NOTES UPON SCHOOL BUILDINGS.

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(FELLOW.)

SO much has been said and written of late about school buildings that it is difficult to continue the discussion without finding oneself upon familiar, well-trodden ground. On the present occasion I propose to restrict myself to the indication of a few weak points in school design, in the expectation that by discussion in this Congress a considerable improvement may be made.

Buildings can only be used to the best advantage when they are in the hands of trained teachers, who thoroughly understand the labour-saving, health-developing devices designed for their convenience and comfort.

Our business to-day is to consider these buildings in relation to the health of the human beings whose work and training are carried on within them.

There can be no question that the health of the teachers and children will be largely increased by the work now being carried on under the Acts of 1902 and 1903, to improve the "non-provided" school buildings. The large number of these buildings which are found to be structurally deficient would seem to indicate that the heads of the Education Department have been very lax in the past, or that the system of inspection has been radically wrong. Probably the backward condition of these "non-provided" school buildings is due in great measure to the fact that reports upon the structural and sanitary condition of the buildings have been made to the Education Department by inspectors appointed to examine the children, and not by persons skilled in designing and constructing school buildings.

ADAPTED BUILDINGS.

There is still much good secondary teaching done in adapted buildings, in large private houses, altered and extended to be as suitable as may be for school purposes, but the work in such buildings is carried on under

serious disadvantages, as compared with similar work in specially designed buildings.

NEW BUILDINGS.

The floor space must depend not only upon the kind of desks intended to be used, but also upon the rapidity with which the air inside the building can be changed, and the requirement that every part of the room shall be well lighted.

The experience of teachers, medical officers of health, and architects in America, on the Continent, and in this country, indicates that fifteen square feet of floor space and 200 cubic feet of air space per pupil should be the minimum provision for class-rooms in which there are adequate means for warming and ventilating. That is the minimum required for health. The Board of Education has recently fixed the floor space for secondary schools at eighteen feet, but *ten feet* continues to be the official minimum for elementary schools, and thirteen and sixteen feet (according to the kind of desk used) for the higher elementary schools.

Medical officers of health are continually urging that classes should be reduced in size, and that the air space per child should be increased. Yet it is ordained by the Education Department that the children in the elementary schools may have only *a trifle more than half the floor space and air space* given to children of similar age in the secondary schools.

Surely we may claim that as 15 feet has been shown by universal experience to be the minimum healthy floor space, 10 feet should no longer be officially recognised as sufficient.

Class-rooms for twenty-five or thirty need not be more than 12 feet high, or even less, provided the means for ventilation are suitable and sufficient. Economy in the height of rooms is more commendable than a reduction of the floor space below the acknowledged minimum healthy standard.

ASPECT AND SITE.

It is not always possible to secure the most suitable aspect for a school building in a town, owing to the limited extent of the site, the presence of high buildings near the boundaries, and other causes. Much, however, may be done by avoiding the temptation to set the building's best elevation parallel to the street regardless of the aspect, as is too often done. Sunless rooms can in most cases be avoided by judicious planning.

Teaching cannot be efficiently carried on in proximity to the incessant noise and dust arising from traffic upon a main road. The neighbourhood of factories, mills, electric light and power stations, railways, tram-lines,

and similar noisy and dusty situations, should be avoided when selecting a site for school buildings.

PLAYGROUNDS.

The playgrounds in this country compare favourably with those in the large cities of America. A larger proportion of the space than is usual should be covered in and ventilated at the top, especially for the juniors, so that most of the games could be carried on regardless of wet weather.

The surfaces of all playgrounds should be smooth without being slippery and formed of materials, such as asphalt or good granolithic cement, which do not work up into dust. The surfaces should also be compact so that nothing adheres to the boots, durable, not liable to be kicked up or worn into holes, and well drained. Gravel, cinder ashes, shingle and loose materials are unsuitable.

SANITARY CONVENIENCES.

In elementary schools these are usually placed some distance from the school building proper in a corner of the playground, and children must pass through the open air to reach them. This arrangement is seldom found, except in this country. It has long been generally abandoned for girls' secondary schools, although in some modern schools of this type I am sorry to say it is still found.

When we recollect the low, dark, unventilated outbuildings in which mean and unsanitary fittings were placed at most of the elementary schools previous to 1870, and continued in many cases down to the present time, we must recognise that the regulation of the code which insisted that there should be considerable air space between them and the school was justifiable and necessary.

Now, however, when excellent well-designed cleanly fittings abound, and floors can be made of impervious materials, this regulation is no longer necessary. So long as these conveniences are under reasonable supervision, and are disconnected from the school proper by a well-ventilated lobby or covered way, no danger to health can arise from connecting them to the school building, and the hardship of sending children, especially juniors, out from warm class-rooms in wet and cold weather can be avoided.

CLOAK-ROOMS.

In the recent rules for secondary schools the distance apart for the cloak hooks is fixed at 12 in., *i.e.*, double that required in elementary schools.

If 12 in. is a reasonable minimum distance for cloak hooks for the

garments of the well cared for, surely a distance of only 6 in. is insufficient for the poorer and probably much damper clothes of umbrella-less children. Moreover, the official 4 ft. gangways are too narrow, especially for the use of girls; the floor-space should be further increased to give better means of access to the clothes and space for dressing. In secondary schools still more floor-space is required for seats and boot-boxes; 6 ft. is found to be a reasonable width for these gangways, which should never be less than 5 ft. wide from centre to centre of stands. Each gangway should have an external window at one end, and all parts should be well lighted when the children are present. To ensure this it is desirable that the rooms should not be less than 9 ft. high.

A suitable position for the cloak-room is near the entrance; good discipline and a liberal allowance of scrapers and rubber mats at the entrances and near the cloak-rooms would prevent much boot dust from the outside reaching the interior of the school. Polished floors throughout the building would then be possible, except, perhaps, in the cloak-rooms and entrances, where jointless impervious floor surfaces, such as asphalt or granolithic cement would be more appropriate. The maintenance of wax polished wood floors costs no more than washing the floors with water, which softens the wood and makes it less durable.

VENTILATION.

Whatever method of ventilation is used, all schools should be designed to allow large volumes of air to pass through the buildings from side to side when the windows are open, so that all parts can be readily swept by currents of fresh external air whenever desired. Windows are perhaps the most important and permanent means of securing ventilation in all buildings for educational purposes. When the windows are suitably designed and intelligently used in connection with two or more outlet flues from the ceiling and floor level to above the roof, and there are also large open ventilating fire-grates, stoves and radiators, by which warmed fresh air is admitted to the rooms, long experience has proved that class-rooms can be reasonably, adequately and economically warmed and ventilated.

In large manufacturing cities and towns afflicted by dust or fog, windows admit, with the external air, so many of the impurities which pollute it, that there is some excuse for keeping them closed on the plea of cleanliness and good reason for making arrangements to wash the air and force it into and through the school-rooms by artificial means.

Fans and other appliances have proved very useful for crowded places, factories, etc., but the scientific adaptation of them to school buildings is

in the experimental stage at present. Improvements may reasonably be expected, in the near future, in the application of mechanical means of ventilation to large schools, which will lessen the objections now existing to many of the imperfect attempts to introduce air by machinery and close the open windows of schools. The aim of the sanitarian should rather be directed to restrict the causes which deteriorate the air of cities and large towns than to encourage the boxing up of children in a series of sealed cells and the pumping in of air specially prepared for indoor consumption.

In conclusion, I venture to ask your assistance in strengthening the weak places in school buildings, etc., to which I have ventured to direct your attention. Other points, no doubt, there are which deserve consideration, but as we must progress step by step, I have dealt with some of those only which are ripe for practical handling at the present time, namely :—

Inefficiency of adapted buildings.

Insufficient floor space in elementary schools.

Excessive size of classes.

Absence of direct sunlight in class-rooms.

Insufficient size of cloak-rooms.

Unsuitable floor surfaces.

Inconvenient access and faulty construction of sanitary conveniences.

Unintelligent use of open windows.

Defective arrangements for warming and admitting fresh air.

Inadequate extent of covered playgrounds.

Last, but not least, I emphasize the urgent necessity for the instruction of teachers in the principles of hygiene and the care of children.