HOW TO MAKE OUR OWN HOUSES SANITARY : WITH PERSONAL EXPERIENCES.

Read in the Section of Public Medicine.

By FREDERICK W. LOWNDES, M.R.C.S. Eng.

THE importance of a knowledge of sanitary details to every householder has been shown in a most convincing manner by recent events. Even royal householders have been compelled to set the example, and to learn the laws of sanitation in a very practical manner; the results of inspection showing that both Marlborough and Bagshot Houses were very deficient in their drainage-arrangements. Moreover, the authorities of one of our largest public schools were obliged to descend from their classical and mathematical heights to learn, among other sanitary details, that it was not desirable to have a tank containing the faecal accumulations of sixty or seventy boys in close juxtaposition to the source whence drinking-water was obtained. Householders of a less exalted class have also learned, from bitter experience, that they cannot trust to architects, builders, plumbers, or even to sanitary inspectors; but that, if they would have healthy homes, they must first learn how a house may be made healthy, and then see for themselves that the necessary requirements are fully carried out. If this be true of householders in general, how much more forcibly does it apply to those who are also medical practitioners? For not only does it behove each of us to set an example in his own house of thorough sanitation, but also to be able to advise those who may consult us on this matter as to their own homes, even to the minutest detail. In a word, it may be asked of us, "Who shall teach the teacher?" and the best answer will be, "Every householder his own sanitary inspector." As my own experiences as a householder may possibly be of both use and interest to associates, especially those who are lodgers and not householders, I will give them.

My first experience was in a house very near this building, which had the attractions of good accommodation, with a low rental. I was assured that it was perfectly healthy, but I was soon undeceived in a very sharp and disagreeable manner. Hardly had I entered and taken possession, when a back flow occurred in the water-closet, ruining all the new paint and whitewash of the room underneath, and producing other consequences which may be imagined. On seeking the cause, it was soon apparent. The water-closet was one of the old D-trap form; the soil-pipe, formed principally of lead, was so flattened in parts, that a finger could not have been passed. Nor was this all. In high winds, the most sickening effluvia pervaded the kitchen (which was a cellar one) and the rest of the basement. This I found to be due partly to defective sink-traps of the kind known as "bell-traps," removable at the pleasure of the servant; and partly to an old disused, but not properly closed, drain. These defects were all remedied, but other circumstances induced me to remove, after a tenancy of rather more than twelve months.

My next house had been tenanted by a well known associate, who was himself only a yearly tenant, and therefore not responsible for its sanitary defects. Shortly after taking possession, the landlord laid down new drains at great expense, besides converting the privy in the back yard into a water-closet; and, as a set-off against all this, raising the rent. How and where the sewage had been previously disposed of, I never knew, and hardly liked to inquire. It is enough to say that the drainage must have been most defective. I remained in that house for ten years, and it only required one or two slight alterations to make it perfectly sanitary in all respects.

My third house was the one which I now occupy, and hope to do for many years to come. It had been previously tenanted by a surgeon, who was also its owner for many years, and was built at a period when sanitary science was unknown. My predecessor assured me that when he first occupied it there was no water-closet in it whatever, only a privy in the back yard, which he converted into a water-closet; he also put in the house a water-closet, which was in the cellar close to the back yard; and, though inconveniently situated, it had the advantage of a very short soil-pipe. There were no drains under the house, nor any soil-pipe except this one. I, being this time my own landlord, at once had an interceptor constructed in the back yard, with a ventilating shaft carried up to the roof of the house. Into this interceptor all the various soil and wet trap pipes were emptied, one inch above the water-level, while it overflowed by a fall of fourteen feet into the main sewer. The kitchen sink-pipe was also conducted into one of the wet traps in the back yard. It being desirable to have another water-closet in a more convenient situation, one was chosen close to the outer wall of the house, so that the soil-pipe might pass at once through the wall and be carried outside the house. As I was in-

formed that the basin known as Jennings's patent was objected to by our sanitary authorities as causing waste of water, I procured a wash-out basin without pan, and with a flush of six gallons of water. It was continuous with a bend-pipe of porcelain, which joined the iron soil-pipe, the latter being continued up to the roof in an air-shaft. The other closets were altered and improved. The result of all these arrangements, which are perfectly simple and within the reach of almost any householder, is, that no sewer-gas ever does, or ever can, enter the house.

The advice which I would, as a result of this experience, offer my younger brethren who are about to become householders, is briefly this.

1. Before taking a house, see for yourself that it is properly drained into a main sewer.
2. If possible, have some interceptor between your house and the main sewer. The smallest back yard, court, or garden will suffice for this.
3. Have all soil-pipes carried outside the house, if possible, with ventilating shafts of the same calibre. If no interceptor can be had, this becomes absolutely necessary.
4. Let all sink, bath, and other waste pipes empty themselves into a wet trap, care being taken that the ends of pipes are not too near the grid of the trap, and are so fixed that nothing except fresh air can ascend.
5. Should the basin of the water-closet be of the old kind, with opening pan at the bottom, have it removed, and a proper wash-out basin placed in its stead, with a water-supply sufficient to flush it thoroughly each time it is used. Any expense and trouble caused in securing this will be amply recompensed. I maintain that a water-closet should no longer be a foul-smelling, ill-ventilated den, but as sweet and well-ventilated an apartment as can be secured for the purpose.

Fresh air, pure and filtered water, are such obvious requisites to health that I need only name them. There is one other matter which has given me much anxiety—I mean the disposal of vegetable refuse. Whether it be better to burn this or to bury it in cinder-heaps, is a question I hope to hear discussed, and satisfactorily answered here; for, unless decaying vegetable matters can be rendered thoroughly harmless by an ample supply of cinders, our dry ashpits must become nearly, if not quite, as dangerous as the privy of old days.

I had written the preceding, when I read, in the BRITISH MEDICAL JOURNAL, of July 7th, an excellent article, entitled "The Home as a Sanitary Unit," an extract from which will serve as a very appropriate conclusion to this paper. It will also serve, I trust, as a sufficient apology for the very elementary and almost obvious propositions I have made; and for so patiently listening to them, I must heartily thank you.

"No class," says the writer of the article, "have done so much for sanitation as the medical profession; and, indeed, it is mainly by their efforts, aided immediately in mechanical matters by the gentlemen who describe themselves as sanitary engineers, that the progress has been effected in public and private sanitation, which has resulted in the annual saving of many thousands of lives. This addition, we have lately been told, on the highest authority, amounts to a gain of two years added to every individual life, in relation only to the progress of the last ten years. It must, however, always be remembered, and this is a lesson which medical men—who are largely occupied in the homes of the people, as well as being public advisers of local communities—can enforce better than any other persons, that it is to the work of the individual, and to private initiative, that we must look for the major part of the further victories yet to be won. The State can do much in the way of regulation and assistance; but it is for the householder, for the capitalist, for the philanthropist, for the working man, each in his own class and in his own capacity, to realise the vast importance of helping himself and helping his neighbour in this great work."

A SYSTEM OF SCHOOL-SEATS.

Read in the Section of Public Medicine.

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THE increase of myopia is a question which has greatly occupied the attention of oculists. We have sought for the cause of its development during the period of youth, in the arrangement of schools. It has been said that the increase of myopia is a proof of the amount of mental development and school-life of a nation. It would be nearer the truth to say, that myopia is a proof of want of care in the proper construction of the schools. As a principal fault, we regard the bad posture of the pupils. Oculists admit that constant stooping forward of

the head is the most effective factor in the increase of myopia. The question of the improvement of the posture of the scholar involves in the first place the question of the seats. The oculist is thus led from the cause to the cure of the defect, and is so brought into the department of the hygienist. I thank the President of this Section for allowing me to direct your attention to the question of the claims of school-seats. I must beg most impressively your indulgence—the more as I have to speak a language foreign to me. We consider English a language full of beauty and richness, but also full of difficulties for a stranger.

In the first place, we have to regard the size and the measurements of the school-seats. It is absolutely impossible that a tall and a short boy will both sit equally well on the same seat, and at the same desk. It is just as unlikely as that the same clothes would fit the same pupils. Yet in many schools we find desks and seats of the same size for all. In some regulations of school-boards, I found the seats adapted according to the age of the pupils, but it is plain that the question depends not upon age, but height. The answer how the seat and desk are to be constructed, is only to be obtained by measurement. For this purpose, I constructed an appropriate seat for measurement, the different parts of which can be altered at will. With this, we measured the pupils at several schools. We found, as might be expected, that the different individuals—pathological cases being excepted—grow regularly; that is to say, all parts are proportional to the whole. Thus we require school-seats in a series of regular progression, of which all parts increase proportionally to each other. From experiments on the amount of digression which may be allowed for each shape, I found that a fair proportion was $\frac{1}{4}$. If we commence with the very smallest size of a pupil of one metre, and multiply each time by $\frac{1}{4}$, we get by eight multiplications the size of two metres. The lowest and the highest numbers are exceptionally required, so we want generally six numbers of seats, of which, as a rule, two are required in each class, with a very few of lower or higher numbers.

In taking the measurements of the pupils in the sitting position, I chose, as a starting point, the posterior aspect of the knee-joint. The average distance from the knee to the foot is found to be two-sevenths of the whole height. Thus, the height of the smallest seat has to be two-sevenths of our measure. The distance from the knee to the back we found equal to the former measure, but by preference we do not use the whole length of the thighs to sit on. The pressure on the more superficial arteries behind the knee would impede the circulation; and so 75 per cent. of its height may be taken for the depth of the seat. For the required relative height from the table to the seat I found—I confine myself here to the account of the results—60 per cent. of the height of the seat. Thus, by multiplying these numbers each time by $\frac{1}{4}$ we get a naturally progressing series of measurements. I first gave the desk the same progressive dimensions, but this was objectionable because it exaggerated the principle. The books and slates, as used in the schools, do not grow or increase as regularly as the size of the scholars; consequently we adopted only two dimensions of desks.

Next to the dimensions of the school-seats comes the relative distance between desk and seat. A different posture is required for reading and for writing. For reading, it is desirable that the positive distance from desk to seat be 25 per cent. of the height of the seat. This allows the scholar to move freely, and also to stand up between the desk and seat. For writing, however, the desk must come much closer, so that there be even a negative distance, the edge of the desk may extend over the seat. Dr. Schildback and Mr. Kunze, in Germany, have been the first to show the advantages and the necessity of a movable desk. They have introduced a desk which can be shifted up or down. Others have replaced this by desks provided with a flap that folds over, and so admits a different inclination for reading and for writing. Both methods find, on the Continent, their warm defenders and opponents. I myself have suggested another form of desk, which, I think, will answer all requirements. The top of my desk consists of two parts provided with two sets of hinges; by drawing up, the two lids are inclined opposite to each other, the inner edge of the table-top is retained behind an elevated border, which permits having a table without a border for writing, and with one for reading.

But the change of distance acquired by this method is not quite sufficient. It is therefore to be combined with another arrangement, which, at the same time, provides for a demand which has been lately put forward. For this, I beg to bring you again to the oculist's dominion.

Both eyes, used for binocular vision, are tired if they have continually to converge to an object which is near, and not straight before the face. In most schools, it is the rule to force the children to put the copy-books at the right-hand side, and parallel to the edge of the table. The effect of this must be that the pupil gets a tendency

to turn his head sideways, and to adopt a slanting posture, in order to bring both eyes at an equal distance from the object, and to produce a more symmetrical convergence of both eyes. It is more and more generally admitted that the copy-book should lie with an inclination to the left, just in front of the body.

Proceeding from these considerations, I have made my desk to turn to the left on an axis, applied at the nearest right-hand corner of the desk. This brings the desk nearer to the body at the left-hand side, and allows the left elbow to get the required rest, whilst it permits free movement to the right hand. At the same time, it remains parallel to the edge of the table.

There are other questions regarding shape and construction of the different parts of seats and desks; but they seem to me of secondary value. The form of school-furniture will vary in different countries and different places, according to local want and desire. But I think it is of great consequence that the appreciation of the value of the right sizes and dimensions, and of the relation between desk and seat, should be generally acknowledged.

INJURY TO HEALTH FROM THE PRESENT SYSTEM OF PUBLIC EDUCATION.

Read in the Section of Public Medicine.

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THE subject I have chosen to discuss with you, is one of vital importance to the life, health, and prosperity, of the greater portion of the people of this and of every country in the civilised world. At present there is a mania for excessive education in books, to the exclusion of learning the ordinary duties of everyday life. This applies particularly to girls being able to make their present and future homes comfortable and clean, or miserable and dirty. For several years, I have been frequently consulted, by parents whose children were suffering from the excessive strain put on the brain and nervous system, by the present mode of education. In consequence of this I considered it a duty, as medical officer of health to the Bolton rural sanitary authority, to make the following remarks in my annual report for 1882. "It is very important that children who have a capacity for education in the higher branches of knowledge, should have every opportunity of gaining such knowledge, and that the State should assist. It is also very necessary that a child or young person be at school five or six hours a day. But I often see children whose health is injured by over study or brain-work. Such children might very properly be excused what teachers call home-work, to enable them to assist their parents or guardians. At the same time, it would make them more healthy and more fitted to the wants of the country." I wrote the above to bring the subject before the public, with a hope that steps would be taken to impress upon the Government the absolute necessity. There is that a less rigid, and a less injurious, and harrassing, course of education ought to be adopted.

It is my opinion, and the opinion of many medical gentlemen who have spoken to me on the subject, that the present system of cramming will not produce any talent or any advancement in science or art, but that it will and does depress, enervate, make dyspeptic, and stunt the growth of many who would otherwise be strong and healthy. There are, and will be, those whom no amount of teaching would make fit for any other than manual labour, and an allowance ought to be made in every school for these in the examinations. A fair knowledge of reading, writing, and arithmetic to be the standard for those who were always intended by nature to work under the superintendence of others. It is perfectly impossible for the pupil-teachers, or even the senior teachers (except in few instances), to carry out the work they are expected to do, without serious injury to their health. A dull, morose, and irritable state of the body, with disease of the heart and brain, will follow, and many of them will die of premature decay, or be so injured in health as to unfit them for their usual duties, or any vocation, and by this means be made wholly dependent on others. A class of men and women so important to the wellbeing of the community ought to have their health taken into consideration.

It is no new thing I have brought before your notice. The ancients knew that too much learning made people mad; and Henry VIII knew the sympathy there was between the brain and the stomach. When he dismissed Wolsey from his government, he added: "Read over this, and after this, and then to breakfast, with what appetite you may." The king knew well that the letter would have such an effect upon the brain of Wolsey, that it would take away his appetite.

I will not take up your valuable time with a long list of