SOME PARTICULARS OF ADJUSTABLE SCHOOL FURNITURE.

First seen in Continental Schools.

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THE present time, when Education Acts are placing additional responsibilities on the shoulders of county councils and municipalities, is an opportune time for all who are interested in the well-being of growing children and adult students to direct attention to the urgent necessity for a hygienic revolution in the school furniture of our country. Very little attention indeed has, as yet, been given to this question by our countrymen.

That there is great variation in the height of scholars is well known. Observation shows that the difference in heights of children of the same age may vary from six to eleven inches, and these various differences in height and growth can only be accommodated by desks and seats the height of which may be easily changed.

In almost all our schools, however, from the highest to the humblest, the bodies of the scholars have to accommodate themselves to fixed seats and benches, and many evils arise from this system, even where the desks are in a rough and ready fashion adapted to the size of the scholars. A large percentage—much larger than is generally supposed—of our school children have a tendency towards eye and spinal troubles and consumption, and investigations have shown that being seated hour after hour accommodating themselves for all kinds of work to a fixed desk adversely affects boys and girls—and particularly girls. This is most harmful in the case of young children, but the inconvenience is also very pronounced in the case of the young adults, and of fully grown men and women in attendance at technical and evening classes held in elementary school buildings, or even in secondary school premises, where only the ordinary school equipment designed for children is available.

“Hygienic” desks and seats reverse the old order of things, inasmuch

as they accommodate themselves to the bodies, backs, legs, and eyes of the users. They provide, in addition, the natural slope required for reading, writing, and drawing, and the height of desk suited to the length of the scholar's body. In short, "hygienic" desks and seats should be so

KINDERGARTEN -- STANDING.

KINDERGARTEN—READING.

designed as to lead each person almost unconsciously to assume a natural and hygienic position; and supports should be provided in the case of very young children, where necessary, in order that the correct position may be maintained with a minimum of strain.

KINDERGARTEN—DRAWING.

In the few adjustable desks at present available the movement is a vertical one only, and the height is laboriously altered and fixed by means of a key, a screw, or a pinion, the slope of the desk remaining fixed, or

nearly so. The principal defects of the key, screw, or pinion desk, from a practical point of view, are that such desks are not readily adjustable, also that accidents happen to the fingers and hands of the persons using them. Other defects exist in regard to fixed slope, &c., which those who have made a careful study of the question from the hygienic point of view may deal with more fully than I can possibly do to-day.

The collection of *pupitres hygiéniques* to which I wish to direct your attention have neither the key, the screw, the crank, nor the pinion movement, and have been designed in accordance with hygienic principles. I met with them while visiting Continental schools some two years ago, when they struck me as being a great advance on anything I had previously seen.

I inquired into their history and discovered that they had been

ELEMENTARY No. 1.

ELEMENTARY No. 2.

invented by M. Mauchain, of Geneva, and that a Special Commission of School Hygiene appointed by the Swiss Government—who give a great deal of attention to the subject of school hygiene—had, after rejecting all key, screw, and pinion movements, selected these desks, and adopted them as the official patterns. At the Paris Exhibition of 1900, in the Hygienic School Furniture Section, they gained the only gold medal, in competition with Continental and American “hygienic” desks.

Specimens of the desks were imported by the West Riding County Council shortly after my return to England, and since then, under the direction and guidance of Miss Alice Ravenhill, the firm of Illingworth, Ingham & Co., Ltd., of Leeds, have been making experiments with a view to improving the *desks* and to producing *seats* which may be as satisfactory as is the movement of the desks—that is to say, we are in search of a

series of desks and seats for elementary, secondary, and technical school purposes which are readily adjustable for the use of children and adults. I give you a series of illustrations in order that you may have an opportunity of seeing the present results of the experiments and of examining them closely.

As regards experiment and improvement, the *desks* only have thus far received attention, and they are considered to be now fast approaching the satisfactory stage; the *seats*, however, are not regarded as nearly satisfactory as yet. The first series of experiments are in progress, under the direction of Miss Ravenhill, and it is hoped, quite soon now, to greatly improve the seats. An adjustable seat, single pedestal, with a rise of

SECONDARY No. 1.

SECONDARY No. 2.

4 ins. in the seat, and of 2 ins. in the back rail, is just on the point of being produced.

The movement of the desks is, I think, satisfactory. It is so simple that it can be easily manipulated by a child, and this without danger. Further, I have seen desks that had been in use for ten years, showing but slight signs of wear. The movement, therefore, is strong, and the desks maintain their rigidity.

Examining the desks in detail, one can notice a number of interesting points.

Turning to the *Kindergarten* desk, you notice that the child can work at it sitting and standing, that it gives the natural slope for the eye for reading, and that whilst reading the head may be easily held up and the back kept straight, also that the top, turning upon its hinges, the under-side answers the purpose of a blackboard on which the little ones may

practice in large-hand their first steps in writing and drawing, a left arm support being provided so that the correct position may be maintained without strain. Instead, however, of the underside being black, it is coloured a deep brown (*brun foncé*), which is better for the eyes.

The *Elementary School* dual desk is so adjustable that the children can work at it sitting, with the desk quite flat, or standing, with the desk also quite flat at its greatest vertical height when necessary, and it can be fixed quite flat at any intermediate height; in addition, the slope of the top of the desk can readily be given any angle within the extreme limits of height.

The *Secondary School* single desk has the same simple means for obtaining a variety of adjustment, and I may perhaps here state that in my opinion *all schools should really be furnished with adjustable single*

SECONDARY, No. 3.

desks and seats to ensure that each scholar may get the adjustment that exactly fits his or her body. No matter how carefully one selects the pairs of children for dual desks, it is almost impossible to find *fac-simile* pairs. At the best one can only average matters as regards adjustment with dual desks, but even this is infinitely better than fixed desks can possibly be made to be. *It is to the single desk that I wish to direct particular attention.*

For *Technical School* purposes the following desk is being used in rather small technical schools in the West Riding of Yorkshire. The pattern was decided upon in view of a desire to utilise the same accommodation partly for ordinary drawing, partly for building and engineering students, partly for commercial students, and also for women's classes in

cutting-out, dressmaking, etc. The desks have been in use for two sessions, and have given great satisfaction. This desk is largely in use in the Swiss professional schools for girls, for domestic arts classes, including cookery, starching and ironing, etc.

For *Building, Engineering, and Architectural* drawing, a somewhat larger pattern, which has an attachment at the side for carrying colours,

TECHNICAL, NO. 1.

TECHNICAL, NO. 2.

instruments, etc., is sometimes adopted. This type of desk is in use at the Polytechnic, Zurich.

Some excellent features which may be claimed for these "hygienic"

ENGINEERING, ARCHITECTURE, ETC.

desks are that (1) they relieve the strain on the eyes, (2) they minimise the strain on the spine, (3) they enable the lungs to have a freer play,

(4) they provide facilities for change of position for successive lessons, inasmuch as the scholars may work alternately sitting and standing, and (5) *where adult evening work* is carried on in elementary and secondary schools, men and women of from 20 to 30 and upwards have not to be squeezed into a low fixed desk built for children, but may get a desk of a suitable height.

I had intended to deal with the question of school furniture only and to end there, but there are one or two other matters noticeable in certain Swiss class-rooms which may be of interest to you.

To facilitate the sweeping and cleaning of the floors of the class-rooms, and especially is this the case at Geneva, the desks are mounted on parallel forged iron rails, and can be run backwards and forwards across the room

CLASS-ROOM NO. 1.

on rollers (some inches in length, but not very thick) placed underneath the wrought-iron casing. The caretaker can thus easily push the desks in rows to either side of the room, and thoroughly wash or brush the floor without difficulty or obstacle.

To deaden sound and facilitate washing, a species of cork linoleum has been fixed to the floor in several schools recently erected, the cracks being filled in to give an unbroken surface from wall to wall. A strip of wood runs round the skirt-board to prevent dust from accumulating between and underneath the linoleum and the wall around the room. In schools just approaching completion, a flooring, which is a species of concrete in which a hard wood is the principal ingredient, is being tried by the architect.

All boards in the schools are of a deep brown colour—a colour approved by Swiss oculists, because it reduces reflection and is restful to the eye. The tops of all desks are coloured dark brown; the iron work is black. The walls are painted a water green (*vert d'eau*), so that they can be washed. The wainscoting of granite (crushed small and in three sizes—Nos. 1, 2, and 3), set in cement mortar, is also painted water green, but of a slightly darker tone. The blinds are water green in shade, and are pulled or pushed *up* from the bottom of the windows. On the sunny side a second blind, a white one, is added; this white blind is placed between the green blind and the window, and is pulled *down* from the top. It is used to exclude the direct rays of the sun.

A person on entering a class-room in Geneva experiences a pleasing and restful feeling to the senses from this combination of colour.

CLASS-ROOM No. 2.

There is one other interesting item which I may perhaps mention, and it is that the floor of the gymnasium—and a gymnasium is attached to each Elementary as well as to each Secondary School—is of cork parquet, treated with a preparation which prevents the feet from slipping on the impact. This cork flooring is easily renewed where it becomes worn, and has been introduced to reduce the jar on the boys and girls, and to minimise and almost obviate dust and noise during the exercises.

The aim kept steadily in view throughout the construction of the building is the avoidance of the collection of dust.

In conclusion, I would venture to suggest to Educational Authorities that they should at least carefully consider the question of adjustable

"hygienic" desks and seats, and let us hope, should any arrive at the conclusion that it is desirable, from the point of view of national physique, to adopt such desks, that such Educational Authorities will not decide against the introduction of adjustable desks into schools simply because of the comparatively small extra cost necessarily involved.

Even the most economically minded of the authorities who are convinced, might decide to furnish, with adjustable desks and seats at least,

- (a) The two or three class-rooms in such of the *elementary schools* used for evening school purposes *by adults*: and
- (b) All the class-rooms in secondary and technical schools which are used for ordinary class-teaching purposes, as it becomes necessary to refurnish.

Many authorities under the powers of recent Education Acts, will have to consider the absence or deficiency of provision for pupil teachers, secondary (boys and girls) and technical education in their respective areas, and will, I have no doubt, be led to the conviction that new schools must be built, and existing ones extended to meet the needs of many town and country districts in the above respects, and here I venture to throw out the suggestion that

- (a) By the addition to the main building of a few specially technical rooms, and
- (b) By the adoption of furniture adjustable for use by children and adults,

a new secondary school for boys or (and) girls may be planned to largely meet the three-fold needs of pupil teacher centre and secondary school during the day, and of technical school during the evening. The idea of erecting such a combined building to meet the needs of the three classes of students, may make the provision of the building appear more immediately urgent and therefore possible of realisation, in certain districts where the needs of any one class might not appeal sufficiently to the general public of the district with whom, of course, rests the ultimate provision of the necessary funds.

[*This Discussion applies also to the Papers by DR. THOMAS WOOD (2) and MISS ALICE RAVENHILL.*]

DR. A. NEWSHOLME (Brighton) observed that before any advance could be made teachers themselves required instruction, particularly pupil teachers, to whom

hygiene must be thoroughly taught. There could be no doubt that the principles of health should be taught in the school-room, but that ought to be a comparatively simple matter. Ventilation drill might be usefully adopted in the schools, the children taking turns in opening and closing windows, doors, &c., the reasons being given why these operations were necessary. So, too, with the taking of the temperature. Each child should in turn report the reading of the thermometer, and an explanation should be given whenever it was necessary to raise or lower the temperature of the room. Something might also be done in the way of scrubbing and dusting and cleaning the schools by the pupils themselves, and perhaps that might result in a diminution of expenditure, but that was a minor point. The great point was to raise a body of public opinion in favour of cleanliness, an opinion such as existed in some of the rural districts and villages, where the person whose cottage was not thoroughly clean was despised by the community. In crowded cities this sort of public opinion was less pronounced and had less weight, and it therefore seemed that it was necessary to re-educate the dwellers in the poor districts of towns and cities as to the value of simple cleanliness. In regard to school desks, they would be making a great mistake in condemning all school furniture merely because it was old. He inclined to the view that a frequent change of posture on the part of the pupils would counteract or at least minimise the evils arising from even the worst furniture. There must be no dual authority in this important administrative work: the medical officer of health must be at the head and responsible for the school hygiene as for all other departments of the public health. That rule, however, might not apply in the case of such large places as London, but for smaller communities it held good. Care had to be taken that the school-room did not become a centre of infection, and it was in his opinion imperative that there should be one central authority, with the several departments working in harmony for the accomplishment of one common object.

THE PRESIDENT (Professor Edgar) invited expression of opinion on the possibility of harm arising from the bad posture assumed by children at home when doing their lessons. He referred particularly to children in secondary schools, who had to prepare home lessons that required three or four hours' close application, and these pupils frequently worked in a close sitting-room, on chairs ill-adapted to growing boys and girls. Public attention might well be directed to this home detail.

DR. JAMES KERR (L.C.C. Education Committee) pointed out that Miss Ravenhill had now shadowed forth a syllabus for hygienic teaching in schools, and no doubt in future years the subject would have an important place in educational work. He would, however, like to reiterate what Dr. Newsholme had so well said—that expert teachers on the subject are neither necessary nor

desirable. The principles underlying the subject were easily understood and explained, and the real essential was a constant carefulness that the simple and elementary laws of hygiene were not lost sight of. The hygienic condition of the schools themselves must remain under the control of the medical officer of health for the district, and he did not think the question of controlling contagious diseases was one for the school doctor, but for the medical officer of health and the officers of the Public Health Department. Dual desks were positively bad, there could be no doubt as to that, and they should be replaced where possible. With three sets of seats and desks for the ordinary standards they could fit 95 per cent. of ordinary children, and he should be rather inclined to say that adjustable desks were a needless if not useless expenditure. In London no great attention was being given to the desk question, and all the furniture fitted fairly well, but the teachers did not seem to know how the children ought to sit. He considered that the whole question of defective eyesight was closely associated with the school-room, and particularly the infant-room. All minute and fine work should be eliminated from the infant departments, and the children should be made to write and figure on a large scale and as far from the eye as possible. There should be no stooping over small work; let them work on boards rather than on slates or paper, and in this direction, he believed, lay the solution of the problem of defective eyesight.

DR. R. H. CROWLEY (Bradford) pointed out that it was a difficult matter to determine how much time should be allotted to the various subjects in the time-table, and that it was not an easy matter to introduce an entirely new subject into an already overcrowded curriculum. There was no doubt, however, that teachers ought to get more training in hygiene. It was somewhat difficult to impress people with the importance of the matter, because one could not necessarily demonstrate the actual harm being done, say, by a seat two inches too high for a pupil, or by subjecting a pupil to a long physical strain. As to the construction of many of their present school buildings, nothing could be done unless they were pulled down, and this would entail great expense upon the community. But something might be done to improve the internal condition of most school buildings: In Bradford the floors of their schools were washed once a month, and the walls whitewashed once every three or four years. Again, he thought there was a limit to what the teachers could accomplish, and if they were to be asked to take physical records of children, to observe more closely individual children, and to take more interest in the subject of hygiene generally it would be necessary to relieve them of much of the clerical work which now fell to their lot, and this would involve the appointment of secretaries for groups of schools.

MR. G. W. ALEXANDER (Clerk to the Glasgow School Board) remarked that

what Dr. Kerr had said in regard to school desks applied only to day schools. Mr. Graham had been considering in his paper the difficulties of the situation where the same desks had to serve for both day and evening classes, and in his valuable paper the only omission had been as to the probable cost of the adjustable seats. At Nuremberg he had seen some very elaborate desks which served both for the day pupil and the evening scholar.

MR. A. F. SOMERVILLE (Somerset County Council) regretted that so little mention had been made of the educational authorities who were interested in the great question of school hygiene. As a member of a County Education Committee his experience was that when the members of the authority were most anxious to give their attention to such a question as that of hygiene, it was apt to be lost sight of or shelved owing to the plethora of clerical work that had to be undertaken. He confessed to having no sympathy with the speaker who had suggested that old desks should be retained in our schools, and that any evils arising from their use could be minimised by physical exercises. They might with equal justification suggest that defective drainage should be kept, and repair the consequent ills by hospitals and convalescent homes. There was a good opportunity when new schools were being built of selecting the most suitable desks and doing everything that was likely to promote the hygienic condition of the schools. He thought it would be a distinct advantage if they could educate school inspectors to the point of at least understanding something of the principles of hygiene, for at present it was too often the case that one inspector gave one set of instructions and another came immediately after with quite opposite directions. Educational authorities needed converting to the truth that a healthy body is necessary for a healthy mind. He differed from Dr. Kerr on one point, and believed that the question of school furniture was of prime importance, because undoubtedly much of the spinal trouble to which girls were liable could be attributed to the wrong position in which they sat at their work, and this was due in a great measure to bad school desks. That was a point on which he could speak from experience, and in any case there could not be a doubt that the better the hygienic conditions of a school the better the work that might be looked for from the scholars.

COUNCILLOR J. CAMERON (Montrose), as a member of a School Board, was in hearty sympathy with what had fallen from Mr. Somerville. Educational authorities were face to face with the difficult problem of how to adapt the day schools for evening work, and therefore he could not agree with Dr. Kerr that the desk question was not of vital importance. Unfortunately, the question was largely one of expenditure, and although School Boards were willing to do something in the way of improvement, there was much need for educating public opinion in the general subject of school hygiene. Stooping and round shoulders

were only too common evils, and when girls and lads after a hard day's work were attending an evening class they were very apt to assume wrong postures induced by ill-adapted desks. For this reason he thought that a good and inexpensive adjustable desk was urgently required. He quite agreed, too, with the last speaker that they should pay little or no attention to the suggestions of H. M. inspectors if they were to study at least the good of the school, and also indeed in this respect the good of the ratepayers. He had known of a School Board being asked by one of these inspectors to patch and repair an old building, and immediately after the work had been done at very considerable expense they had been ordered to pull down the whole erection. The question of home lessons was of more importance than appeared at first sight. He had frequently gone into the homes of the upper classes to find the children plodding at lessons often in bad postures and in by no means ideal conditions as regarded light and air. The children were as a rule left to themselves, and sat in various attitudes for hours at a stretch, so that for this reason he would be inclined to advocate the entire abolition of home lessons, and to suggest that all necessary preparation be done in the school under the superintendence of the teachers and at desks suited for hygienic posture. Type-writing as a subject of study in evening schools was very popular, but the desk of a day school was but ill-adapted for that important branch of commercial education. The same thing might be said of sewing, and he felt that it was neither right nor just to cramp up in those seats young people who had almost reached maturity. Of course, the ratepayers had to be considered in these matters, but he believed that on the whole there was a general awakening of public opinion in the right direction.

ALDERMAN STRANGE (Eastbourne) observed that it was a regrettable fact that although experts might devise great improvements in the matter of school furniture, the cheapest would be adopted rather than the best. With the last speaker, he was entirely opposed to home lessons. It was his experience that home-work was a device for forcing on and overworking clever boys and girls in their early years, with the result that they were what might be called used up before they reached the stern realities of life.

MR. J. GRAHAM, in reply, explained that he was not able to give the cost of the desks shown in his diagrams, but he believed they were being made in Leeds for about three fourths the price paid in Switzerland, where he had seen them in use. His object had been to devise a desk that would be serviceable both in day schools and for evening classes, and a desk that could be adjusted to either class of pupils. Dr. Kerr had been looking at the question from the point of view of the day school alone, which was a much simpler matter, and possibly that circumstance accounted for the difference of opinion. In the adjustable desks children could move quite freely, and it was not at all a case of putting

a child into a fixed position. There was great need for reformation, but a stern body of opposition had to be overcome.*

ALDERMAN T. P. GRIFFITHS (Southport) expressed the firm opinion that in order to secure efficient education in every respect there must be harmonious co-operation between the local educational authorities and the teachers. Whenever alterations were being made in school buildings it was important to get the best possible desks, and in all new schools that should be done at any cost, and in a short time matters would begin to improve. As Dr. Kerr had pointed out, most of the evils arising from badly suited desks and wrong postures could be traced to the infants' room, where a remedy for the whole difficulty might be found. If the children in their very early days were taught how to sit correctly, and impressed with the necessity of doing so, and if simple hygienic teaching were there introduced, gradually there would be built up a system that would be of immense benefit to the country, and tend to promote the increased prosperity and welfare of the nation.

DR. T. SIMPSON (Liverpool) said that stooping is an evil custom which leads to many serious results, and therefore he believed it was necessary to adapt school desks to the requirements of different pupils. If dual desks were bad, then single ones should be supplied, but there really ought to be no difference of opinion as to the necessity for taking steps to put an end to anything that is injuring the well-being and the health of the children.

MR. C. BREACH (Eastbourne) gave a short but interesting outline of what was being done in his town to improve the hygienic condition of the schools and their pupils, and expressed the view that local authorities would be justified in paying less attention to cheapness in the matter of school furnishing, and a little more to actual requirements and needs. The proper lighting and ventilation of school-rooms meant healthy children, and this was a principle that went to the roots of the existence of a nation.

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* Mr. Graham subsequently forwarded the following particulars with regard to the cost of the desks shown in his diagrams, viz., Kindergarten Dual Desk and Seat costs about 23s., Elementary Dual Desk costs about 25s. 6d., Technical Desk costs about 32s. 6d., Engineering Table costs about 70s., Single Desk for Secondary Schools, without locker or seat, costs about 35s., Single Desk for Secondary Schools with locker, no seat, costs about 40s., an Adjustable Seat, single pedestal, rise 4 inch. seat, and 2 inch. back rail, costs about 14s.