

SCHOOL BOOKS, AND THEIR RELATION TO THE HEALTH OF THE SCHOLAR.

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(FELLOW.)

THE wonderful strides made during recent years in the cheap production of admirable text-books has naturally resulted in the greatly increased use of printed books in schools. Educationists and publishers are continually co-operating to meet the growing requirements and it is evident that a great improvement is being made in regard to (1) subject-matter, including illustrations; (2) cheapness; (3) serviceableness; (4) suitability of type, paper, etc..

With the first three mentioned I do not propose to deal, leaving their evolution to those more immediately concerned. But the questions of type and materials, and the hygienic treatment of books, have a bearing on the health and comfort of the scholars which, I think, also demands attention.

All reading involves muscular effort on the part of a very important and delicate set of organs, and any cause, such as indistinct printing or bad light, which increase that effort unduly, frequently leads to what is generally termed eye-strain. Especially is this so in the young, and the ultimate result is shortsightedness or myopia, which, according to recent investigations, affects scholars to the extent of about 6 per cent. It is true that this defect can often be corrected by spectacles, the use of which seems to be rapidly increasing. In many professions there is no objection whatever to the use of glasses, although myopics are specifically excluded from certain posts, and in numerous ordinary occupations the spectacled worker is not regarded with favour. Under modern conditions of employment it is becoming a serious thing for a worker to show signs of advancing age, and the wearing of spectacles does not always improve a man's chances. In any event, no one will deny that it is better to

remove the initial causes of eye-strain as far as possible rather than to attempt to correct the effects.

As to the type and printing of school books, it is evident that publishers have already experimented to some extent on this subject, but whether with scientific aim seems doubtful. In some cases there appears to be a tendency to act as though the scholars were all short-sighted, requiring a large and heavy type with thick up-strokes and ponderous down-strokes. In others, the desire for a wide expanded face and excessive lateral spacing has led to a straggling appearance not unlike that associated with typewriting, which, if it does anything, increases the strain of reading. It seems to me that, except for the younger standards, there is no necessity

28. THE DAFFODILS.

1. I wandered lonely as a cloud
That floats on high o'er vales and hills,
When all at once I saw a crowd,
A host, of golden daffodils;
Beside the lake, beneath the trees,
Fluttering and dancing in the breeze.
2. Continuous as the stars that shine
And twinkle on the milky way,
They stretched in never-ending line
Along the margin of a bay;
Ten thousand saw I at a glance,
Tossing their heads in sprightly dance.

for a special school-book style of printing, provided the impression is good and the setting complies with certain commonsense requirements. Clearness and spacing are points of possibly more importance than size. Children should have no difficulty in reading small pica or even long primer type. A small type with lines well leaded is more legible than a larger one set solid. Of course, very small type is bad, and there seems little tendency to err in that direction, although it may be permissible even to use bourgeois for those books or parts of books which are used for reference rather than for continuous reading. Samples are submitted showing the different types referred to and the effect of leading between the lines.

The ink, of course, should be of a good black (at all events until such time as it is practicable to print with white characters upon a black

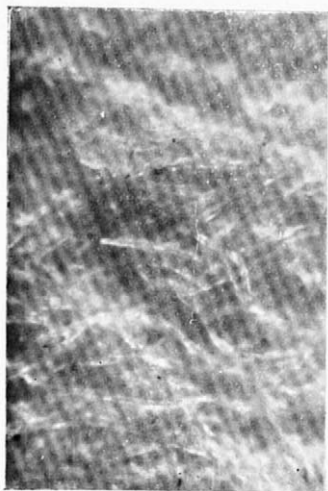
ground, when the advantage will be that only the letters will stimulate the retina instead of, as at present, allowing the large negative portion of the page to provide the stimulus).

Spacing, as has been stated, is almost more important than type. I would advocate abundant vertical spacing or leading between the lines, but I would not be too lavish with the lateral extension. Vertical spacing is advisable to relieve the tension which is necessitated in refixing the visual axes quickly and accurately upon the beginning of a line after travelling from the end of the preceding line. Horizontal spacing, on the other hand, increases the lateral motion of the eyes, which tends to muscular exhaustion and eye-strain. In reading the narrow columns of printing which are sometimes found by the side of an illustration in a magazine, we have all noticed the ease with which the eye finds the beginning of each succeeding line. That is because the vertical spacing bears a higher ratio to the length of line. But we have also in the same circumstances experienced the difficulty introduced by excessive or irregular lateral spacing.

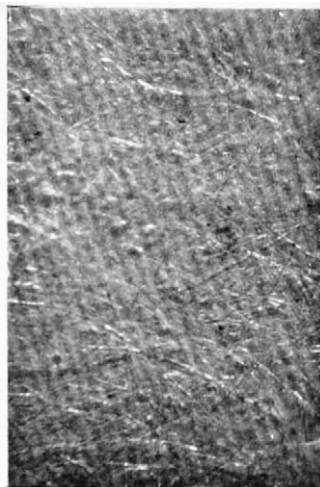
To sum up, then, as regards type and printing, we should have black ink, clear type, well leaded vertically, but with normal lateral extension. The width of the page should not be too great, and the longer the line is the greater should be the vertical distance between the lines. From three and a half to four inches is the greatest length of line permissible, and no double column arrangement should be allowed. The page should also be well broken up into sections and paragraphs, and the type should be carefully built somewhat after the manner of masonry, so as to avoid, as far as possible, those diagonal runs of clear paper which are known as water chains, and attract the eye like cracks on the face of a building.

It must not be forgotten that the normal distance of a book from the eye in reading should be about twelve inches in children under nine years and sixteen inches over that age, with the book at an angle of forty to forty-five degrees in all cases.

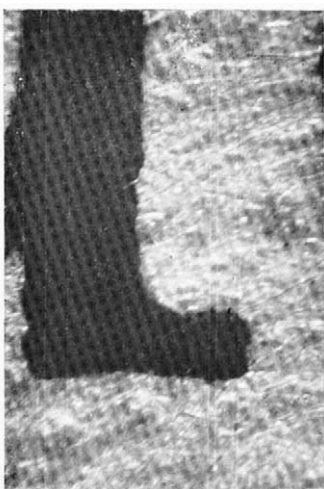
With regard to the paper most suitable for the printing of school reading books, there seems to be here again a dearth of scientific information. It is, however, agreed that a brilliant white is not advisable, while experiments which have been made in the direction of a sea-green tint have not met with great success. The general opinion and practice is in favour of a creamy colour of sufficient thickness and opacity, capable of giving a perfect impression with good black ink. It is very unsatisfactory



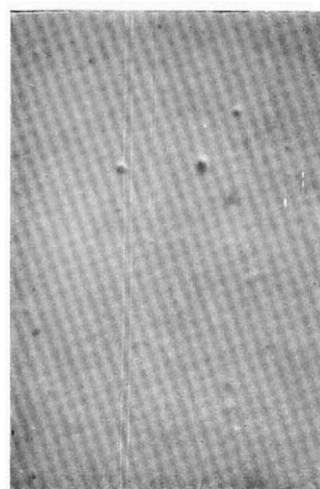
1. Hand-made writing-paper.
× 60.



2. Paper as used for school
reading-books.
× 60.



3. Paper from a school-book,
showing portion of print.
× 60.



4. Smooth paper as used
for art illustrations.
× 60.

PICA - - - - As to type, clearness and spacing are almost more important than size. Except in special cases there ought to be no necessity for anything larger than this.

SMALL PICA - A smaller type, with the lines well leaded, is more legible than a larger one set solid. Abundant vertical spacing is more helpful than undue lateral expansion.

LONG PRIMER - Children should have no difficulty in reading small pica or even long primer. A type with a rounded expanded face is more legible than one with a narrow face.

BOURGEOIS - - - A very small type is of course bad for continuous or prolonged perusal; but bourgeois may be employed in books or parts of books which are needed more for reference than for regular reading.

if the printing or illustrations on the reverse side are visible through the paper.

The question of surface texture is an important one. A very glossy finish is apt to reflect the light so as to interfere with reading in some positions. Moreover, this class of paper is expensive, and is apt to crack when folded or misused. On the other hand, a dull finish often means a matt surface, which, looked at under the microscope, seems like a coarse bed of loose fibres, offering a splendid lodgment for dirt and germs of all descriptions.

This brings me to the question which has often confronted medical officers of health in their attempts to cope with the spread of infectious disease among scholars, viz., the means of disinfecting school reading-books. It is a most difficult thing to prove, even by exclusion, that school books act as vehicles of infection, yet there is a weight of probability on the side of such a view, and this is supported by the "photos" showing the surface texture of papers, and by a number of bacteriological investigations which I have recently carried out with books from an elementary school. Indeed, the possibility of infection from this source is already well recognised, and it is the practice in nearly all towns to attempt to disinfect books in times of school epidemics. Books are opened out fan-wise and exposed to the action of SO_2 , or formaldehyde, in closed chambers; but probably none of those who adopt these measures are satisfied as to their efficacy. Indeed, it may be granted that the fumigation of books cannot be performed with the thoroughness which is necessary to ensure complete disinfection, and it is probable that a good dusting and exposure to sunlight in the open air would be quite as reliable. Steam disinfection is also out of the question, on account of its action on the leather and glutinous material used in the binding; while hot-air disinfection has not sufficient penetrating power. In some towns the medical officer is not satisfied with anything short of destruction; but with recurring outbreaks and valuable books one hesitates to adopt this drastic method without clear justification.

The subject is one which is well worthy of the attention of publishers, school managers, and health officers. Publishers might consider the use of non-porous smooth paper, and of covers and edges which would stand wiping with damp antiseptic cloths. School managers and health officers might arrange for the books to be kept in well-ventilated cupboards, and to be dusted and exposed to the air periodically.

If it were possible for each book to be reserved for the use of one particular scholar, that practice might provide a solution of the question of disinfection; for, coupled with a system of notification of sickness and

examination of absentees, we might have destruction of books used by infected scholars. This method too would result in greater care being taken of the books.

An alternative system, or a modification of the last-named, might be contrived whereby each scholar using a book should note therein his name and the date. This would tend to impart an idea of the value of books and the care necessary in handling them. It would also enable the books recently used by a sick scholar to be discovered and destroyed; and it might furnish valuable clues in tracing the course of a disease.

Of course there are many other points which might be dealt with in a paper concerning school books, points which must grow in importance with the increasing use of books. In visiting schools I have been much struck with the motley collection of books in use, including in their range all sizes, shapes, and types. Now that schools are in the hands of fewer authorities, would it not be possible to reduce the variety of books without reducing the variety or value of the subjects dealt with. If this were done they could be produced better and cheaper, because more of one kind would be wanted, and, moreover, the problem of dealing with the infected books of a given class or school would be materially simplified.

This suggestion of reducing the number of separate books is not made with the object of lessening the time devoted to reading, nor of narrowing the choice of reading subjects. Something might be done to relieve the increasing eye-strain by reverting frequently to the use of the blackboard, with wall diagrams, etc., and by the devotion of short intervals to nature study.

Finally, it might also be advisable that school reading books should be passed by some hygienic authority as appropriate to eyesight and health before being distributed to schools.

[This Discussion applies to the subject before the Conference on Thursday morning—"Schools: Building and Equipment."]

MR. W. WHITAKER (Croydon), explained the way in which he held that The Royal Sanitary Institute could play an important part in improving School Hygiene, and that they should do it because it could not be better done by any other body. It was by giving expert assistance to local and public authorities who desired to have an engineering report on an educational matter that should

be thoroughly unbiassed either from the educational or from the engineering point of view. He was glad Sir Aston Webb, as architect, had emphasised the importance of prettily designed buildings as affecting the eyesight of children, helping them to appreciate beautiful things.

MR. W. LANGBRIDGE (Bethnal Green) spoke of the welcome which teachers gave to the efforts of The Royal Sanitary Institute in endeavouring to promote health in schools, and enumerated many of the points in which a little judicious training of teachers might bring about many wholesome and commonsense reforms.

DR. G. REID (Stafford C.C.) speaking of the desirability of training children in the idea and habit of breathing fresh air for home and adult life, as well as merely school life, advocated flushing of rooms at stated intervals; and the open window as a means of ventilating schoolrooms, *always provided* the walls of the rooms were sufficiently hot to keep the rooms at the proper temperature. He also drew attention to a new plan of arranging school buildings, which would provide a verandah through which children could walk a few yards in the fresh air in passing from one schoolroom to another.

MISS RAVENHILL (London) described an excellent system of baths which she had lately visited at Amsterdam, and reported upon the improvement in the physique of the children who had for three or four years enjoyed the weekly bath.

DR. GLOVER LYON (London) emphasising the need of thorough ventilation of rooms by perfilation—that is, a through draught,—pointed out that it was also needful to supply the occupants of a room with a constant gentle flow of fresh air for breathing.

DR. HAYWARD (Wimbledon) spoke of the need of reconsidering the daily posture of children in school with regard to seating accommodation, showing that the twenty minutes' drill twice a week could not remedy the defects of constant bad posture. He also pointed out how school arrangements for drinking-water were often a source of infection among thirsty children.

MISS MORRIS (West Riding C. C.) did not see how room could be made between the knees and elbows of a child to allow for any kind of a locker to the desk when the body was in the right position.