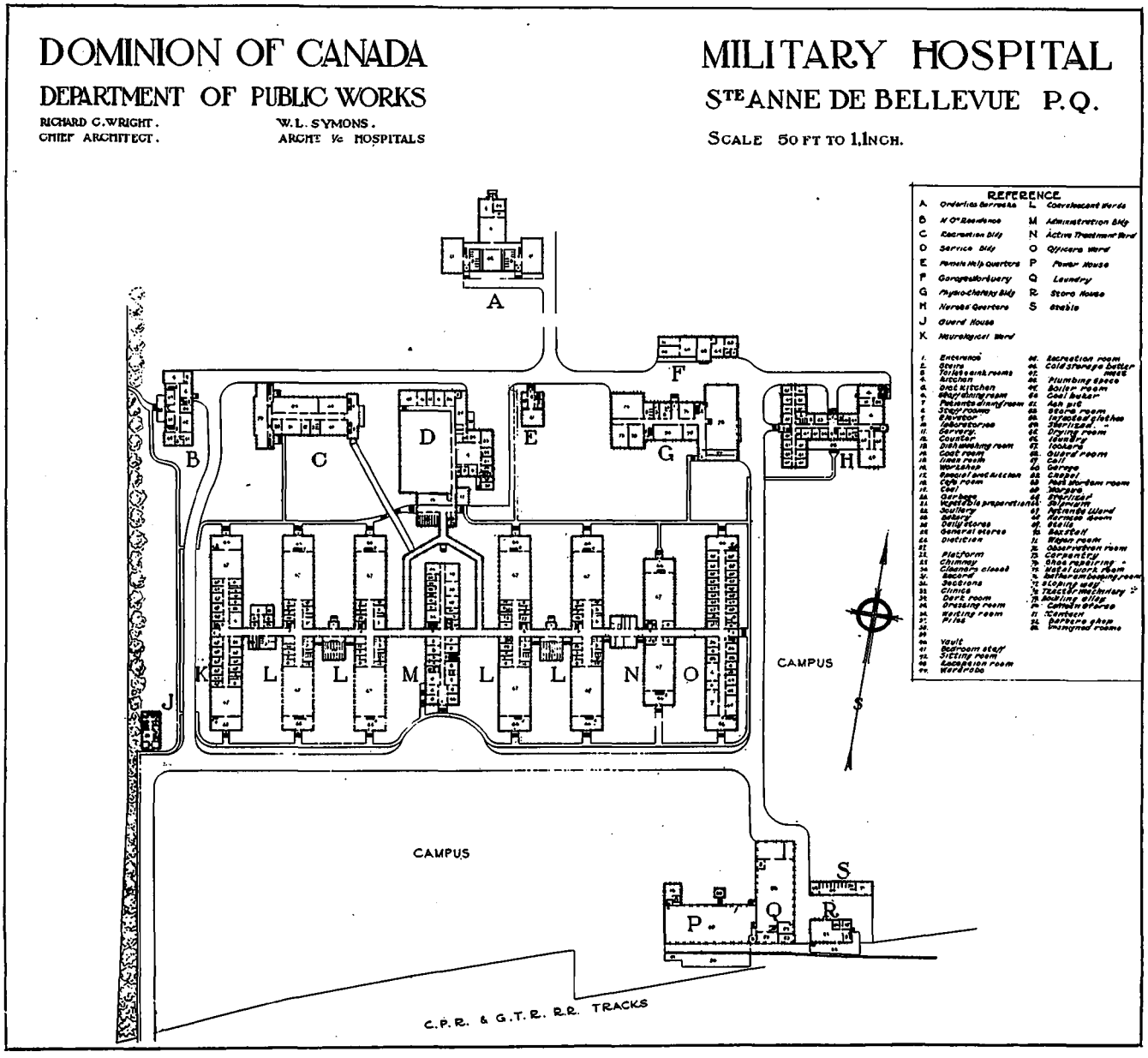


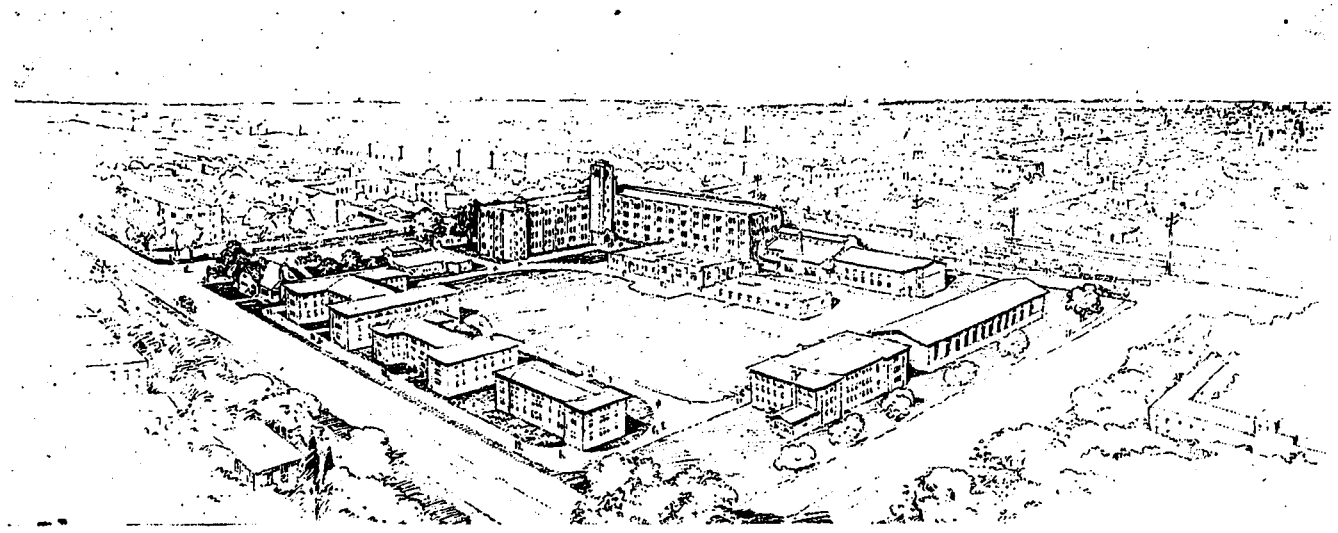
FIG. 12—GENERAL PLAN OF MILITARY HOSPITAL, STE. ANNE DE BELLEVUE, P. Q.

COST PER PATIENT'S BED.

The cost of the buildings per patient's bed in the hospitals was approximately $1,650, in this cost being included the pro rata portion of all buildings on the Campus, and all utilities such as heat, light and water service, and also grading, road making and fencing. The cost of the hospital at London, on account of being of more permanent construction was about $2,500 per bed.

In regard to the cubic contents of the wards per bed, an average of 650 cubic feet per patient at least was maintained at all centres, and a window surface of 25 per cent. of the total wall space in each ward.

Some idea of the extent of the programme of military hospitals work may be obtained when it is realized that about $15,000,000 has been spent by the Government in this work, the bulk of the buildings being erected and equipped in the short space of 18 months time, and that this work was carried on in over eighty different hospital centres in cities and towns throughout the Dominion.



TORONTO ORTHOPAEDIC MILITARY HOSPITAL.

SUMMARY.

Considering the magnitude of the project and the manifold and varied problems entering into it, the erections of war time hospitals, especially in connection with the planning of the various departments, presents certain experiences which should have an important bearing on future hospital design in general. One of the most outstanding of these was constant changes in plan necessitated by the wonderful strides made during the war in all branches of hospital work itself. This was very noticeable in the X-ray and electrical treatment departments, and also

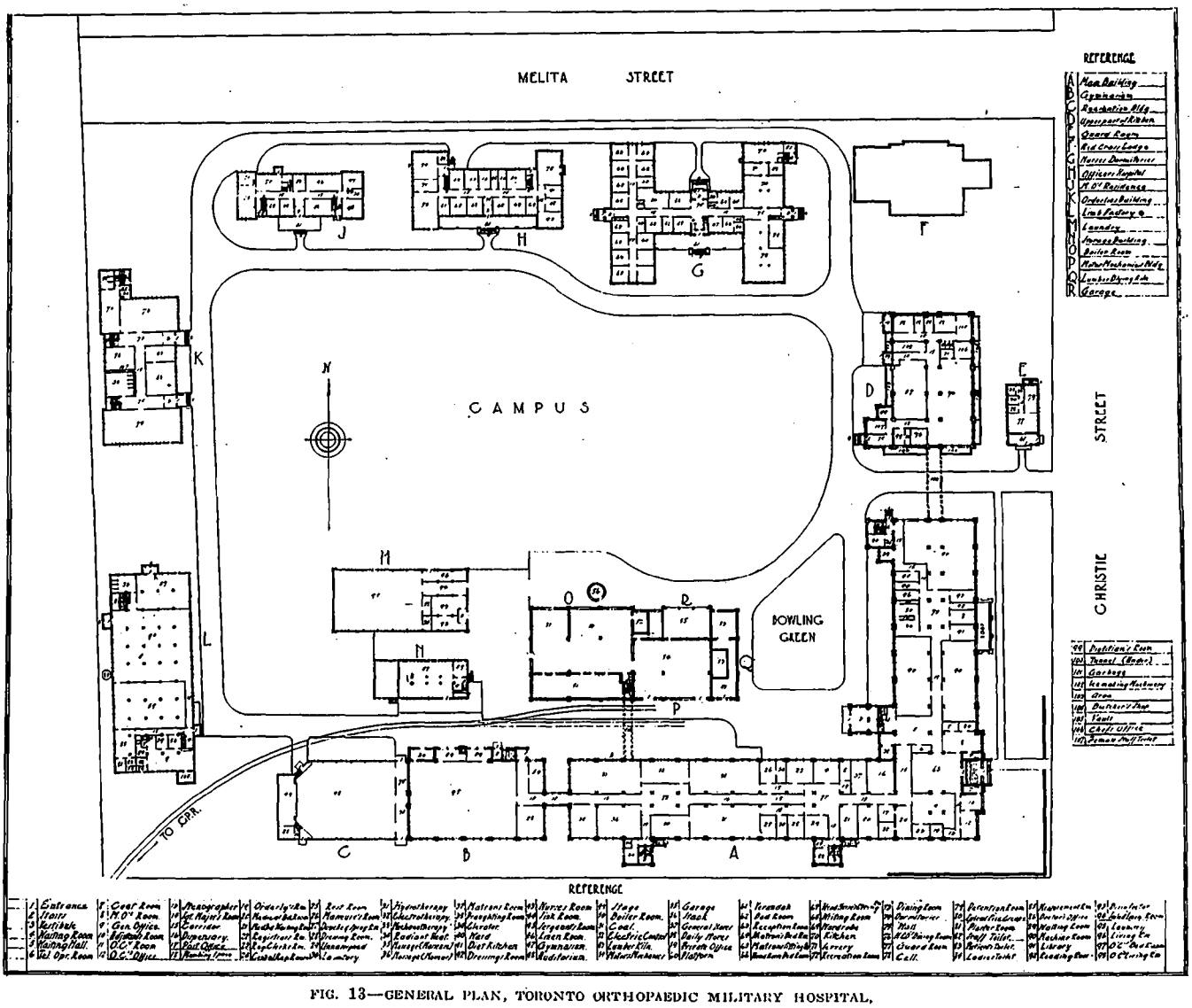


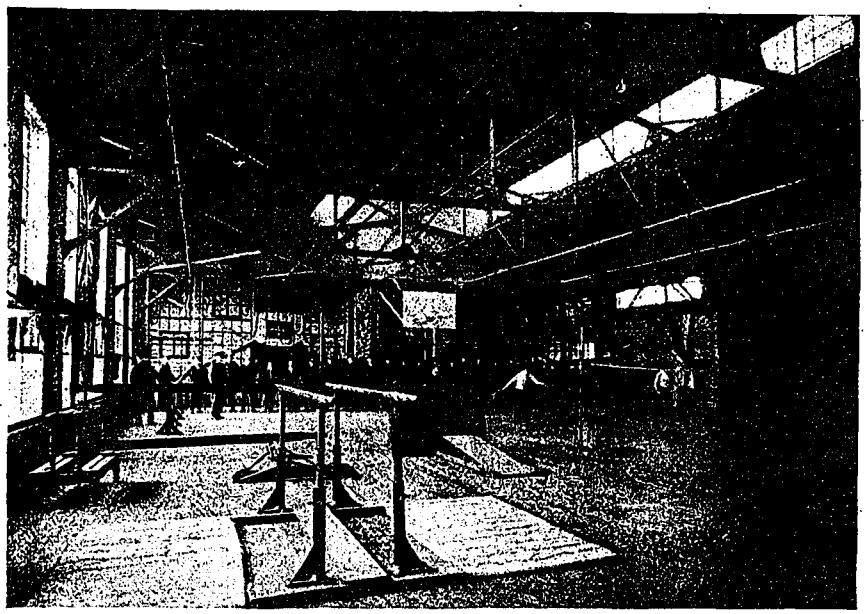
FIG. 13—GENERAL PLAN, TORONTO ORTHOPAEDIC MILITARY HOSPITAL.

the hydrotherapy and massage departments and equally noticeable in the application of the work of these branches to psychiatric work, and in a lesser extent to that for tuberculosis treatment.

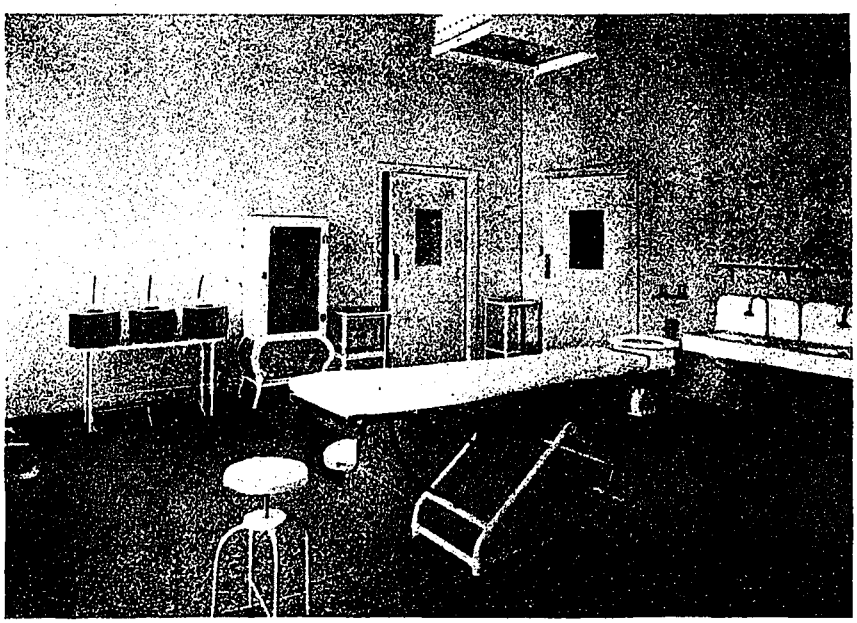
The development in providing for the housing and treatment of infectious diseases should prove of interest and value, and also that for the venereal hospitals which were almost unknown before this time, and consequently may be termed a war product.

The application of vocational training to mental and tubercular patients has necessitated considerable space being set apart for this important work, in some cases separate buildings being erected, while the provision of special gymnasia in connection with orthopaedic hospitals has opened up an entirely new study.

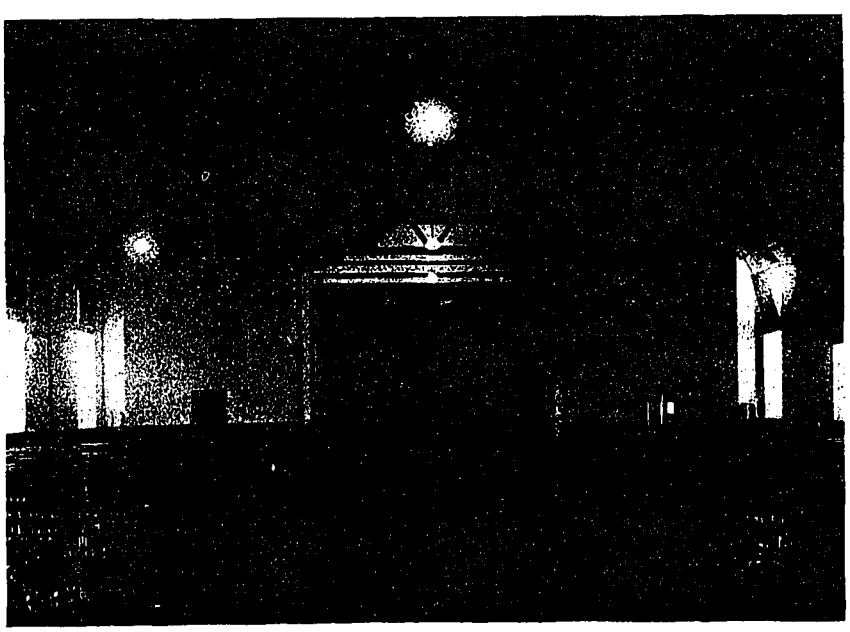
The question arises as to how far it is desirable to erect expensive buildings such as five and six-storey fireproof structures, in view of the fact that the requirements in the various departments are far from being standardized. Even the question of ward planning is still a much discussed one among medical men. Some leading doctors quite firmly maintain that the erection of two or three-storey buildings of slow burning construction is to be recommended, so planned as to be easily and quickly altered to suit important changes which are subsequently found to be necessary and desirable. In fact it is now quite fully realized that the plan and equipment of mental and tubercular sanitariums erected even as recently as ten years ago, and carefully planned at the time, fail in a large measure to meet present hospital requirements, and on account of the initial cost of the original structures, which in most cases still bears heavily against them, the administrators of these buildings find it both difficult and costly to carry out alterations desired by the medical advisers.



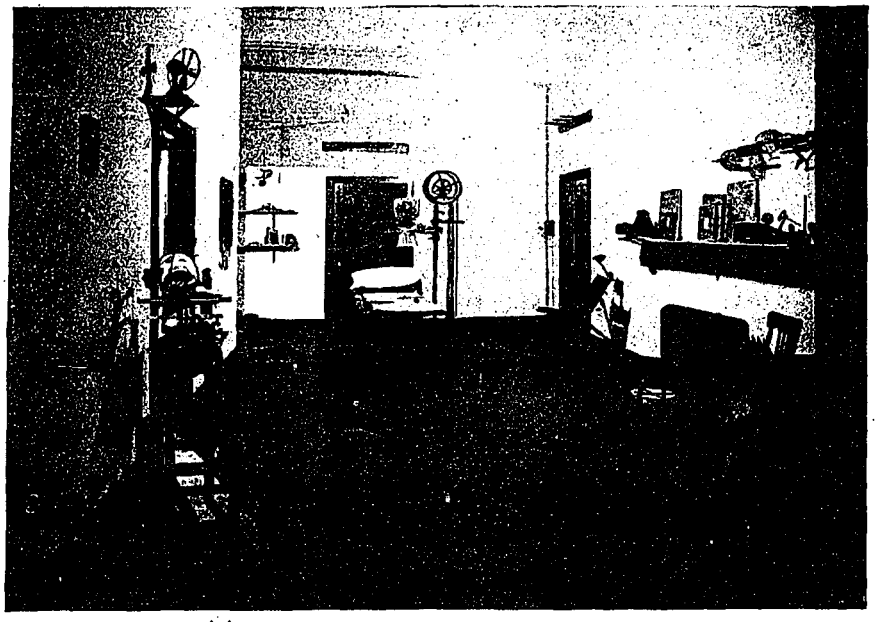
GYMNASIUM, TORONTO ORTHOPAEDIC MILITARY HOSPITAL.



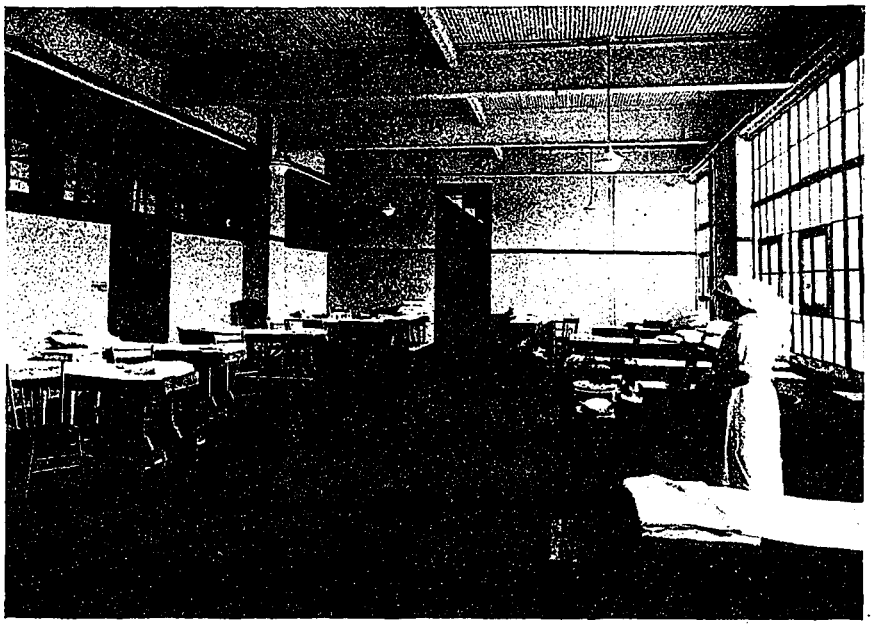
OPERATING ROOM, TORONTO ORTHOPAEDIC MILITARY HOSPITAL.



RECREATION HALL, TORONTO ORTHOPAEDIC MILITARY HOSPITAL.



X-RAY OPERATING ROOM, TORONTO ORTHOPAEDIC MILITARY HOSPITAL.



MASSAGE DEPARTMENT.

ARM AND LEG BATH AND CONTINUOUS BATHS, HYDROTHERAPY DEPARTMENT.

Consequently in the interests of economy and effective administration it would seem that the lesson to be learned from the erection of military hospitals in Canada is the suitability of two-storey and basement buildings for hospital work of all kinds. The low cost of $1,650 per bed for heavy wooden construction and $2,300 per bed for slow burning construction (this is war-time cost), combined with the ease and cost of administration if the buildings are properly placed in relation to each other, and the apparent low fire hazard as indicated by the fact that no loss of life or property damage from fire has been sustained during the time these hospital units have been in operation, all constitute arguments that favor large acreage for hospital sites and two or three-storey buildings.

Besides this there is another reason why these buildings should have considerable effect on future civic hospital planning and equipment, and that is the fact that they were erected, equipped and maintained out of Government monies and were thus not dependent upon civic or personal donations. Advantage was therefore taken of this fact, especially as regards equipment, to have the best that scientific research could devise or provide for the aid and recovery of the large number of patients receiving treatment. New standards have consequently been created both as regards planning and equipping which are at least revolutionary, and which will undoubtedly greatly influence all future work along these lines.

Very little loss, if any, will ensue in Canada chargeable against the expenditure of fifteen million dollars for military hospitals, as most of the buildings have been erected on permanent foundations and in such a manner as to admit of the future exterior facing of stone or brick to the upper storeys. Some hospital centers will be turned into military hospitals and bar-

racks for the Permanent Force, others will be taken over for special work, such as mental hospitals for women and children, and altogether their planning, construction and equipment will demand that they be utilized for some good service.

In other words Canadian citizens have every reason to be grateful to find that after the "smoke of battle" they have such an unimpaired asset, in that these buildings besides fulfilling the needs of the purpose for which they were erected, have been so carried out as to enable them to successfully serve a more general use which in every way renders them of permanent value.

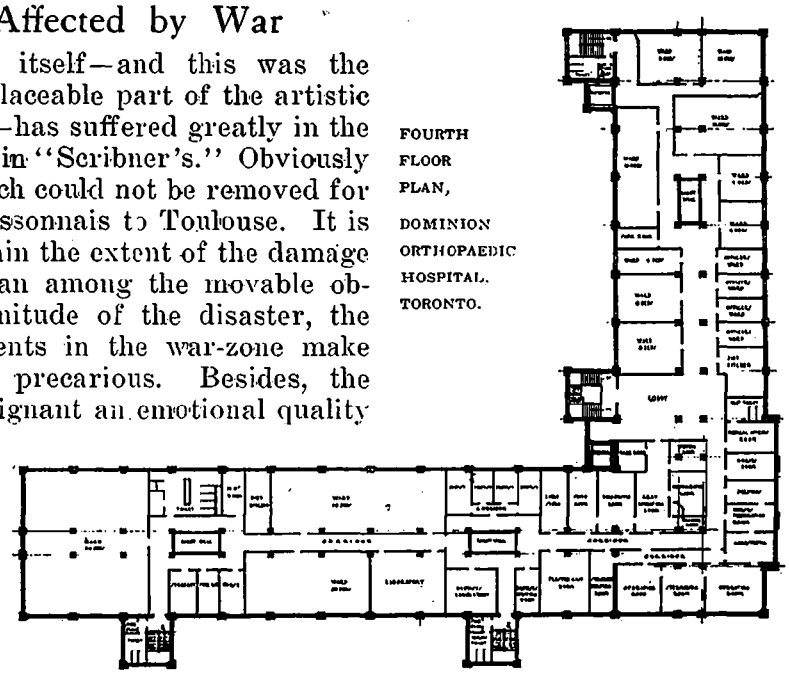
French Architectural Treasures Seriously Affected by War

The architecture itself—and this was the most precious irreplaceable part of the artistic heritage of France—has suffered greatly in the war, states a writer in "Scribner's." Obviously a Romanesque church could not be removed for safety from the Soissonnais to Toulouse. It is far easier to ascertain the extent of the damage among churches than among the movable objects, but the magnitude of the disaster, the number of monuments in the war-zone make precise statements precarious. Besides, the ruins possess so poignant an emotional quality that there is an almost unavoidable tendency to exaggeration. I was told the other day on excellent authority that the Germans had prepared mines to blow up the Abbey of Ourscamp, and found the holes in question, which, however, had been drilled over a century ago to receive the choir-rail. Such false reports are unfortunate, since they tend to discredit the authentic instances of atrocities that indubitably exist. I have seen with my own eyes proof that the Germans, at the time of their retreat, did deliberately blow up the churches of Boult-sur-Suippe, Heutregeville, and Betheniville, all of artistic importance.

The zones of destruction are singularly uneven. In general it is in the country churches, rather than in the great cathedrals, that the loss has been heaviest. It is clear that, with the exception of the cathedral of Rheims, comparatively little irreparable harm was done in 1914. It is along the lines held for a long period between 1914 and 1918 that the damage is most appalling. The bombardment seems to have increased in intensity as the war went on. The armies came to depend ever more upon heavy artillery and to use it more recklessly. East of Rheims where the line was nearly stationary for four years, there remain of the former villages only heaps of masonry. Even the sites of important churches, like Cernay-les-Rheims, can hardly be determined. One hunts among formless heaps of stone until one finds a voussoir from a rib or a capital then one knows one is standing where was once the church. The damage was also heavy during the advance and retreat of the Germans in 1918, as for example, in the beautiful little church at Crezancy.

A Secret of Bad Building

A correspondent of "The Times" of London, says: "Anyone who has been engaged in drawing and measuring a mansion, say of the seventeenth or eighteenth century, must have been struck by the opulent scale and proportion of its details as compared with the most costly building of the same class erected in the present day. Yet the difference may be traced rather to a system than to any conscious intention on the part of architects, builders, and clients. In a word, the present-day building is erected 'by contract'; the seventeenth-century building was not.



FOURTH FLOOR PLAN, DOMINION ORTHOPAEDIC HOSPITAL, TORONTO.

"Where first the idea took possession of the mind of the building owner that he must know the exact cost of his building in advance and obtain a legal contract for the carrying out of it for a specified sum, the building contractor, of course, for the protection of his own pocket, must know exactly what amount of each material used in the building he had to supply; hence arose the operation called 'taking out the quantities.' In the first instance this quantity-taking was done by the builder at his own cost, as a means of self-protection. But the time came when the builders, as a class, rebelled against this tax on their time, and required the 'quantities' to be supplied to them at the cost of the building owner. Hence arose the separate profession of the 'Quantity Surveyor.' Now on top of all this comes the desire of the building owner to get his building as cheap as possible; so the quantities are supplied to a selected num-

ber of builders, who are invited to state respectively for what sum they will carry out the building, and (unless there has been a special *caveat*—'the lowest tender not necessarily accepted') he who will do it cheapest is selected, with the result sometimes that the selected builder leaves himself so narrow a margin for profit as to be under a painful temptation to scamp the workmanship in some way not too obvious to the eagle eye of the architect.

"Thus architecture, which should be a great and noble art for the embellishment and pride of cities, and carried out with that object preeminently, is reduced to a kind of business of getting a presentable result at the least possible cost, and in general, it may be added, in the shortest possible time, for in too many cases (in town architecture especially) a new building is regarded by its promoters not as architecture but simply as 'property'; on which money has been expended, and which must be hurried up in order to make money returns out of it as early as possible. An essentially commercial generation may argue that this is the only logical, reasonable, and business-like method of procedure. It may be business, but it is not architecture. Not on such a system will arise such a civic architecture as will leave 'no complaining in our streets.' No great architecture ever has been or ever will be produced on the basis of building as fast and as cheaply as possible."

Commenting on the foregoing, the "Architect," of London, says that with much of this, many builders and most architects will be in complete agreement; but the unduly heavy scantlings used in the seventeenth and eighteenth centuries were consequent on a very rudimentary knowledge of stresses.

Ontario Housing Report

PROGRESS made under the Ontario Housing Act is reviewed in a report issued by the Bureau of Municipal Affairs, which contains a large amount of general information based on the practical application of the Act since it came into operation.

According to the report there are now ninety-nine municipalities which have passed by-laws under the provisions of the act and appointed housing commissions. Of these, nineteen are cities, forty-nine towns, seventeen villages, and fourteen townships. Sixty-eight municipalities have constructed houses. All these contemplate construction on a much larger scale this year. In addition, all the municipalities with two exceptions, which have not yet constructed houses, intend to do so this year.

This does not include the city of Toronto, which carried on operations independent of "The Ontario Housing Act," under a Housing Commission of its own, and which has constructed a number of houses, the financing of which has been done by the city itself.

The report also refers to a number of private companies which have incorporated under "The Housing Commission Act" for the purpose of erecting houses at Hawkesbury, Hamilton, Fergus, Iroquois Falls, Listowel, Kitchener and Waterloo. Riordon Annex Housing Company, Ltd. (Hawkesbury), the Fergus Housing Co., Ltd., Iroquois Falls Housing Co., Ltd., and the Listowel Housing Co., Ltd., are the only ones, however, which have so far carried out housing developments.

Regarding the matter of appropriations, it is pointed out that the total amount appropriated to municipalities by the province in 1919 was $10,629,000. Of this, $5,125,000 was appropriated to seventeen cities; $3,649,000 was appropriated to thirty-nine towns; $735,000 was appropriated to sixteen villages, and $1,120,000 was appropriated to eleven townships.

It is estimated that if all the requirements of the various municipalities for 1920 are met, $8,000,000 will have to be provided in addition to the above stated amounts. A large number of municipalities which constructed a small number of houses in 1919 are contemplating large developments this year, providing a sufficient appropriation can be made to cover their requirements.

Considering the short period that the act has been in operation and the fact that it represents an entirely new experiment in Canada, very substantial progress has been made. This is indicated in the following summary which shows the number of houses erected, their accommodation and physical character, the total loans granted and the average loan per house.

It will be seen from the above summary that of the dwellings erected 1,060 are detached houses and 124 semi-detached. It also shows that 62 per cent. of the houses erected are either brick veneer or of other type of solid construction.

The average loan per house indicates that there is a reasonable margin of security in the loans made. About two-thirds of the houses have been erected by persons who own their own lots. While it was possible for persons possessing their own lots to obtain loans for the full cost of the house, in a large number of cases the loans have been made for less than their full value. In houses built under this plan those

building them were privileged to make their own contracts for construction. Working men were also allowed to do part of the construction work themselves, and this has been done in many cases. The department has encouraged this method. Persons wanting houses have each obtained the particular kind of house which they desire subject to the minimum requirements of the department. There has been no effort to force upon people any particular style or type of houses. These methods, the administration feel, are largely responsible for the success which has so far been obtained under the Ontario Housing Act.

"Special attention has been given to the planning of the houses on the point of view of having no space wasted in unnecessary halls or passages. It has been the endeavor to have every inch of space in the house made available for living purposes. The houses have been planned so as to secure the maximum accommodation at the minimum of expense. They have also been planned so as to give as little labor as possible in connection with the care of them. The housewife has been saved all possible unnecessary going up and down stairs and travelling from one room to another, and the kitchen has been arranged so as to give her the minimum of labor there."

Summary showing total loans granted and the average loan per house for dwelling already erected.

No. of houses		Loans.	Average loan per house.
14	Four roomed, frame, clapboard finish	$ 27,700.00	$1,978.57
3	" solid brick, hollow tile or concrete	7,575.00	2,525.00
43	Five roomed, frame clapboard finish	115,489.00	2,685.79
26	" frame, stucco finish	77,050.00	2,963.46
23	" brick veneer	67,270.00	2,924.78
44	" solid brick, hollow tile, or concrete	124,630.00	2,832.50
237	Six roomed, frame, clapboard finish	662,299.00	2,794.09
88	" frame, stucco finish	257,274.00	2,923.57
230	" brick veneer	678,228.00	2,948.82
332	" soid brick, hollow tile, or concrete	1,185,000.00	3,569.28
13	Over six rooms, frame, clapboard finish	37,100.00	2,854.61
27	" frame, stucco finish	81,000.00	3,000.00
23	" brick veneer	56,675.00	2,464.13
81	" solid brick, hollow tile, or concrete	300,684.00	3,712.16
1,184		$3,677,974.00	$3,106.40

LAND VALUES AND DIMENSIONS OF LOTS.

As to the matter of sites for dwellings built under the Act, small and narrow lots have been discouraged. While in Toronto and vicinity the values of lots are unusually high, comparatively speaking, there has not been much difficulty in securing land at reasonable prices elsewhere in the province for housing purposes. In this respect, according to report, the special provisions of the Housing Act in regard to the appropriation of land for housing purposes have been very effective. There have only been two arbitrations under these provisions, but the very existence of them has in a great many municipalities enabled lots to be purchased at a reasonable price, where otherwise this might not have been the case. As a rule, outside Toronto and its vicinity and the Windsor district, the lots used for housing purposes under the Act are not less than 40 feet frontage by 100 feet in depth.

As to the extent and value of land purchased for the purpose of erecting houses by the respective commissions, as well as the average cost per lot, this is set forth as follows:

Value of land in various parts of Ontario, as based on sites purchased by local commissions for the erecton of houses.

			Averaging, per lot.
Acton	7 lots for	$ 2,000.00	$285.71
Brantford	10 " "	3,000.00	300.00
Elmira	4 " "	640.00	160.00
Galt	5 " "	1,250.00	250.00
Guelph	11 " "	2,830.00	257.27
Hawkesbury	33 " "	9,900.00	300.00
London	9 " "	2,350.00	261.11
Milverton	8 " "	1,400.00	175.00
New Toronto	48 " "	22,368.75	466.02
Oshawa	153 " "	24,825.00	162.25
St. Catharines	22 " "	4,645.00	211.14
Sudbury	17 " "	10,200.00	600.00
Welland	4 " "	1,425.00	356.25
Ottawa, 42 acres (or 328 lots)	" "	162,000.00	493.90
Total	659 " "	$248,833.75	$377.59

"In the case of Ottawa the price of land includes $40,000 for the laying out and development of it by the commission. The average price of $377.85 per lot is approximately $10 per foot frontage, and is reasonable. Where blocks of land have been purchased, these have been subdivided, laid out and developed. A considerable portion of this land has not yet been built upon. It is proposed to do this in 1920. Several other commissions are also contemplat-

ing the purchase of similar blocks of land for housing purposes."

The price of the houses erected throughout the province under the Act includes, in each case, hot air, heating, plumbing, bath-room equipment, and all other charges necessary for a complete house, the loans granted in a large number of cases approximating the cost of the buildings.

With reference to the advance in prices as regards materials and labor, the report states that the cost of constructing houses is now, taking an average of every province, about 125 per cent. greater than before the war. Lumber has so greatly increased in price that a stage has been reached where the cost of erecting a house of solid brick is not a great deal in excess of one of frame construction. It therefore urges on the grounds of durability and saving in maintenance, the advisability of adopting the more substantial type, stating that the comparatively small additional increase in cost of monthly payments over what is required for frame construction, can readily be made by those who are building.

Of the direct benefits accruing to those who have taken advantage of the Act, besides providing much needed accommodation, attention is drawn to the fact in nearly every municipality where houses have been erected the monthly payments for principal and interest, including taxes and insurance, are less than the rental for similar houses in the same municipalities.

REPORT OF CHIEF ARCHITECT.

The report of Mr. James A. Goven, Chief Architect under the Act, forms an interesting part of the summary, both on account of the study which he has personally given to the subject and the fact that all plans have come to his attention for approval. According to Mr. Goven, the various housing commissions operating throughout the province during the past year should be congratulated on the advance they have made and should receive every encouragement to go further in their good work, for which, he states, in too many cases they have received much criticism and no active help from professional bodies which could do so much by co-operating.

A steady improvement was to be noted in the quality of the plans received with each succeeding month, and it was quite evident that where competent professional assistance was obtained by a commission mistakes were avoided, economies effected and results produced which more than justified the expenditure for such service. While co-operation between the local branches of the architectural and are associations, societies, etc., might produce desired improvements, it is not considered that a central bureau to pass judgment on the aesthetic merit or demerit of each plan submitted would not be desirable.

Based on the experience gained through work already carried out, Mr. Govan makes a number of important recommendations which are intended to develope a keen practical interest on the part of the owner in his project, and to effect certain economies in construction and plan.

"Of the total number of loans made last year a large proportion was to individuals for the erection of their own homes. While it is true that this is not an economical way to producing houses in large quantities in a short period of time, there are many reasons for encouraging this phase of the work under the Housing Act.

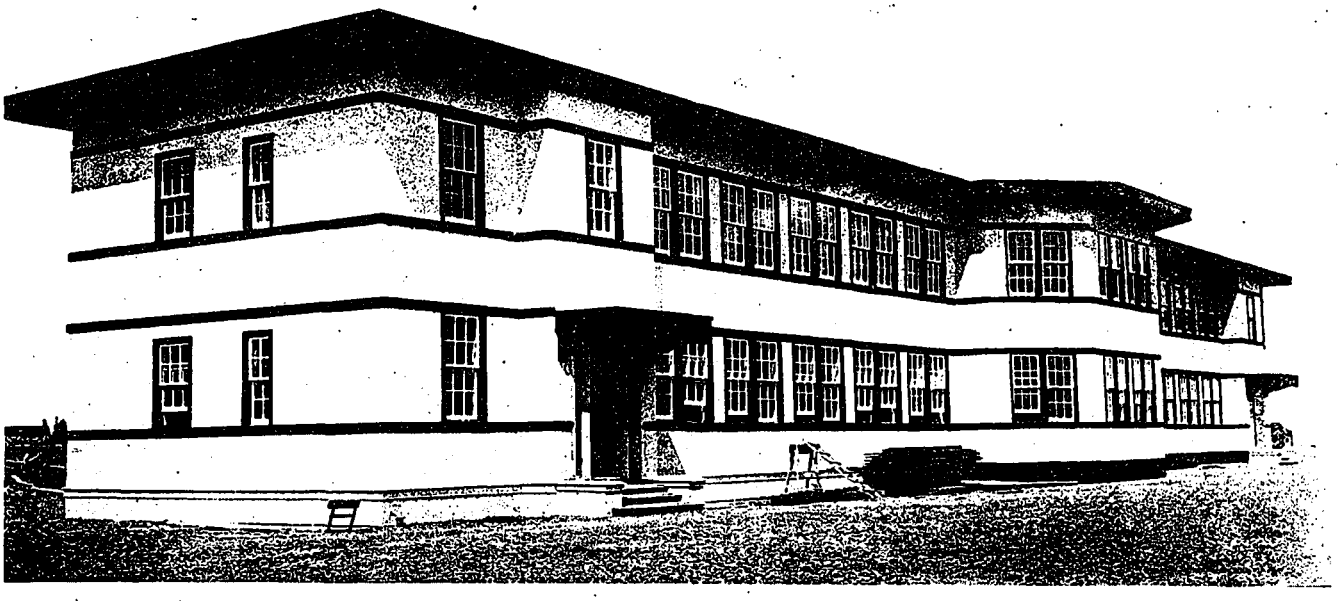
"Splendid results has been obtained by many applicants who have carried out a great deal of work on their own houses. This should be encouraged for at least two reasons, one, to develope craftsmanship, and the other, to help keep down the amounts required for loans. . . . It should be clearly understood that the man or woman contemplating the purchase of a house has a natural interest in its building which is not satisfied by simply presenting him or her with the front door key . . . . . the most lasting satisfaction will be got when they are allowed to exercise some control over the work from the development of their plans to its final realization as a home.

BUILDING HOUSES IN QUANTITIES.

In order to keep costs at a minimum, Mr. Govan advocates the erection of houses in quantities with standardized parts, declaring that this can be done and still provide necessary variety in external appearance. The report also points to the importance where houses are built in quantities of drawing the attention of the local commissions to the fact that in such cases they are not only building houses, but also a community, and the appearance of the street must be considered as well as each house. Continuing, it explains that in a small town the erection of fifty or a hundred houses is a large percentage of the total number in the town. If these houses are attractive they will be an asset, on the other hand, if they are poorly designed and badly situated they will detract from the appearance of the town as a whole, and are apt to become a liability and the beginning of a slum district.

"In some localities bungalows consisting of cellar and all rooms on the ground floor have been erected for less cost than houses of two storeys, having the same accommodation and built of similar materials. The only explanation which can be given is that with the present high cost of labor—the hoisting of materials to first floor and roof more than offsets the cost of the extra cellar and roof areas of the bungalow.

(*Concluded on page* 100.)



EXTERIOR VIEW OF ONE OF THE ACTIVE TREATMENT BUILDINGS ERECTED IN CONNECTION WITH THE ONTARIO HOSPITAL, AT WHITBY, ONT.

Canada's War Hospital Development

By J. H. W. Bower, B.A.Sc., General Superintendent, Engineering Branch.

[Editor's Note.—The following article is a partial reprint from the chapter entitled "The Engineering Branch," by J. H. W. Bower, B.A.Sc., which appears in the official Government publication entitled "Canada's Work for Disabled Soldiers." The original manuscript, which deals with the subject at great length, was too lengthy for entire reproduction here, but an endeavor has been made to give such matter as will indicate the general policy of Canada's war hospitals and the efficient manner in which their design and construction has been carried out by the Department of Soldiers' Civil Re-Establishment.]

THE general considerations which led to the policy of establishing a chain of hospitals has been previously reviewed at some length.

The effectiveness of the policy so established largely depended upon the rapid design and construction of the institutions proposed.

It was realized that this problem was one without precedent in the history of Canada, and that its actual working out must be one of experimentation. At the same time, the experimental stage could not prolong itself into a period of months or years, as the necessities were of an immediate nature, due to the rapid return of disabled members of the Canadian Forces from overseas. The Engineering branch of the Department was, therefore, immediately organized to take care of the work, in order that a central control within the existing organization might handle the many and varied problems that had to be faced.

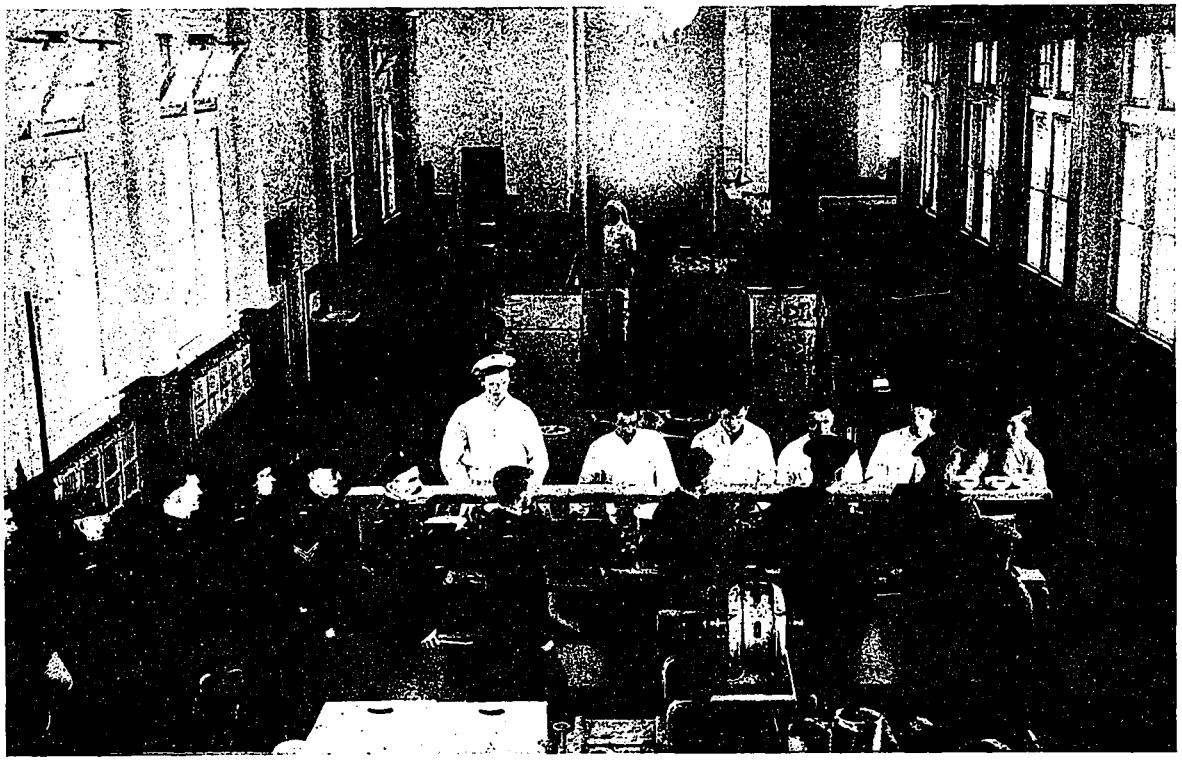
This branch of the work came into being during the fall of 1916, and the success of its work is acknowledged by experts from other countries who have inspected the various institutions throughout Canada.

In Europe, hospital facilities became an immediate necessity at the commencement of hostilities. It may, therefore, be imagined that the large institutions erected for war purposes in France and England would form concrete examples of what should be followed in Canada. By the time the Department was faced with the hospitalization problem, plans and reports from war hospitals in France and England were available. These were surveyed in every detail, but it was found that climatic conditions in Canada prevented the very temporary type of structure from being used in this country. The type of structure generally used throughout England for war purposes, consisted of the lightest one-storey frame construction. The temperate climate of England and France made it unnecessary to have elaborate and complete heating systems installed, and for the same reason, the structural details of their buildings could be of the most temporary nature, provided the general inclemencies of the weather could be guarded against.

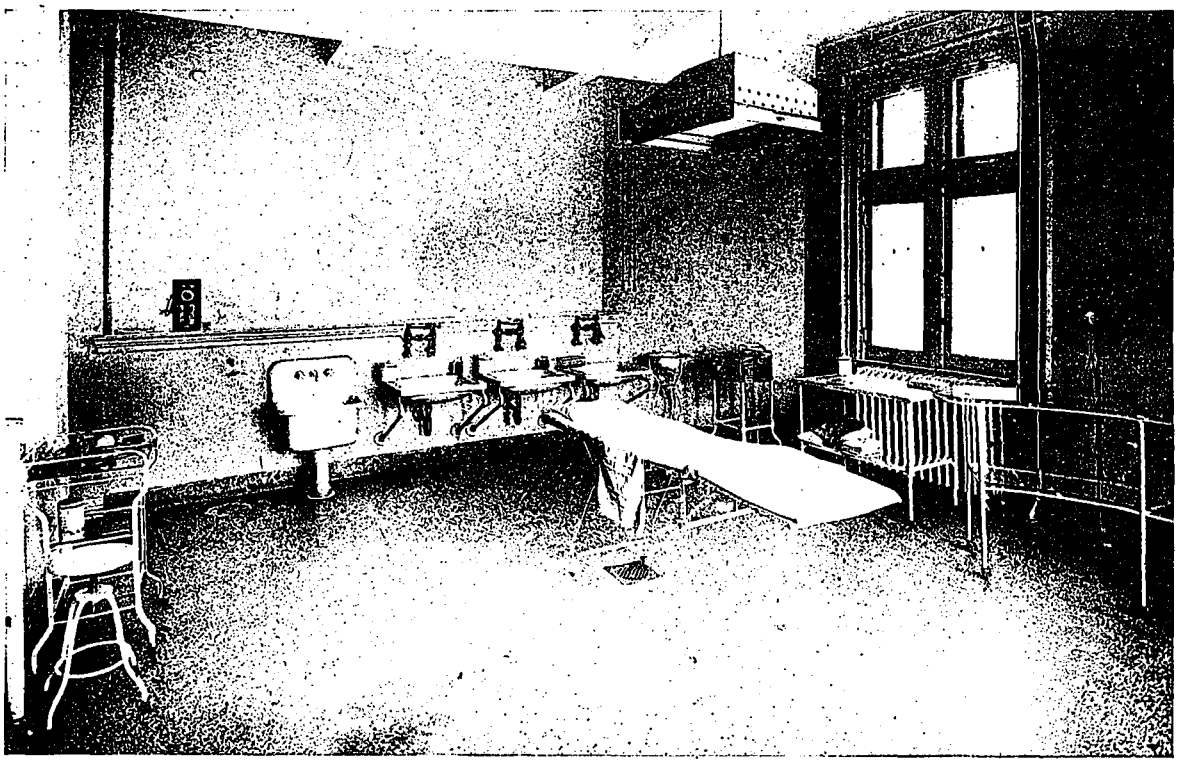
The climate of Canada being subject to great extremes, especially in winter, made it necessary that the institutions which were to care for sick and wounded men must be so constructed that they could be easily and economically heated. At the same time, it was realized that the Government could not justify the construction of institutions of a permanent nature, as a great many of the hospitals erected would only be in use for a comparatively few years.

Thus, the problem which confronted the Department was a unique one without precedent.

On the one hand, the usual type of hospital was out of the question, due to its high constructional cost. On the other hand, the purely temporary building was useless, due to the extreme



VIEW OF CAFETERIA SYSTEM IN ONE OF CANADA'S WAR HOSPITALS.



OPERATING THEATRE, NORTH TORONTO HOSPITAL.

climatic conditions encountered. An intermediary course was, therefore, adopted, and buildings were constructed along lines that might be termed "semi-permanent." It was found that buildings of this nature could be most economically constructed of two-storey heights. Generally speaking, the foundations of the buildings consisted of wooden or concrete posts, supporting a floor system designed to meet the proper loads. The walls of the superstructure were composed of studding, sheeted inside and out with T. & G. boarding, the interior and exterior sheeting being covered with two-ply of heavy building paper, and the

finished interior surface being of some fire-resisting board, such as linabestos, gypsum fibre board, etc. The exteriors of the buildings were finished in stucco, applied to some such material as stucco board, lath board, metal lath, etc. The roofs of the hospital units were along the simplest lines possible.

The buildings, while having their general constructional members composed of inflammable materials, may be considered as being of the "slow burning" class. The interior walls and ceilings were composed, as has been noted, of fireproof materials which would materially resist the spread of a fire making a start within the building. The exteriors of the buildings, due to the stucco finish, were also fire resisting, the only wood visible being that of the window frames and cornice trims.

ONE OF THE STANDARD WARD UNITS IN CONNECTION WITH RENA MCLEAN MEMORIAL HOSPITAL.

While it was possible, by the adoption of the semi-permanent type of structure, to keep costs to less than half that of modern hospital construction, in so far as the actual buildings were concerned, the same degree of economy could not be consistently followed with reference to heating systems. These had to be of such efficiency as would meet the extremes in climate encountered during the Canadian winters. It was, therefore, necessary to go through practically the same course in installing heating and power plants as would have been encountered in work of a permanent nature. In war hospitals constructed in countries of more temperate climates, stoves were largely used for heating purposes. It was contended by some, that a similar procedure could be followed in Canada, provided the buildings were properly constructed. Such practice was proven to be most impracticable, and it was definitely shown that taking into consideration the fire hazard, the discomfort to patients, and the coal consumption from operating so many units, the use of stoves would prove to be so uneconomical and dangerous in operation, that the installation of complete heating systems was easily justified.

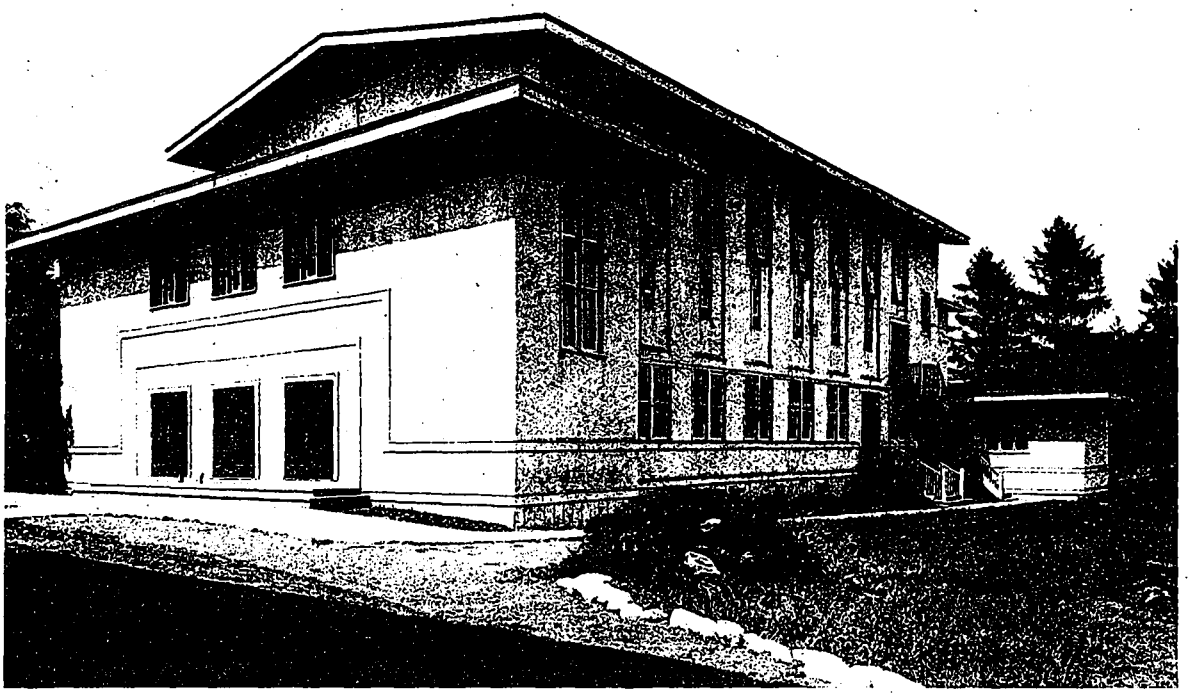
The provision of sanitation, ablution facilities, and all those requirements peculiar and necessary in the operation of hospitals, falls, to a large extent, within the same class as that pertaining to the heating system discussed in the previous paragraph. While great economy could be followed in the structural type of the building used, plumbing and ablution facilities had to be adequate and properly designed to meet all conditions. It was necessary that all institutions erected be supplied with the most up-to-date hospital fixtures obtainable, in order that those operating the institution might be properly aided in giving effect to their professional skill. One step towards economy in this direction was possible, and resulted in enormous savings to the Department. In civilian hospitals usually erected, vitreous china fixtures of expensive patterns have been used. The price of these fixtures during the period of the war, doubled and trebled, and were, at the same time, almost impossible to obtain. By close co-operation with manufacturers of sanitary equipment, iron fixtures were designed, on which was used an acid-proof enamel. This enamel would not deteriorate from the use of strong acids gener-

ally in use in institutions of this kind. The costs of these fixtures were only a fraction of that of the usual type. Their present excellent condition is proof that their anticipated qualities have been realized.

FOOD SERVICE DEPARTMENTS.

The problem of food service in any institution is one which probably gives rise to more criticism by the patients than almost any other feature. In the war hospitals built in Canada, kitchen and dining-room lay-outs were considered and planned with the utmost regard to detail. Efficient and economic food service is largely dependent upon the dietary branch, having at its command complete and up-to-date facilities for food preparation. It has been demonstrated that the complete kitchen units provided have wherever possible, and it has met with unqualified success. The system was entirely satisfactory to the patients, and the saving effected by the reduction in the number of serving staff lowered the patient cost of food to a surprisingly large extent.

For those whose disabilities confined them to their bed, each ward was equipped with a complete diet kitchen. The main kitchen supplied food for the whole institution, and proper amounts were distributed to each diet kitchen by means of heated food trucks. The diet kitchens were properly equipped for the preparation of all special diets, and by the use of steam heated appliances, such as steam tables, etc., meals could be served at any specified time throughout the day.



EXTERIOR VIEW OF RECREATION BUILDING AT COBOURG HOSPITAL.

given a service second to none in the country. The installation of up-to-date equipment such as jacketted kettles, electrically driven apparatus, Hobart mixers, potato parers, dish washers, equipment for the making of ice creams, specially designed pastry ovens, batteries of toasters, and so forth, made it possible for those in charge to render such prompt and satisfactory service that, generally speaking, criticisms from the patients have been very noticeable by their almost entire absence.

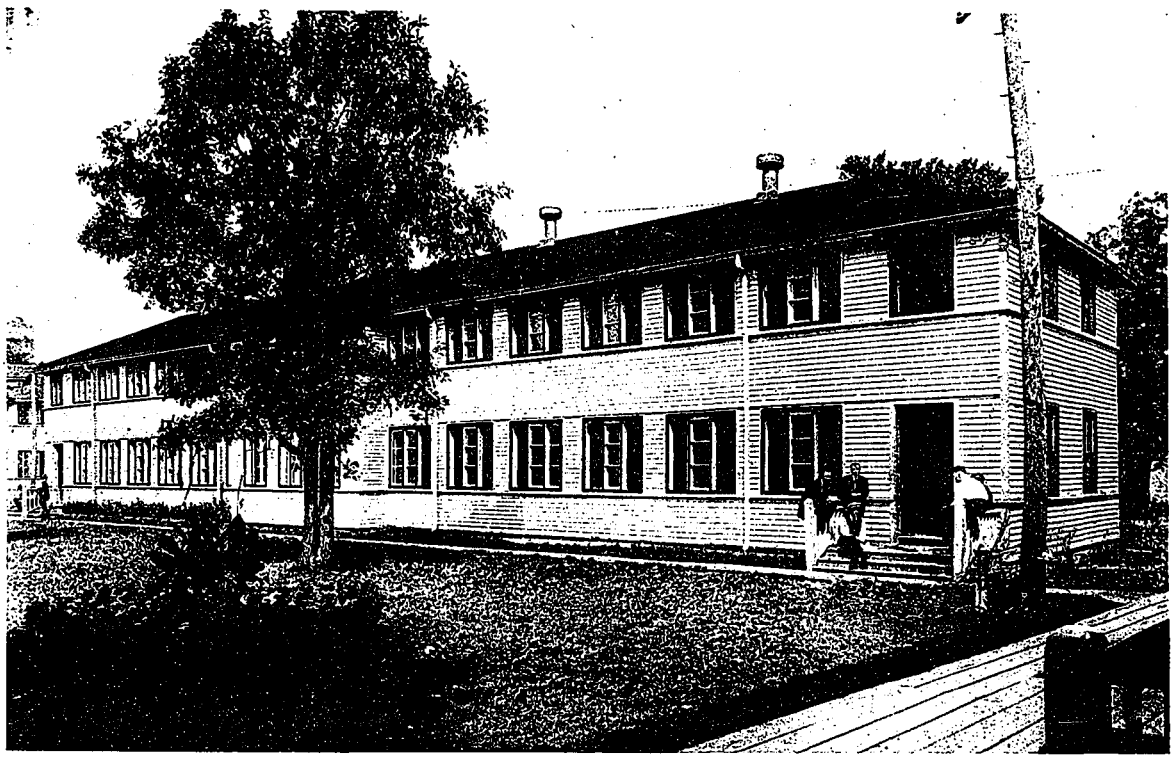
One of the somewhat unique features connected with food service in Canadian war hospitals was the early adoption of up-to-date cafeteria systems, utilized by those patients in the institution who were well enough to serve themselves. The cafeteria system was installed

Economic food service is largely dependent upon the purchasing of food supplies in large quantities. This policy was made possible by the installation of mechanical refrigeration operating large refrigerators in specially designed store-rooms.

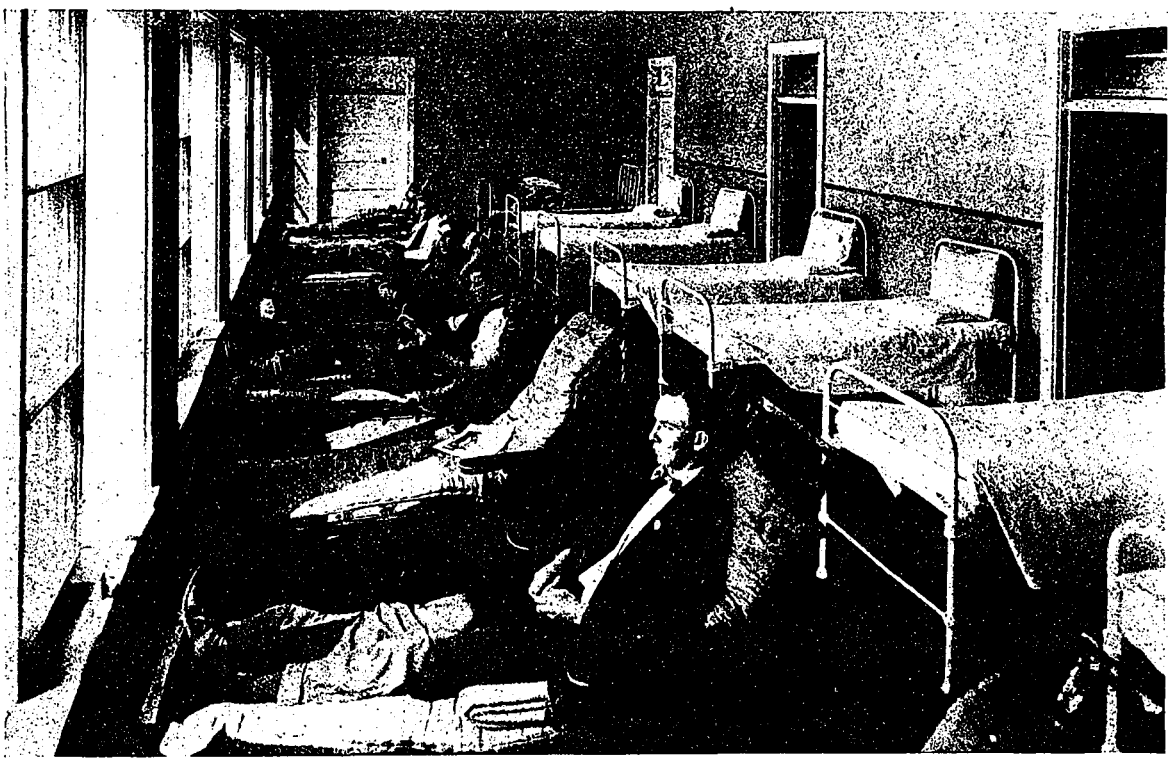
HOSPITAL APPLIANCES AND EQUIPMENT.

Reference, in the foregoing part of this book, has been made to the wonderful work of the physician and surgeon during the war. Any professional skill can only obtain its greatest efficiency when properly aided by the most up-to-date appliances and general conditions. Operating suites instituted in Canada's war hospitals were complete to the last detail. The major operating suite in an active treatment

institution was designed to embody all necessary departments in proper relation to the operating theatre itself. Sterilizing equipment of proven efficiency was installed in every such unit. In short, every piece of equipment necessary to aid skilful work was incorporated in each lay-out. The same careful degree of thought was used in the planning and allocation of space for X-ray departments. Many features not usually encountered in this work were embodied in the plans, and the results obtained have proven their efficiency. Perhaps one of the features which may receive more special attention was the complete facilities afforded in certain of the institutions for the carrying on of hydro-therapy, electro-therapy and mechano-therapy. It is doubtful if more efficient and complete departments of this nature exist in any of the



A 32-BED PAVILION AT THE MOWAT SANATORIUM, KINGSTON.



INTERIOR VIEW OF ONE OF THE 32-BED PAVILIONS, MOWAT SANATORIUM, KINGSTON.

VIEW OF ONE OF THE PAVILIONS ERECTED AT MOUNTAIN SANATORIUM, HAMILTON.

civilian hospitals on this continent. Hydrotherapy installations consisted generally of continuous baths, arm and leg baths, Scotch douche with control table, steam cabinets, and so forth. The electro-therapy branch of the work was equipped with every appliance proven to be of value in the treatment of certain disabilities. Considerable space and equipment was allocated for the use of the massage department, in order that the efficiently trained staff specializing in work of this nature might give full effect to their professional skill.

For the carrying on of special work, such as examinations in eye, ear, nose and throat disabilities, each institution requiring such facilities was equipped with complete clinics in each branch of the work. In many of the institutions, a great deal of out-patient work was carried on. Complete dispensaries for the filling of prescriptions were installed wherever required.

The foregoing remarks bear generally on the facilities which provided the necessary conditions for the furtherance of professional skill. The monotonous routine of institutional life must of necessity be broken by periods of recreation if the patient is to remain happy.

RECREATION AND VOCATIONAL BUILDINGS.

In the larger institutions constructed, recreation halls, equipped with apparatus of all kinds for mental and physical amusement, were erected. These buildings were usually of the two-storey type, the top floor being utilized for the showing of moving pictures and for use as an open gymnasium for the benefit of those whose physical condition would permit them to indulge in such pastimes. The basement, or ground floor, of the recreation hall was usually

VIEW OF 100-BED INFIRMARY, ERECTED IN CONNECTION WITH TRANQUILLE SANATORIUM, TRANQUILLE, B.C.

equipped with billiard tables, bowling alleys, canteens, barber shops, libraries, reading rooms, and so forth. The theatre portion of the building was so arranged, with stage and curtain, that amateur or professional theatricals could be properly staged at any time. These excellent recreation facilities had a wonderful effect on maintaining that proper degree of happiness among the patients which is so necessary to the well-being of one who is undergoing treatment.

The progressive policy of the Government in re-training disabled men for new occupations has already been discussed in detail in a previous chapter. The activities of the Vocational Branch of the Department could not be made

TYPICAL KITCHEN OPERATED IN CONNECTION WITH CANADA'S WAR HOSPITALS.

effective until such time as buildings were available in which to carry on academic courses and industrial re-training. In practically every city in Canada of any size, re-training classes were established on a large scale, and the work of providing accommodation for this work entailed considerable constructional activities.

In some places, vacant factories were procured and their whole interior remodelled to suit the conditions required. In other instances where existing buildings were not available, new structures had to be designed and erected, and considerable care and forethought was expended in making these suitable in every regard for the re-training of disabled men. This work did not, of course, call for so much original thought as that required in the design of hospitals, but speedy execution of the construction of new buildings and the alteration of those acquired was necessary in order that the work might go forward as rapidly as possible.

The pulse of an institution is centred in its power-house. As already mentioned herein, a central plant was employed in supplying heat, light and power to institutions which were erected. The central power-house was not only used for the supplying of heat, but very often where local rates made the procuring of electricity prohibitive, steam generating sets were installed and the institutions supplied with power and light. Included in the power-house lay-out was usually incorporated complete machinery for refrigeration which operated all cold storage rooms throughout the institution. In large institutions, where justified, complete laundry units were erected to take care of the hospitals' requirements.

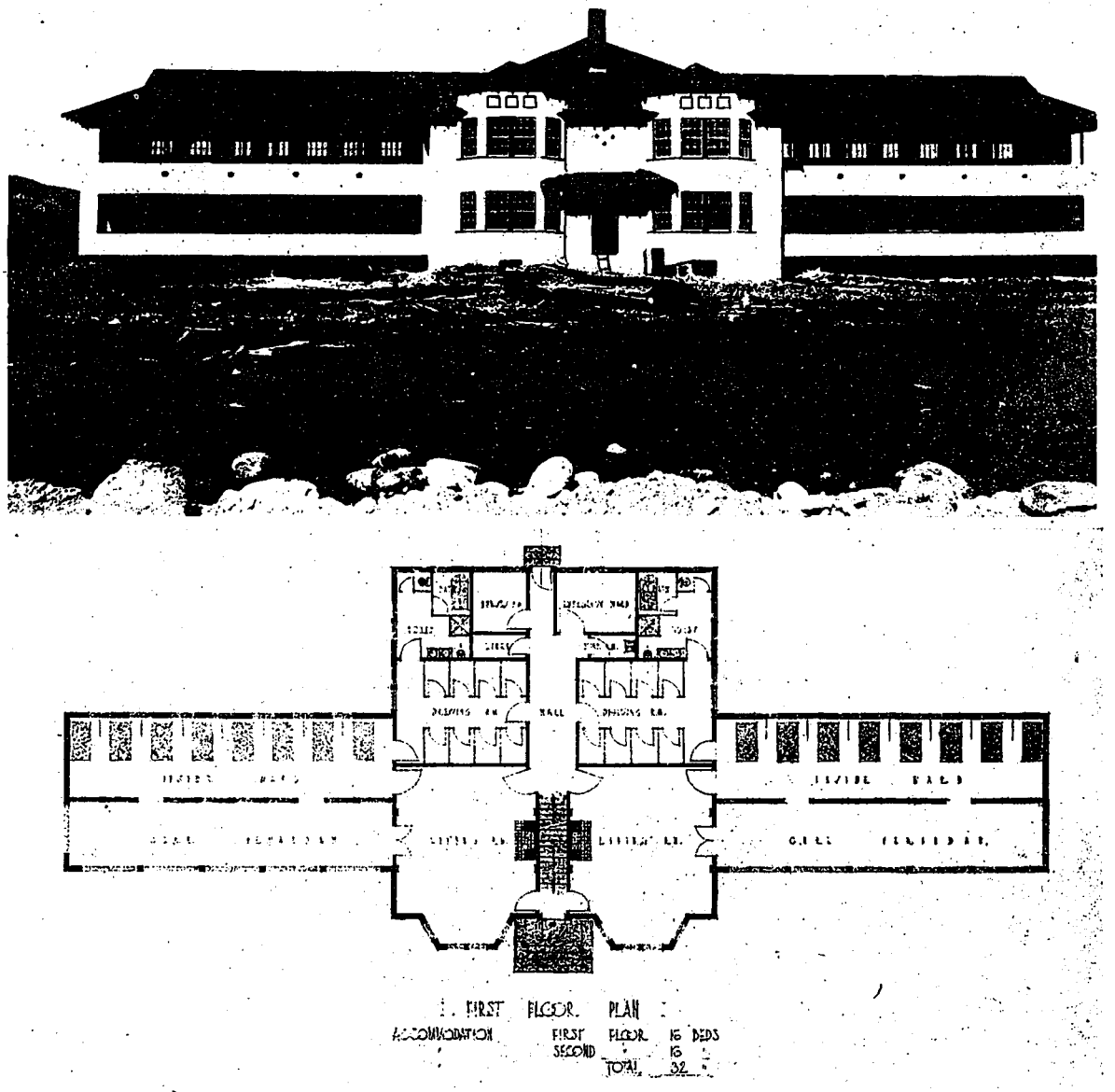
The work of the hospital programme laid out may be roughly divided into two groups: first, the provision of general hospital facilities which includes accommodation for convalescent and active treatment cases; the second natural division is that relating to the provision of hospitals for the treatment of those ex-members of the forces suffering from tuberculosis.

PROVISIONS FOR CONVALESCENT, ACTIVE TREATMENT AND TUBERCULAR CASES.

In the general hospital group, and distributed in proper relation amongst accommodation for

convalescents and active treatment cases, comes the provision of accommodation for incurables, mental defectives, neurological types, and those cases requiring special treatment under special conditions.

[Editor's Note.—The original manuscript, not given here, continues giving full description of the activities of the Government in providing hospital accommodation for convalescents, active treatments, incurables, mental defectives, neurological types, etc., etc. With very few exceptions, all hospitals included under these headings were planned and designed by the Military Hospitals Commission and its successor, the Department of Soldiers' Civil Re-Establishment, and by the end of March, 1918, some 12,000 beds were actually occupied and about 6,000 practically ready for occupancy. Due to change of Government policy, the Department of Militia and Defence took over the majority of these institutions, and the work on uncompleted institutions was carried on by the Public Works Department, who also made additions thereto and constructed some new centres as required. Descriptive matter bearing upon the general layout of these hospitals appears in another article in this book, and the original matter of this manuscript has therefore been omitted. The original manuscript, after dealing with the group of institutions giving accommodation for the cases above noted, continues in an exhaustive way to deal with the provision of sanatoria for those ex-members of the forces returning from overseas suffering from tuberculosis. Space here does not, however, permit of a reprint of all the text matter or illustrations in this connection, but the following will give a general idea of the policy which was adopted by the Department in providing sanatoria, and a portion of the manuscript given deals with a special type of pavilion for use in Western Canada. The description of this pavilion will give a general idea of the exhaustive manner in which planning was gone into.]



ONE OF THE DEPARTMENT'S NEW TYPE OF PAVILIONS DESIGNED TO MEET EXTREME CONDITIONS IN WESTERN CANADA.

The policy adopted by the Department in providing sanatorium accommodation for those suffering from tuberculosis, will prove of lasting benefit to the Dominion. Canada had, in pre-war days, a string of sanatoria from coast to coast which were variously operated by Pro-

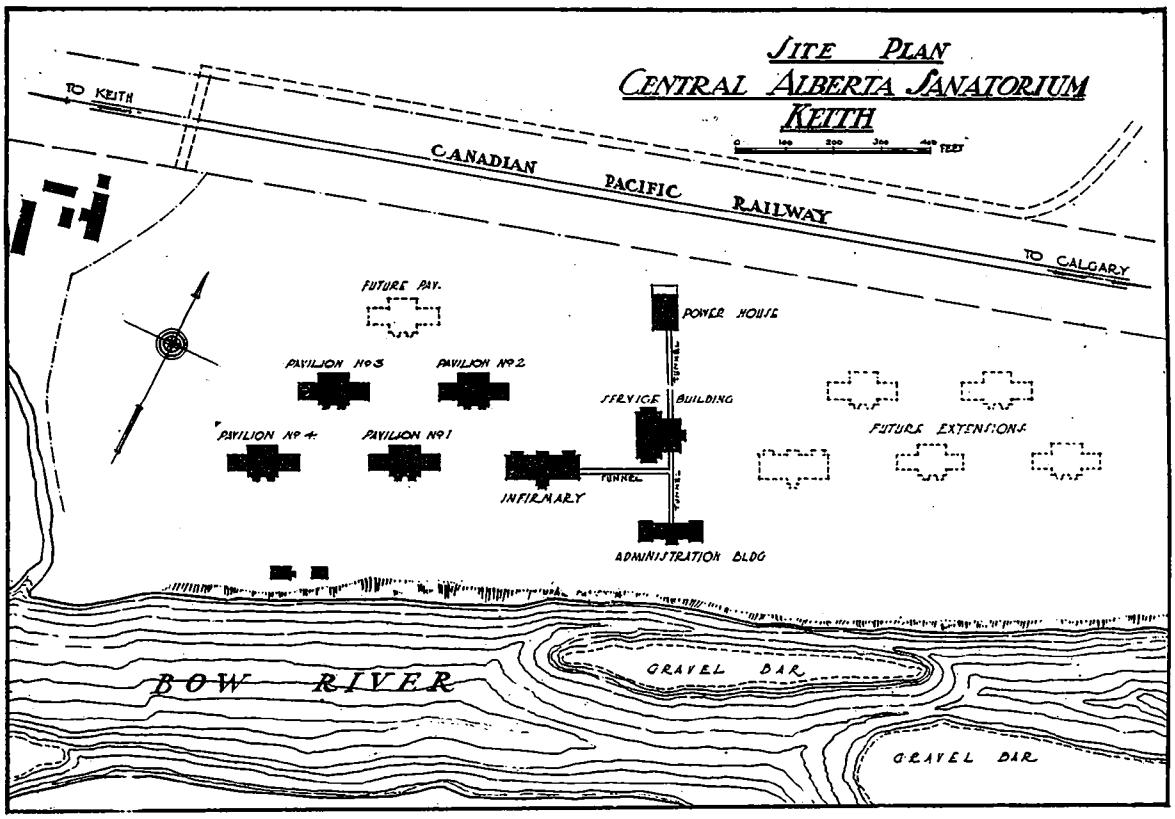
vincial Governments or independent associations.

With the arrival of patients from overseas, it was very apparent that Canada's hospital programme with reference to accommodation for those suffering from tuberculosis, would have to be a very extensive and complete one, if the cases were to be properly cared for. Civilian sanatoria accommodation was full to overflowing, and it was impossible, therefore, to obtain admittance for the Department's patients to these institutions. At the same time, it seemed to be ill-advised for the Department to launch into a programme of erecting sanatoria throughout the length and breadth of the country, without looking toward the final use to which these institutions might be put.

The Department finally succeeded in obtaining the co-operation of those in charge of various sanatoria already established, in making extensions to existing facilities. The co-operation thus afforded was usually in the manner of a substantial contribution toward the cost of such extensions, the buildings so erected to finally revert to the control of civilian institution. By this procedure, great economy in the provision of tuberculosis accommodation throughout Canada was possible. In many cases, it was found possible to add considerable bed accommodation to institutions without materially increasing the general services. Such opportunities meant that the Department had the advantage of a large investment without the attendant first costs.

Always having in mind the more or less permanent nature of the sanatoria accommodation to be provided, it is possible that even more research work was done in the matter of planning these institutions that that followed in the general hospital work.

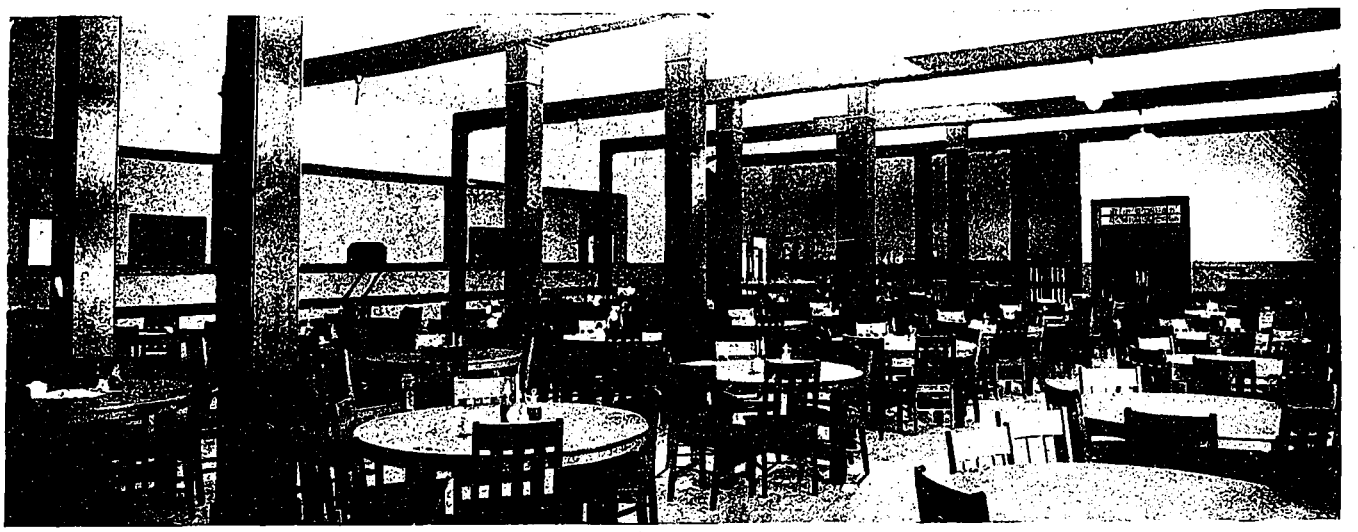
The design of accommodation for infirmary and incipient cases as finally followed by the Department, has practically revolutionized sanatoria lay-outs in Canada. From a comparison of the Canadian plans with those of other countries, it is doubtful if any of these later



BLOCK PLAN OF CENTRAL ALBERTA SANATORIUM, DESIGNED BY THE DEPARTMENT AND ERECTED JOINTLY BY THE PROVINCIAL AND FEDERAL GOVERNMENTS.

institutions show the same thought and care as evidenced in the designs of those prepared by the Department. Sanatoria superintendents and professional men expert in the treatment of tuberculosis, were constantly in consultation, and an endeavor was made to arrive at and incorporate the best ideas available. Some of the prominent institutions in the country to the south were visited with a view to ascertaining the best practices followed in that country.

A new type of pavilion peculiarly adapted to the rigorous climate of Western Canada has been adopted, and specialists claim that it is one of the best that has yet been attempted. Provision of adequate infirmary accommodation has also been made, and this building incorporates the newest features considered desirable



PATIENTS DINING ROOM, NOVA SCOTIA SANATORIUM, KENTVILLE, N.S.

for the furtherance of the treatment of cases in the advanced stages of tuberculosis.

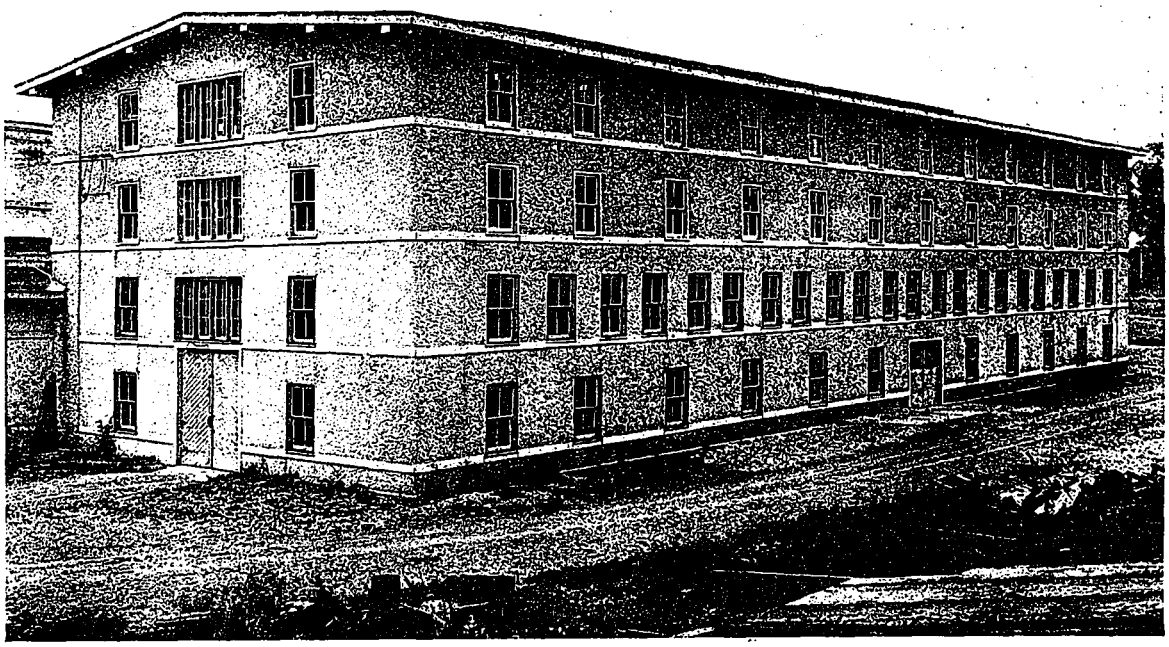
A NEW TYPE OF PAVILION.

The general services of the institution were so designed that the institution could finally take care of 500 patients. Having in view the ultimate use to which this institution would be put, namely, the care of the general public of the Province of Alberta, the lay-out of the institution was arranged to properly provide male and female accommodation. The buildings are divided into two groups—each group consisting of a number of pavilions for incipient cases, and an infirmary building providing the proper proportion of beds to take care of the advanced cases in each centre. Both groups are under the direct control of one administration building which, in turn, is in direct communication by underground tunnels with the service buildings, the infirmaries, and the power-house.

The administration building lay-out embodies all features necessary in the business management and control of a centre of this kind, and in it are installed complete operating suites, clinics, treatment rooms, X-ray departments, and so forth, for the whole institution. This method of centralization is somewhat of a de-

CAFETERIA COUNTER, NOVA SCOTIA SANATORIUM, KENTVILLE, N.S.

parture from the usual custom which has generally been followed in civilian institutions, it being usual to place such facilities in the infirmary. This, however, in a lay-out such as that planned for Central Alberta Sanatorium, would prove uneconomical, inasmuch as the existence of two infirmaries would necessitate the duplication of equipment and general control. The service building, which will ultimately contain two large dining-rooms, is designed to give to those patients who are well enough to walk to their meals, food by the cafeteria system. The central kitchen in this building will prepare all food for the entire institution, and food will be delivered to the infirmaries in heated food wagons through underground tunnels. The power-house to the rear is also connected with the main group of service buildings by a tunnel, and embodies all those features necessary in a complete power-house unit. Arrangements are pending with the Canadian Pacific Railway, whose main line is in the vicinity of the institution, to run a spur to the power-house, so that coal may be delivered with the least handling possible.



CENTRAL STORES BUILDING AT THE SPEEDWELL HOSPITAL, GUELPH, ONT., IN WHICH HOSPITAL EQUIPMENT AND SUPPLIES ARE CARRIED FOR USE IN ALL OF THE DEPARTMENT'S INSTITUTIONS.

WAR HOSPITALS AND CIVILIAN NEEDS.

[Editor's Note.—The following extract from the original manuscript deals with the possibilities of following in part Canada's War Hospital Programme in providing sufficient accommodation for civilian needs.]

The carrying out of the Department's policy in reference to hospital accommodation, is perhaps one of the most extensive schemes of its kind that has ever been carried to a successful conclusion under one central organization in Canada. Its success was largely due to the farsightedness and capabilities of the late Deputy Minister of the Department, Mr. Samuel A. Armstrong. Mr. Armstrong, previous to his connection with war work for the Federal Government, was Assistant Provincial Secretary of of the Provincial Government of Ontario, and during his period of office with the Province, promoted many large schemes for the hospitalization of the populace of Ontario. The Chief Architect of the Provincial Secretary's Department of Ontario, Mr. Jas. Govan, was also largely instrumental in a consulting capacity, in reference to the formulating of original schemes for Canada's war hospitals. While Mr. Govan was never actively engaged by the Department, his advice was often sought. The general merits of the work can be generally attributed to the faithful and untiring efforts of those men who were actively engaged in the work. Special mention may here be made of the untiring attention and close application paid by Mr. W. L. Symons to the work during the period that he was on the staff of the Department.

Canada's type of war hospital, as already stated herein, was evolved after most careful consideration had been given to the problem. The scheme adopted was largely on account of the necessity of keeping constructional expenditures to the absolute minimum. During the operation of the institutions, other facts have become apparent, and it has been found that their operation and general upkeep has been

maintained with just as much ease, and possibly with more economy than hospitals erected for civilian purposes during pre-war days.

When it is considered that the patient day costs in Canada's war hospitals does not surpass, and is probably less than similar costs in other institutions, and when this consideration is coupled with the fact that the capital expenditure involved approximates less than 50 per cent. of what ordinary institutions cost in pre-war days, one immediately realizes that here is an object lesson, a careful study of which may lead to solving the difficult problem of providing Canada with sufficient institutions to properly meet the needs of its population.

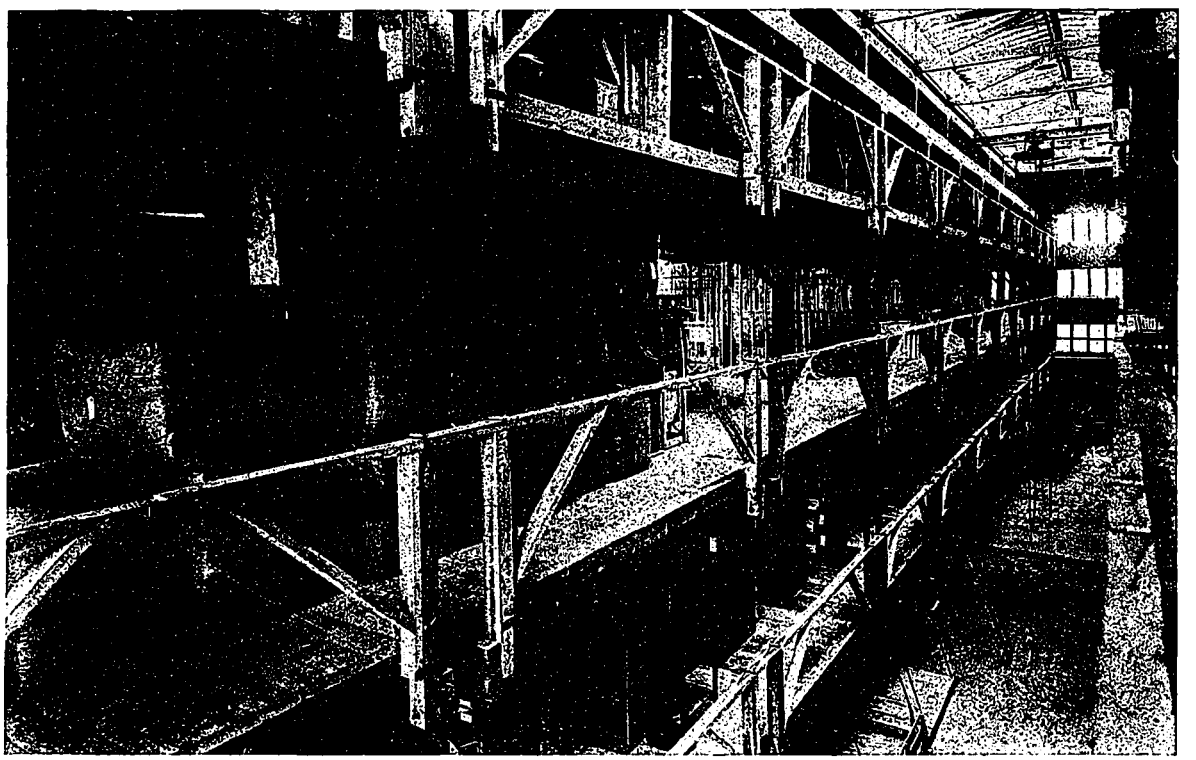
There is a great lack of civilian hospital accommodation in Canada at the present time, and if proper and adequate facilities are to be provided, some very progressive programme will have to be instituted.

Those who are responsible for the public welfare, while realizing the necessity of accommodation, are loath to promote constructional projects that would properly meet the situation, on account of the enormous increase in construction and material costs. Even before the war, the erection of hospitals and institutions involved expenditures that invariably raised the tax rate apparently out of all proportion to the facilities afforded. Only our larger cities seem to have been able to finance the erection of institutions that would afford the most up-to-date facilities.

One step toward solving the cost of institutional work is seen in the Community Hospital Movement. This proposal puts forth the idea of establishing central institutions which will serve a number of neighboring municipalities. It is believed that this step is one in the right direction, and if the proper degree of inter-municipal co-operation is maintained, there is no reason why such projects cannot be carried to a successful finality. To-day, with our advanced facilities for transportation, the good roads movement, and the almost universal use of motor transport, the community hospital, serving a number of municipalities, is an idea which, if carefully worked out, should give the desired results.

There is another phase of institutional work which, in these days of "monolithic" structures, seems to have been passed unnoticed by those who are most affected. Civilian hospitals erected in pre-war days have generally been of the "monolithic" or multiple storey type. Canada's war hospitals which represent an accommodation for nearly 20,000 men, have been commented upon most favorably by those in a position to criticize, as obtaining all those features of utility that go to make up an efficient working hospital. Due to the rapid advance that is continually being made in the science of medicine and surgery, the useful life of an institution is a comparatively short one. We have evidence of this at every hand, inasmuch as hospitals constructed comparatively a few years ago are now out of date, and professional men are urging the provision of more up-to-date facilities. The unit type of hospital, as followed

(*Concluded on page* 101.)



INTERIOR VIEW OF CENTRAL STORES BUILDING AT GUELPH, SHOWING THE TIER ARRANGEMENT OF FLOORS, ADOPTED TO FACILITATE EFFICIENT HANDLING OF STOCK.

CONSTRUCTION

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Canadian Materials and Foreign Products

Such views as have been expressed following the letter recently sent out by the executive of the Ontario Association in reference to the employment of outside architects for the use of foreign products in the erection of Canadian buildings, are quite in accord with the sentiments that everything possible should be done to encourage Canadian resources. The statement is made that the profession has always supported any policy which aimed to promote Canadian interests, and that all things being equal, preference has always been given to Canadian materials. It is contended, however, that it is at times difficult to use Canadian goods exclusively, due to the fact that certain necessary materials are not produced in Canada, and because in certain competitive lines, foreign products are considered of better quality.

In this connection attention is drawn to the fact that there is no Canadian-made roofing on the market, although there is an abundance of raw material. The result is that the only satisfactory fireproof roofing material of this character is the slate quarried in England and the United States, or the tile manufactured in those countries. It is also asserted that a considerable portion of Canadian-made goods are manufactured by firms in the United States and sold under Canadian names. Besides this it is said that the craftsmanship of some Canadian lines is not of a sufficient high standard. The contention is that it would be unwise on the part of the profession to foster a spirit that would accept any material on the basis that it is "good enough" simply because it is of Canadian manufacture.

All this is true to the extent which at times makes it necessary for architects to specify goods other than of local manufacture. It is likewise necessary to import architectural terra cotta and certain marbles. On the other hand it is generally recognized that Canada is in a position which should enable her to fully meet her own requirements as regards most basic materials. There are a number of industries producing brick, hollow tile and cement of a quality which should make it unnecessary for anyone to go outside of the country in order to meet their needs. Also manufacturers of electrical goods, hardwood flooring, paints and varnishes, builders hardware, etc., which produce high-grade materials. A very excellent granite is quarried in Quebec, as well as the marble which has been successfully used in a number of important buildings. The position of the country in this respect can be extended to cover many other lines, such as plumbing goods, heating apparatus, steel sash, as well as building stone produced in various parts of the Dominion.

A recapitulation in fact shows a wide field of resources susceptible to still greater industrial possibilities. To encourage the development of these resources is the duty of everyone concerned with building construction. At the same time no manufacturer has a right to assume that simply because his goods are produced in Canada that they are entitled to special consideration on that account alone. Architects must of necessity protect their own reputation and the investment of their clients, and in giving consideration to the materials to be used, it is conforming to sound economic practice to insist that made-in-Canada goods are equivalent to the best. The obligation rests with the manufacturer to produce the right quality of goods, and with Canadian architects to specify them.

Architects Confer with Customs Board

Members of the Royal Architectural Institute of Canada recently conferred with the Customs Board at Ottawa with a view to securing the revision of the basis of appraisal on imported architectural and engineering plans to provide conservation of the opportunities arising in Canada for Canadian architects and engineers.

Ontario Housing Report

(*Continued from page* 86.)

"Sufficient educational work has been done under the Act to show that houses three rooms deep are not necessary or desirable except on unusually wide lots or, in very special circumstances, on very narrow lots. No exceptions will be made to the side clearances demanded in the "Report re Housing," printed last year, in checking plans of the three room deep type unless the middle room has a window to the rear in a break in line of side wall.

"Too much attention cannot be given to the placing of houses on lots so that they will get the full benefit of direct sunlight into as many rooms as possible, especially during the winter months, when it is almost impossible to get sun purified air into homes through open windows and doors.

"In many cases the placing of a verandah right across the front of a house has the effect of shutting sunlight out of a room throughout the entire year. This should be emphatically condemned in our climate where the ordinary verandah can only be used for a very few months of the year at most.

"Low cost housing can only be obtained by eliminating every foot of waste space. This has the inevitable effect of restricting the size of the kitchen. As this is the workroom much greater attention should be given by planners to the traffic lines through the kitchen and the relation between door openings and furniture spaces.

"It has been only too evident during the past year that these features have not been given a sufficient amount of consideration. A small kitchen is only satisfactory when traffic lines will leave enough wall and floor space to accommodate the furniture which is essential for the work to be performed.

"When this point has been studied it will be found that it is rarely desirable to provide a separate door opening right out to the rear of the lot, in addition to the grade entrance to the cellar, which should also communicate with the kitchen."

Other recommendations of Mr. Govan refers to further desirable economies of plan and construction, such as simplicity of roof construction so as to eliminate the cost of hips, valleys, flashings, etc., the placing of upper floor partitions over those on the floor below, the arrangement of plumbing fixtures for bathroom, kitchen and laundry so as to make only one soil-stack necessary, as well as the questions of ventilation and insulation.

CONSIDERATIONS AS REGARDS THE QUESTION OF SITES.

Information of special value to Housing Commissions in the preliminary stages of their developments is contained in the report of Messrs. Harries and Hall, town planners, which forms an important part of the general summary. This part of the report points out that the needs of no two municipalities are exactly alike. Land values and construction cost vary widely with the number of vacant sub-divided lots within a municipality, and the degree to which they are already served by municipal improvements. The location of industries within a municipality is necessarily a governing factor in advising the Housing Commission whether (a) to accept only applications of individuals; (b) to accept only applications of housing companies; (c) to purchase only land en bloc for subdivision and turn the lots over to applicants at cost; or (d) whether to adopt two or all of the above policies.

The report deals quite extensively with the subjects of block plans for housing projects in subdivisions as well as regards individual lots, and the necessity on the part of local commissions to take levels and prepare a topographic plan showing all existing trees, building and rock outcrops as well as all adjoining streets and streets intersecting the boundary streets.

"Many things tending towards economy can be easily arranged for, if the location and floor grades of the houses are studied generally, in relation to each other, together with the requirements of grades necessary for economical development. The block plan makes it possible to select housing locations reasonably close together, so that the contract for a number of houses of the same type may be awarded and constructed, and a second contract may later be awarded for houses of a different type, which can be placed between those first erected. In this way, the danger of too close duplication of houses of the same type prevalent in quantity production can be overcome."

The report also deals with the question of light and air, and as to how the matter of light can often be improved by inverting the plan of a house. Also with the placing of houses on adjoining lots which can be so arranged that service walks for both houses may be adjoining, with a later possibility of the walks being used for runways for future garages. Where applications for houses on adjoining lots are submitted at different times, the report advises against too frequent duplication of the same front elevation along the street.

Additional matter takes up the width of streets, property lines, main and secondary streets and their development as regards traffic requirements. Referring to open spaces such as parks, playgrounds and other recreational areas, it is pointed out that these can be provided at less cost to the individual, if considered in the subdivision of the project. To do otherwise means that if these features are desired the applicant will be required to pay for

them through the tax rate at a future time, with the chance that they will not be as desirably located.

LOCAL IMPROVEMENTS.

Another part of the report prepared by R. O. Wynne Roberts, Consulting Sanitary Engineer, deals with the question and local improvements, which gives, in part, the following advice to local commissions:

"It is highly advisable that the Local Housing Commissions should insist upon a pure and sufficient supply of water for domestic and fire purposes. They should also urge that the new houses should have internal sanitary accommodations, sewer connections and dry foundations. In some instances water is available only by sinking wells, and sewage is disposable by building septic tanks and distributing tiles. When a number of houses are built on adjoining lots it is difficult to see how the purity of the water or the sanitary condition of the lots, especially in dense soil, can be properly safeguarded. Moreover, one of the proposed Provincial Board of Health regulations is that no tile sewage disposal system shall be within 150 feet of the source of any water supply, whether it be on the same or adjoining property. Wells and septic tanks should be at opposite ends of the lots. If this is not possible or the conditions are not favorable, then it is desirable that an earth closet or other satisfactory sanitary accommodation should be located as far distant from the well as possible. The point which I desire to make is that new houses should, as far as possible, be located where municipal watermains and sewers are available, or are likely to be laid in the immediate future, and thereby enable the home builders to avoid the risks due to polluted wells and unsatisfactory private sewage disposal works.

"It is advantageous for efficient municipal administration to have compactly built up cities, towns and villages. If any city, town, or village spreads out unduly, the mileage of watermains, sewers, sidewalks and other municipal works must sooner or later be increased without adding much to the revenue, or the sanitary conditions may not be satisfactory. Furthermore, when sewers and watermains are extended, the houses have to be connected thereto and the wells and septic tanks have to be abandoned, and thus the cost of the housing scheme is increased."

Canada's War Hospital Development

(*Continued from page* 98.)

by Canada for war purposes, would appear to more nearly meet the situation than any other possible scheme. The buildings are of cheap construction, but at the same time their interior arrangement and finish provides every facility required. Extensive constructional methods and elaborate use of bricks and mortar do not aid in the recovery of the patient. It would seem, therefore, that the logical conclusion arrived at in the solving of Canada's future hospital policy, is that designers should confine themselves to the least possible capital expenditure, so as to permit of procurable funds being readily available for the proper maintenance and professional care of the patient. Reduction in capital expenditure means reduction in hospital rates. Reduction of capital expenditure will make funds available for improved services. It will surely be conceded that money expended in providing increased numbers of medical staff and nurses, accrues directly to the benefit of the patient, whereas such money sunk into elaborate building methods, is lost entirely, in so far as the well-being of the patient is concerned.

It is not to be concluded from these remarks that the erection of inflammable structures is recommended. Institutions composed of unit buildings of one storey height, or at the most two, will permit of the lightest possible type of fireproof construction. The exact type of construction to be used is a matter dependent upon too many considerations for full analysis here. Economy lies in the policy of using unit buildings to obtain the required accommodation instead of multiple storey construction.

Who can foretell what the ideal type of hospital will be in the course of the next few years? Conditions that were considered ideal a comparatively short time ago, have now been discarded. It seems probable that a similar advance will be made in the future years. To keep pace with this advance, if hospitals constructed to-day are designed and erected with proper forethought, regard to capital expenditure, and the probable length of their useful life, they may, when ideas have changed, be altered, extended, or even demolished, in order to meet the ever-changing requirements. Such facility of alteration, change or renewal could not possibly occur in a monolithic structure of reinforced concrete of the multiple storey type. Such a building, after its usefulness has come to an end, must be thrown into the discard, in so far as its use for a hospital goes.

The possibilities discussed in the preceding paragraphs are being entertained by experts, both on this continent and in Europe. The tendency of thought of many is toward the semi-permanent type of construction for future institutional requirements. It would appear that Canada's experience gained in its hospitalization programme confirms, to a large extent, the soundness of these views.

New Method of Heating Buildings

A new scheme for heating buildings, described as the application of the "aerofoil" theory, was advanced recently by Professor G. H. Bryan, speaking before the British Association at Bournemouth. He said that while working at the mathematical theory in connection with aeroplanes the idea of the aerofoil theory occurred to him, and the results obtained had agreed with the theory far better than had been anticipated.

His proposal, he said, was to place over every radiator in a public or private building a deflector, arranged at an angle determined by experiment. Without the deflector the hot air from the radiator was drawn up towards the window and so passed away from the interior of the room. But with the deflector in use the hot air was passed from its underside into the room in a free stream, while the mass of cold air between the outer side of the deflector and the window formed a non-conductor and prevented the hot-air from escaping through the window to the outside.

It was essential, he said, that the deflector should have a sharp edge, so as to secure a free stream of hot air; with a rounded edge eddies of hot air were produced which did not carry so far into the room.

Cleaning White Marble

A writer in an English technical journal gives the following suggestion for cleaning a carved white marble statue: Should the dirt on the statue be due to the vegetation it may be removed by first washing over with soda water. While this is eating into the grime scraping with an old knife, accompanied by the free use of small pieces of gritstone, should be sufficient so far as the removal of the dirt is concerned. A copious use of clean water will complete the process. Another good marble-cleaning preparation is to take two parts common soda, one part powdered pumicestone, one part of finely prepared chalk, pass through a fine sieve and mix with water as needed. Rub the preparation well over the marble, then wash clean with soap and water. The marble may be polished with washed emery powder and putty powder, using a piece of linen rag in the process of spreading it on and rubbing.

New Illinois Law Permits Partnerships Between Architects and Engineers

Registration and licensing of architects in Illinois, according to the "American Architect," are provided by a new state law amending previous laws and specifically permitting licensed architects to enter into partnership with licensed structural engineers. A company engaged in architectural work may not be licensed, but must have a registered architect at its head.

This law does not affect draftsmen and superintendents acting under the supervision of registered architects, but persons registered under this law are exempt from the provisions of laws regulating the practice of structural engineering. It does not apply to residential or farm structures outside of corporate limits or to structures costing not over $7,500 within such limits.

Examinations for license will cover design and construction, sanitation and ventilation, strength of building materials, and the ability of the applicant. The law describes a "building" as follows: "A building is any structure consisting of foundations, floors, walls, columns, girders, beams and roof, or a combination of any number of these parts, with or without other parts."

Personal

H. S. Dowswell, A.R.I.B.A., and Charles Dolphin, late Captain, C.E.F., have formed a partnership for architectural practice under the firm name of Dowswell & Dolphin.

Mr. Dowswell is a graduate of the School of Architecture, McGill University, and until recently was chief draftsman for Ross & McDonald, Montreal, having previously occupied the position of assistant office manager with Carrerre & Hastings, New York City. He was also responsible for the Housing Report of the Ontario Government, and is at present carrying out the housing project for the Riordan Pulp and Paper Company at Hawkesbury, Ont.

Mr. Dolphin, with whose sketches our readers are already familiar, was also formerly with the firm of Ross & McDonald, in charge of design, and spent a year in travel and study abroad just prior to the outbreak of the war, in which he saw four years' service, having achieved distinction while in charge of the 5th Brigade Scouts, and being listed among the casualties at St. Eloi.

The new firm will maintain offices at both Toronto and Montreal.

Mr. Louis O. Secord and Mr. Herbert E. Murton have formed a partnership for the practice of architecture under the firm name of Secord & Murton, with offices in the Home Bank Building, 72 James St. N., Hamilton, Ont., and will be pleased to receive manufacturers' catalogues and samples.