THE NEW MEDICAL BUILDINGS OF THE UNIVERSITY OF TORONTO.

THE new buildings for the department of physiology and pathology of the University of Toronto, which are to be formally opened in October next, are the first to exemplify the unit system of laboratory construction proposed by Professor Minot,* of Harvard University, and consequently an account of them may be acceptable to all who are interested in laboratory administration and construction.

The main features of the unit system, as outlined by Professor Minot, are all comprehended in the character of the laboratory 'unit' room. This must, first of all, be no larger than is required to accommodate readily the maximum number of students whose practical instruction a single demonstrator can efficiently guide and control. It must also be of such dimensions that it can, at need, be made to serve as a museum, a library or reading room, or a small lecture room. The units, further, must be so placed with respect to one another, preferably in pairs or series, that, by the removal of the partitions separating them, rooms of larger dimensions may, when desired, be obtained at a minimum cost and in a short time. The dimensions of such a unit, as determined by Professor Minot, are 23 x 30 feet, and this room will accommodate twenty-four working students, which number, experience shows, is the largest that should be under the supervision of a single class demonstrator.

The system, as may be seen, offers the great advantage of elasticity, for a laboratory director may enlarge or contract, at will, or according to the needs of the occasion, the accommodation required for a class, a feature that does not obtain in any other system of laboratory construction. It has also other and not less important advantages. The cost of construction is less than in any other system, it adequately provides for the all-important question of light, and it permits of subsequent extensions and additions without disturbance of the original arrangements. It is also to be noted that the system provides for the formation of smaller rooms through the division of the unit.

All these points were thoroughly canvassed when, nearly two years ago, the medical faculty of the University of Toronto took up the question of erecting new laboratory quarters for physiology, physiological chemistry, pathology and public health, and discussed the various plans of construction offered. The result was that the faculty unanimously recommended the adoption of the unit system for the proposed laboratories. The university trustees accepted the recommendation, and construction, begun in August last year, has progressed so rapidly that the buildings are completed and the equipment is now being put in. The whole is, therefore, at the moment in such a stage as to permit one to say to what extent the object sought has been attained.

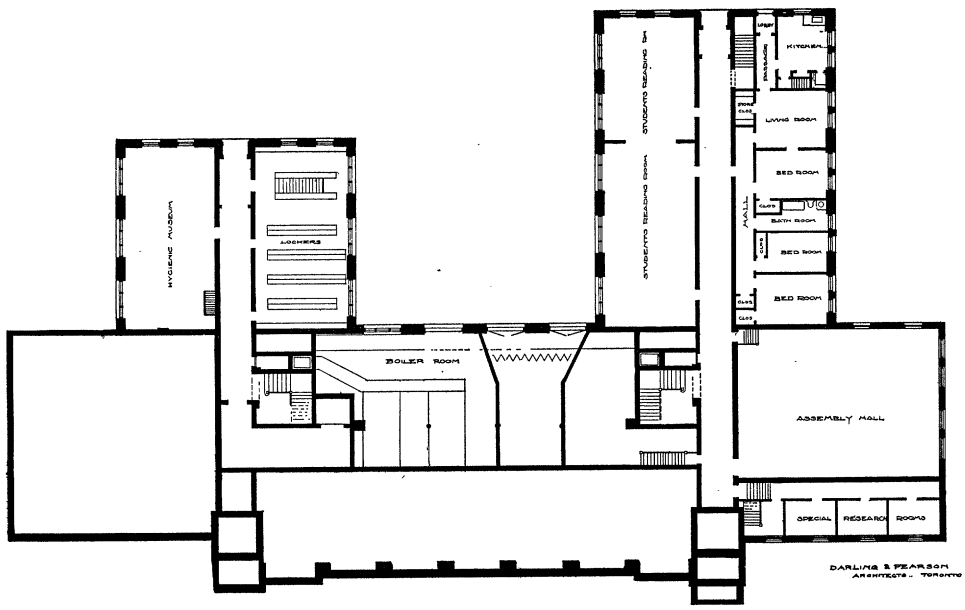
Architecturally, so far as the exterior is concerned, the utmost has been done, considering the difficulties that the enormous window space interposed. The appearance of the buildings, however, is, on the whole, very acceptable.

The interior, on the other hand, is very satisfactory. The accommodation it furnishes, as well as the conveniences of arrangement it offers, is sufficient to demonstrate the great advantages of the unit system over the common, more or less haphazard, system of laboratory construction everywhere illustrated.

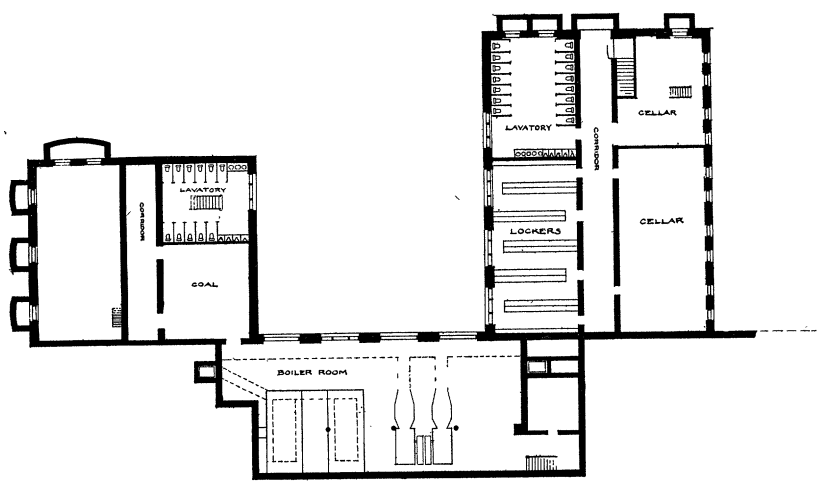
The buildings are to house physiology, physiological chemistry, pathology and

* *Philadelphia Medical Journal*, Vol. VI., p. 390, 1900; SCIENCE, Vol. XIII., p. 409, 1901.

public health. The wing to the right, as shown in the accompanying diagrams, accommodates physiology and physiological chemistry and contains, in addition to the lecture theaters, twelve units and eight half units. The other departments occupy the main portion and the left wing, which contains sixteen units and fourteen half units.



MEDICAL BUILDING TORONTO UNIVERSITY
BASEMENT PLAN.



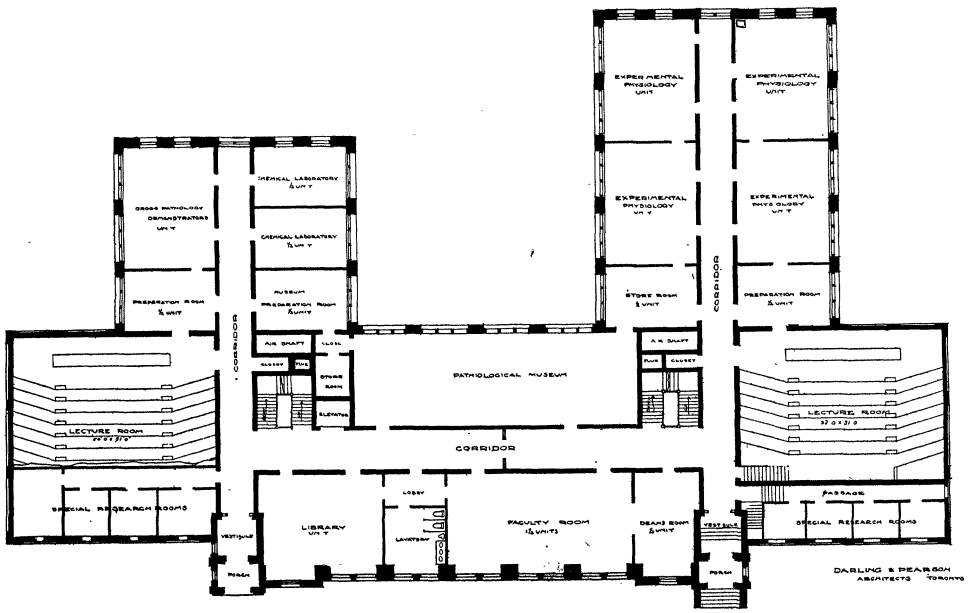
MEDICAL BUILDING TORONTO UNIVERSITY
SUB-BASEMENT

In the construction of these buildings according to the unit system special local conditions had to be considered and, further, the possibility of their extension in a few years was a factor in determining the arrangement as a whole. This necessitated important modifications in the disposition of the units as suggested in Professor Minot's later paper.

What these modifications are may be gathered from examination of the copies of the plans of the various floors of the buildings. The latter are in the form of the figure ⊔, the lecture theaters forming wing-like extensions at the angles of the figure. This latter arrangement was adopted in order to permit the lecture rooms to be lighted from their roofs, and at the same time to avoid interfering with the light for the units. An additional advantage resulted from the arrangement in that the corridors, which are centrally placed, permit ready access to the lecture theaters and units from the entrances and from the students' quarters.

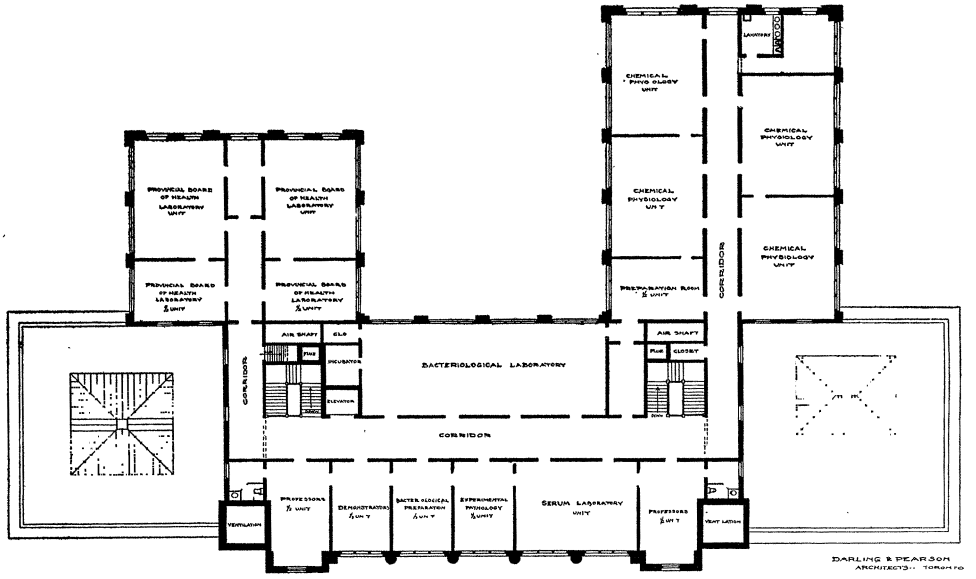
The units are, for the most part, grouped in pairs on each side of the corridors on the various floors. The walls of the corridors are of brick, but those which separate the units from each other are of wood and plaster only, and they can consequently be removed in a few hours without leaving traces of their disturbance other than those on the line of the fresh plaster added. Each unit communicates directly with its neighbor by a door, and, further, has two doors opening into the corridors. It is thus possible at any time to form two rooms out of a unit, each of which will communicate directly with the corridor.

The window space devoted to each unit is ample. It is, in fact, as large absolutely as the supporting capacity of the outer wall will safely permit. The window area is 242 square feet, while the outer wall of each unit measures 420 square feet.

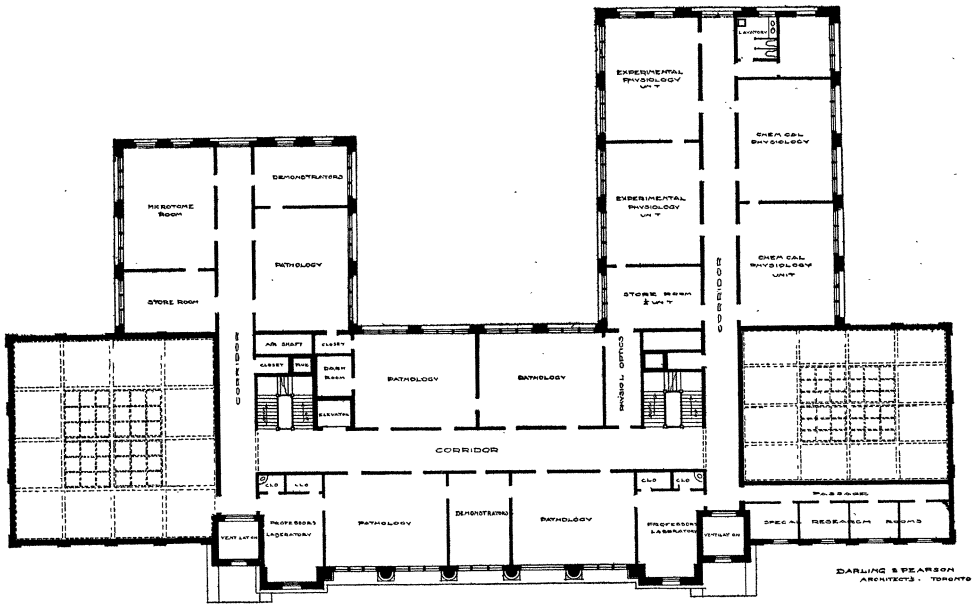


MEDICAL BUILDING TORONTO UNIVERSITY
GROUND FLOOR PLAN

The window area is, therefore, nearly three fifths that of the outer wall. The terminal units of the wings have additional window space in their second outer wall, and of course in these the lighting is brilliant. In all the other units, however, the lighting is, as already said, ample.



MEDICAL BUILDING TORONTO UNIVERSITY
SECOND FLOOR PLAN



MEDICAL BUILDING TORONTO UNIVERSITY
FIRST FLOOR PLAN

The corridors are lighted from the hall doors, from the large windows at the ends of the wings and from the wells over the

stairway. An examination of the building itself shows that this provides sufficient illumination with diffuse daylight, and even on very dull days it is enough for all except, perhaps, the main corridor extending between the two lecture theaters on the ground floor, and then resort may be had to electric lighting.

The two stairways are lighted from the roof, and are so placed as to permit the student reaching any floor directly from the basement, where the reading and writing rooms are situated. The locker rooms and lavatories, on the other hand, are in the subbasement and can only be reached from the basement corridor.

The wings are, including the basement and subbasement, five stories in height. The main portion is only three stories, if we leave out of account the boiler room. This arrangement is due to the fact that the rear part of the building is placed in a shallow ravine. White brick, with stone facings here and there, is the material; the roof is flat and bordered all round with a brick parapet.

The building is heated by air forced over heated coils by large fans driven by steam and the ventilation is thus, in part, provided for, and also by the exhaust currents in the ventilation turrets which rise over the entrances.

A feature of special interest is presented by the small research rooms. The half units are intended to be used for various purposes, but chiefly for small groups of students pursuing advanced work or for special lines of research, but each of the fifteen small rooms, shown in the plans as adjacent to the lecture theaters, is reserved for individual workers carrying on selected investigations. These, with the other arrangements described, have been designed with the view of making the buildings a home for research. A. B. MACALLUM.

SCIENTIFIC BOOKS.

A Laboratory Text-Book of Embryology. By CHARLES SEDGWICK MINOT. Philadelphia, P. Blakiston's Son & Co. 1903. Pp. 380. With 218 illustrations, chiefly original.

The past year has witnessed the publication of several manuals of embryology, among which may be mentioned: (1) The comprehensive and exhaustive 'Handbuch der vergleichenden und experimentellen Entwickelungslehre der Wirbeltiere,' edited by Dr. Oscar Hertwig, of which eleven Lieferungen have appeared to date; (2) Korschelt and Heider's 'Lehrbuch der vergleichenden Entwicklungsgeschichte der wirbellosen Thieren, allgemeiner Theil' in two parts; and (3) McMurrich's admirable 'Development of the Human Body.' The first furnishes the student with the only complete summary of the embryology of vertebrates published since Balfour's 'Comparative Embryology' appeared in 1881; in it the enormous mass of literature since that date is fully digested, and the results are presented in connected form, so that it may serve as a new starting point for the student of vertebrate embryology. In the general part of their text-book Korschelt and Heider furnish the long-promised completion of the special parts by a full treatment of the structure, origin, maturation and fertilization of the germ-cells, and the experimental embryology of invertebrates. McMurrich's book is an excellent brief treatise for the medical student of the main facts of human embryology. Minot's new book is a laboratory guide, mainly in the embryology of mammals. Thus the teacher of embryology is furnished with a fairly complete 'up-to-date' equipment of the literature in his subject for the use of his students.

Minot's laboratory text-book is written from the standpoint of the anatomist rather than of the biologist. In this point of view lie both its limitations and its excellencies. It is the outgrowth of the actual experience of one of the best known of the teachers of embryology, and hence is strongly individualized. Too much praise can not be given to the large number of new and beautifully executed