A NOTE

ON

THE NEW HOSPITAL AT ANTWERP.

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WITH REMARKS ON THE ADVANTAGES OF THE CIRCULAR WARD SYSTEM OF HOSPITAL CONSTRUCTION.

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NOTE.—The original plans for this hospital, providing eight circular ward towers, each of two stories in height, were sent in at a public competition in the year 1872. Their author was M. Backelman, an architect, residing at Antwerp. They were approved by the Hospital Committee and by the authorities of that city, and received, in 1873, the first premium in the competition. According to rule, they were next submitted to the central authority in Brussels, "Le Conseil d'Hygiène," and after considerable delay and discussion they were, in 1875, reported on unfavourably by Dr. Vleminckx—so far, at least, that certain changes in them were insisted on. To these changes M. Backelman objected, and indeed he declined to make them. Two of his pupils, however, MM. Bilmeyer and Van Riel, at the urgent request of the Antwerp "Administration des Hospices," submitted a modification of the original plans, and in 1876 these were agreed to by the Brussels authorities. The circular system was not hereby interfered with. The foundations of the buildings were commenced in 1877 and were finished in 1878. Since then the works have been continued, and now the edifice is completed, but awaits the introduction of the flooring and internal fittings.

My own ideas on the subject of circular wards were explained in a paper read at the meeting of the Social Science Association held at Cheltenham in August, 1878, and were forthwith published in a separate pamphlet. It was only in March, 1879, that I heard anything of the Antwerp hospital. I immediately sent to M. Backelman and M. Vleminckx copies of my pamphlet, and since that time I have, through the kindness of my former pupil, Dr. Peter Thomson, of Brussels, made myself acquainted with the progress of this new and interesting hospital. I have also had reports upon it from two other pupils—Dr. Easmon, now of Fort Quetta in Africa, and Mr. Stonham, at present acting as surgeon on board one of the Union Line African steamships, the latter of whom brought me quite recently from M. Backelman the plan of the buildings, as they are now completed, a reduced copy of which has been made to accompany this communication.

On comparing this plan with one which I obtained in 1879, I find that, besides certain deviations in the arrangement of the administrative departments of the hospital, the circular ward towers are placed further apart from each other, the plot of ground occupied being itself somewhat larger than in the first plan. Besides this, I observe that the necessary ward offices (water-closets, lavatories, etc.) have been placed beyond the ward towers as separate constructions, in accordance with the method represented in my pamphlet, whereas no such arrangement had appeared in the original Antwerp design.

The frontage of the plot of ground on which the entire establishment stands measures about 188 yards, and its depth from front to back is about 247 yards; the entire plot, which is wider across the middle, contains about 11 acres.

The buildings are of red brick, with courses and finishings of yellow stone. The cost of the buildings alone is said to be about £64,000; and, when these are completely fitted throughout for the reception of patients and the administrative staff, nearly £120,000 will have been expended. The proposed uses of the several parts are indicated on the accompanying plan. The corridors of communication form open cloisters, and will be provided with tramways—a means of transport which will also be adopted throughout the basement, lifts being provided at certain points.

Each circular tower is about 78 feet in external diameter, so that the wards, two in each tower, are about 66 feet in diameter, somewhat larger than in my own plan, which allows about 61 feet. There will be twenty beds in each ward, arranged next to the wall, with a window or door intervening between every two beds. Each patient will have a ward-space of 2,744 cubic feet; but, making a deduction for the necessary partial occupation of such space, there will be an actual air-space of about 2,500 cubic feet for each bed.

In the centre of the wards, there is to be a lift, and also vertical shafts, with inlets, for the admission of air, which is to be warmed, when necessary, by a heating apparatus placed in the base of each tower. The outlets for the egress of the impure air are to be in the wall at the circumference of the wards. A system of propulsion by means of a steam fan, to be worked from the engine-house in the rear of the ground-plot, is to be provided, so that, at will, fresh air can be driven along underground channels into the warming chambers in the basements of the several towers, where, in hot weather, the air can also be cooled. It is further provided that the exit air-shafts shall be in connection with the flues of the furnaces in the warming chambers. It is calculated that 5,500 cubic feet of air per bed per hour can be made to pass through the wards if required.

The circular wards will be on one side for males, and on the other for females. Some will be for children, some for infectious cases, and so on. Besides the 320 beds thus provided, there will be from 100 to 120 additional beds in smaller or single wards, for special purposes, such as for particular operations or private cases.

It is expected that the establishment will be opened for use by the ensuing autumn, or, at the latest, by the end of this year.—J. M.

REMARKS.—As the paper in which Mr. Marshall first elaborated the circular system was read before the National Association for the Promotion of Social Science in 1878, it may not be out of place to give here an outline of the grounds upon which the suggestion was made. The paper, together with remarks and illustrations by Mr. P. G. Smith, has been republished in pamphlet form*; Mr. Marshall deals with the general question of the adaptability of the circular form to the requirements of a hospital, while Mr. Smith investigates the various questions of cost and mode of construction, which come especially within the province of the architect.

After the site upon which a hospital is to be built has been determined on, the points of most essential importance, are those which relate to the actual form and method of construction of the building itself. Certain well understood conditions have to be fulfilled with regard to (a.) freedom of frontage, and exposure to air and light; (b.) the wall space, floor space, and cubic space allotted to each patient; (c.) the ventilation and warming of the wards; (d.) the number of patients under one roof, the isolation of the wards from each other, and from their sculleries, lavatories, water-closets, etc.; and lastly (e.) the detachment of the administrative from the sick department. The pavilion system has been devised to meet these requirements, and it is the object of Mr. Marshall's paper to show that the maximum of advantage is obtained by choosing the circular form for the wards. Each desideratum may be examined separately. A circular ward would be uniformly free to all quarters of the compass, except at one point, where an open or partially open corridor would connect it with the other wards, or with the offices, so that this form must give freedom of frontage, and must also permit of the freest possible access of light and air. If it be true, as has been stated on good authority, that "the worst wards are those where least air and light are provided," and that "a closed court with wards around it is the worst arrangement," then, since a circular ward is the inverse of this last named plan, it would follow that this form is best adapted to fulfil the desired conditions, "its uniformly rounded exterior, receding from all adjacent buildings, would receive light, air, and wind from every direction." Mr. Smith points out that, on this part of the question, the circular form is peculiarly attractive to the architect, who, when dealing with oblong wards, is sometimes compelled to place one long face of a ward, full against a prevalent wind, or to deprive it of its proper complement of sunlight, or free air space; with the circular form the wind can only strike full face at some single point of the circumference, and since this recedes, not along a straight line, but along a curve from its point of closest proximity to other premises, there is the least possible interference with neighbour's rights to light and air.

With regard to the wall-space, floor-space, and cubic space for each patient, the circular form offers certain evident advantages, except in the case of very small wards. It is not adapted for wards with less than eight beds; but, for wards containing about twenty beds, a little calculation shows the capabilities of the system. The two systems, the oblong and the circular, may be compared on the basis of a ward to contain twenty-two beds, allowing 8 feet of wall-space to each bed. A circular ward constructed to meet this would have a diameter of 61 feet, an internal wall-surface of 191½ feet, and would afford a floor-space of 2,922 square feet. An oblong ward 30 feet wide, to fulfil the same conditions, would have to be 88 feet long; the internal surface of

* On a Circular System of Hospital Wards, by John Marshall, F.R.S., etc., with Remarks and Illustrations by Percival Gordon Smith, A.R.I.B.A., etc. London: Smith, Elder & Co., 1878.

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wall would be 236 feet, while the floor-space afforded would be only 2,640 square feet; the circular ward, therefore, would give 133 square feet to each bed, the rectangular ward 120 square feet. From the form of the floor, and its greater dimensions, it follows that the beds in a circular ward would be more widely separated from those opposite, owing to the large central area that would be afforded; thus, in an oblong ward 30 feet wide, the distance from the foot of one bed to that of the bed opposite to it would be 18 feet; in a circular ward (61 feet in diameter) it would be 48 feet; the quantity of air between the patients would of course be greater, and the central space might be utilised for dining-tables, tables for dressers and nurses, and other conveniences. From what has been said with regard to floor-space, it necessarily follows that the cubical air-space for each patient would be relatively greater in the circular than in the oblong ward, here supposed; with a height of 15 feet in each case, the oblong ward would give 1,800 cubic feet per patient: the circular would give 1,995 cubic feet.

The ventilation of a circular ward would, it is thought, be easily carried out. Horizontal currents of air would sweep more readily and uniformly around the external surface of a circular than an oblong building. For the purpose of "natural ventilation," every such horizontal movement of the outer air would become available, from whatsoever quarter or side it came. Openings arranged in windows or walls, or both, would admit air on every, or on any desired, side. "Sharp draughts across the wards, down-draughts on the walls opposite and relatively near to open windows, deficiency of movement of the air with certain winds, and the unequal or opposing extracting power of two or more fireplaces would not exist." Mr. Smith considers that it would be advisable to have central extraction-shafts for the removal of foul air, though recognising that some of the apertures in the external wall would usually act as outlets, while others acted as inlets, the particular set discharging either function depending no doubt on the direction of the wind. The warming of the ward would be most advantageously affected by a central source of radiating heat, supplemented where necessary by hot-water pipes around the circumference.

As to the number of patients under one roof, this would very much depend on the purpose for which the hospital was required. One story, where the space covered by the whole building was of no moment, would be the most advantageous arrangement, and in fever hospitals would probably be necessary. But, where land was valuable, two or three such wards as have been described might be built one above the other, forming a circular ward tower, which would contain sixty-six patients. The various wards in the same tower would be reached by a staircase opening into the connecting corridors, and not directly into the wards. In the same way, all the water-closets and ward-offices would be disconnected from the wards themselves, and from excrescences, as it were, from the corridors. The circular form would lend itself very well to an efficient system of ward administration; the central area would form the natural domain of the nurses, who from that coign of vantage would be able with ease to command every patient in the ward, each bed being almost equidistant. Such a ward, too, would be easily kept clean, since it would offer no inaccessible corners to act as traps for dust, scraps, and such like "unconsidered trifles."

All the administrative buildings, the residential and official rooms, the operating and clinical theatres, and the out-patient and dispensary departments, "would be arranged in quadrangular blocks, from which the circular blocks, or ward towers for the in-patients, would be more or less widely detached, being communicated with only by the open or partially open corridors."

With regard to the cost of construction, Mr. Gordon Smith is of opinion, that while the walls would cost rather less to erect than in the case of rectangular walls, the flooring and roof would be more costly; the window sashes, glass, and doors, however, would not need to be curved, and, on the whole, he believes, "that the difference of cost between a circular block of wards, and an ordinary pavilion, for a corresponding number of beds, with equal space per bed, would be but slightly in favour of the straight building." As to the artistic possibilities of a hospital with wards on the circular principle, Mr. Smith expresses himself very decidedly: "in skilful hands," he says, it "would lend itself in the most happy manner to the production of buildings which would undoubtedly be the pride of the towns possessing them," and he instances the tomb of Cecilia Metella at Rome, the Baptistery at Pisa, and the Albert Hall at South Kensington, as proving the favour which circular buildings have found with artists from remote times down to the present day.

At the Medical and Sanitary Exhibition at South Kensington last summer, some of our readers may remember to have seen a drawing made to illustrate Mr. Marshall's system, by Mr. Francis E. Jones,

architect, representing a hospital on the circular ward system, adapted to a confined site such as that which may eventually be available for the University College Hospital. Four circular ward towers occupy the angles of the site, which is, roughly speaking, quadrangular; each tower contains three stories of wards, accommodating 54 patients in each tower; beneath there is an arched basement, and above a glazed day room for convalescents. The centre of the site is occupied by the administrative block, which takes the form of a Maltese cross, and contains all the necessary staircases. The ward towers communicate with the central block by cross-ventilated corridors.*

MEDICAL RUBBING.

Read in the Section of Medicine at the Annual Meeting of the British Medical Association in Worcester, August, 1882.

By J. FLETCHER LITTLE, L.R.C.P.Ed., Ben Rhydding.

MEDICAL rubbing, when skilfully done, is one of the most effective and powerful remedies that we possess. If it is done by ignorant or untrained hands, it is capable of doing immense injury.

Medical rubbing can restore the wasted muscle, can unloose the stiffened joint, can promote the enfeebled circulation, can bring back sensation to the benumbed limb, can soothe the irritated nerves, and can promote digestion and assimilation by causing healthy waste and excretion. The principles of medical rubbing are simple and easily understood, so that any medical practitioner can train a suitable person in a few lessons.

The rubber should be strong and healthy, bright and cheerful, with plenty of energy and intelligence. A stupid lout cannot make a good rubber.

The hands of the rubber should not be too small nor too large. They should not be bony nor clammy, nor horny nor doughy. They should be firm, warm, supple.

The position of the rubber should always be that of perfect ease. No one can rub if they are craning over a patient, or in a cramped or constrained position. The patient must always be placed in such a posture that the rubber is perfectly at his ease. If this is not done the rubber soon tires, uses unnecessary force, hurts the skin, bruises the muscles, and does more harm than good. The position of the patient should also be one of perfect ease. No muscle should ever be rubbed except it is soft, and no joint except the skin over it is relaxed. The skill of the rubber is greatly aided by the science of physicians in placing the muscles and joints in the most suitable position. The patient should be lying down on a low bed or couch, and the rubber sitting close to or standing by him.

The limbs should always be rubbed from the extremities upwards and the trunk from above downwards. The rubbing I am going to demonstrate to you is a combination of what I learnt at Paris amongst Professor Charcot's cases, and at Philadelphia last autumn, when I had the great privilege of seeing a dozen or more of Dr. Weir Mitchell's cases undergoing what is now called the "rest cure."

It is a combination of the "skin friction," "French massage," "muscle rolling," and "kneading," "deep thumbing," and "medical calisthenics," or the Swedish movement cure, which I shall fully explain in the demonstration.

Many attempts have been made to supersede the human rubber; and if any of you are in London, I should advise you to visit the Zander establishment above the Soho Bazaar, Soho Square, Oxford Street; where you will see some series of most costly and ingenious machines for doing what any medical rubber can do with his own hands.

Dr. Roth and his son, Mr. Bernard Roth, have shown what the concentrated will can do when brought to bear on an enfeebled muscle. Gentlemen, you can now combine every advantage of all these systems by the simple means I shall now show you.

* A ground plan and full description will be found in the *London Medical Record*, for July 15th, 1881, page 296.

"LA JOIE FAIT PEUR."—A curious incident is reported in connection with the recent accident to the Great Eastern Railway express train. A woman living near Ely, whose daughter was in the train, was very much troubled about her safety; and, on her reaching home with but little injury, the mother became so overjoyed, that she was seized with an apoplectic fit, and has since died.