

ON THE MEANS OF DEALING WITH DENTAL DISEASE IN SCHOOL CHILDREN.

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THE problem of how to deal with the appalling condition of the teeth of school children is one that to-day is awaiting solution. Dental caries is without question the most important disease from which these children suffer, and one which is insidiously playing an important part in bringing about their physical deterioration. With such facts before one the answer would seem clear—establish school dental clinics and treat it; and this is the view which is generally held. The answer, however, is by no means so clear, for on carefully considering the question, one is brought face to face with the surprising fact that it would be impossible to do so, if for no other reason than that there are not the necessary number of available dental surgeons in the country to undertake the treatment. This is a most fortunate circumstance, and one that compels us to rely rather on the means of its prevention. It is the object of this paper to show, by a careful consideration of certain aspects of the ætiology, course and treatment of this disease, that such a means of solving the problem is not only the more rational and the more economical, but well within the range of possibility.

Unfortunately, despite the controversies that have raged over the question of the ætiology of dental caries, only certain important points have been more or less agreed upon. Thus it is agreed: firstly, that in a state of pure nature (whatever may be understood by that term) the disease does not exist; secondly, that with the advance of civilization it increases; and thirdly, that the micro-organisms of the mouth without the aid of certain pabulum are unable to induce it. A careful consideration of these points has led to the belief that the cause must lie in a certain factor, or factors, that has arisen with and increased *pari passu* with civilization; and further, that this cause lies in the food, the human organism itself playing but an indirect part. Caries thus is a food-disease, and the particular class of food with which it appears to be associated is the carbohydrate. *It follows that a carbohydrate-free tooth cannot decay.* This is the all-important, the critical knowledge, and the key to its prophylaxis. Such a disease does not depend upon the physical degeneration of the organism; it is an expression of

inability on the part of the organism to adapt itself to the particular environment which has been evolved during recent centuries.

If dental caries were all, we should have little need to fear it; though much of the beauty of the race would be lost, health would remain. But it is not all; it stands as the primary disease from which numerous sequelæ, or secondary diseases, may arise. It is by far the most important cause of oral sepsis—a condition the study of which during the last few years has shown that we have much to fear from it, and in it we have probably one of the most important ætiological factors of disease. Thus sepsis from the mouth may pass along the mucous surfaces, and give rise to pharyngitis, otitis media, and such-like troubles: it may pass down the lymphatics of the neck and inflame the cervical glands, which later may become tuberculous; it may be swallowed, and lead to gastric and intestinal disturbances, or be absorbed into the blood stream, giving rise to such diseases as septicæmia or endocarditis. In children all these sequelæ have repeatedly been observed; but, as a general rule, the child's wonderful capacities for recuperation and adaptation are sufficient to apparently withstand altogether, or to put off until puberty, or even later, the obvious effects of a chronic septic absorption. There is, however, one condition in children with which it is undoubtedly and frequently associated, namely, general debility. This elusive state of childhood is thought by many to be due to absorption of abnormal substances from the intestine; and, if this be so, there is no condition more likely to favour its incidence than a septic mouth, whereby the whole intestinal tract is infected, and from which the body is washed with toxins and invaded by inimical microbes. Lastly, there can be no question that it influences unfavourably all acute illnesses.

It must not, however, be thought that all sufferers from oral sepsis are necessarily affected by one or more of its sequelæ; it is only the very small minority. In country districts the relative immunity of children to its effect is sufficiently striking to suggest that there are other and perhaps more important factors in the environment of city children which are leading to their physical deterioration, and for which dental caries is so often blamed. It must be also remembered that those responsible for the literature are usually physicians and surgeons attached to hospitals, who, being mostly brought into contact with diseased

individuals, are apt to take an abnormal view of the health of the nation. It is probable that the more general examination into the physical condition of the race that is now taking place by means of school medical inspection will in a few years considerably modify many at present generally accepted ideas.

It is fortunate that the results of treatment and of the prevention of dental caries are satisfactory—nay, they are so brilliant that they give promise of a rapid decrease of the disease under a properly organized scheme. Those in a position to judge believe that the zenith of this disease has passed, and that we are now witnessing its decline. This decline is noticeable chiefly among those classes who are able to take advantage of skilled advice and treatment, and even among those which cannot, the effect of voluntary health lectures or information obtained in other ways is gradually becoming evident. These facts are most encouraging, and justify the belief that there is no disease in which the control is so entirely in the hands of the public. Most probably this improvement even under present conditions would continue; but the loss of money and life to the State and the misery and unhappiness to the individual that must occur before the improvement is very marked seem to suggest that more vigorous and energetic measures should be adopted.

So far the burden of medical treatment has for the most part fallen upon the voluntary charities, which in many places have been unable to cope with it. This inability has led to the establishment by many local authorities of clinics for the treatment of certain complaints, such as ringworm and scabies, which render children unsuitable colleagues. It has been shown clearly that the State has no right, by paying certain fees for the treatment of the poor, to make use of existing voluntary charities. Even supposing that such a method were correct, it would be impossible of adoption in dealing with the dental complaints of children. Dental surgery is a specialty, and, like any other, the true practice of it is confined to specially trained practitioners. The hospitals are few, and the output of work from them is strictly dependent upon the number of students, who are themselves in process of training and are not qualified. How, then, is it possible to meet this problem?

Voluntary effort being entirely unable to cope with the treatment of this disease, it follows that if it is needful for the general health, then

the State must undertake it. Let us grant for the moment that treatment is necessary, and endeavour to estimate what such an undertaking would cost. The subjoined estimates are based upon the cost of a clinic in a certain institution in London containing 350 children, to which a paid dental surgeon has been attached for the last ten years. This officer receives £50 per annum and attends one afternoon a fortnight and works for two hours. An anæsthetist attends about six times a year and receives two guineas a visit. The actual outlay in materials cannot exceed five pounds a year. It may be noted in passing that the success of this clinic has been remarkable; and that this success is attributed to two conditions which cannot at present be made to apply to the general public, namely, compulsory and complete treatment, and compulsory prevention.

It is assumed that a dental surgeon working five hours a day and five days a week could deal with the *immediate* needs of 3,000 children, and that within four years, all conditions being favourable, the mouths of these children would be in comparatively good order. Four-fifths of the 7,000,000 school children in England and Wales are said to require treatment—that is, 5,600,000 children. The salary of a whole-time dental officer should be an increasing one and commence at not less than £250 per annum. The upkeep of the dental surgeries, including materials and attendance, may be put at £50 per officer. By a simple calculation it follows that 1,800 dental surgeons, or a proportional increase in number of part-time officers, would be required, and the cost of the working of the scheme would amount to £560,000 per annum. This estimate does not include the initial outlay, which may be put at £40,000. In London, where, it may be taken, 600,000 children require treatment, the scheme would require 200 dental surgeons and would cost £60,000 per annum, and the initial outlay would come to £5,000. In other words, the cost would be two shillings for each child per annum.

Apart from the costliness of the scheme, there are two other important arguments that can be brought against its immediate adoption: one is that without the individual has the knowledge of prevention, and will adopt it practically, the disease will recur with almost mathematical certainty; the other is that there is not a sufficient number of qualified dental surgeons in the country to work it. This section of the profession is still understocked, and it would be unreasonable to suppose that many

would offer themselves for the posts. It follows, therefore, that the only reasonable way to meet this disease is by way of prevention.

The prevention, as has been said, is luckily simple: it consists merely in oral cleanliness; clean teeth do not decay—this is the one fact that has been stated authoritatively by dental surgeons. But if prevention is simple it requires unfailing attention, and before its effect upon the rising generations can be seen a long-continued effort will have to be made to instil the necessary prudential habits. This, then, is the first—and in the opinion of some, the only—step that should be taken, and its results awaited before any extensive scheme of treatment is undertaken, or even thought of. Moreover, it would cost very little; all that would be required would be to train the teachers, and make it their duty to convey the information to the scholars. Once make the special knowledge and the teaching of it compulsory, and more than half the battle will have been won. Further, no doctor should in future be appointed to a post of school medical officer unless he is able to furnish evidence that he has had some training in dental diseases. By such means in a very short time a body of men and women would be formed whose example and precept would be of incalculable value. In this connection it cannot be too strongly urged that the teaching should be of a uniform, clear, and elementary character, and that the rules for prevention should be simple, dogmatic, and easily remembered.

It is impossible to estimate what the State would gain by these measures. The number of men available for the Navy and Army would increase; the importance of this one fact at the present moment, when it is well known that there is not a marked superabundance of suitable recruits, is sufficient to prove the importance of dealing with this disease. A brief extract from an official report issued from the War Office will impress this importance:—“Examination of recruiting statistics for the Army for the years 1891-1892 shows a progressive increase in the number of men rejected for loss or decay of teeth from 10·88 per 1,000 in 1891 to 49·26 per 1,000 in 1902.” The statistics for the Navy for the period of one year, January 1st to December 31st, 1902, which deal with about four-fifths of the total naval recruiting, “show about 10 per cent. rejections for defective teeth by medical officers, but do not include rejections by recruiters. The recruit for the Navy under seventeen years

of age is rejected if he has more than 7, or above seventeen years 10, teeth defective or decayed, and both classes must possess some opposing molars.”

Dr. Newsholme has shown that the number of rejections from this cause has arisen because “with the increasing demand on the population for voluntary recruits a lower stratum of society has been touched.” This may be true; but it serves to show also that the disease tends to increase as a descent is made in the social scale, and is probably due to neglect of simple hygienic measures.

Valuable as these statistics are, they can only give the rejections for the men who present themselves for medical examination; they do not include “rejections by recruiters,” nor do they include “self-rejections”—this last most probably by far the greatest number. The invaliding out of the services for similar reasons has also been an important fact to reckon with; thus, 3,000 men were invalided home during the Boer War on account of defective teeth. In this case not only is there a loss of men, but the money which has been spent upon training them has also been partly wasted. This fact is obvious, and since attention has been directed to it the Government have appointed dental surgeons not only to the Army and Navy but in some cases to the Police. In doing so the Government has acted wisely, because such men in an efficient condition are necessary for the defence of the State; and if to-morrow it were felt that the State had immediate need for its own safety of the whole of the rising generation, it would be justified in spending the necessary money on such treatment.

Fortunately, then, in this disease, if reliance can be placed upon the opinion of dental pathologists, it is not necessary to wait for the knowledge of its prophylaxis. It is discovered. Only now is it necessary to diffuse this knowledge, and thereby throw the duty of its prevention upon the individual.

THE INDUSTRIAL EMPLOYMENT OF PROSPECTIVE MOTHERS.—I was at one time of opinion that the employment in factories of prospective mothers was responsible for the conditions which result in the birth of premature or deformed children, but investigation and experience do not confirm this view; unsuitable home-work, domestic or otherwise, and the carrying of heavy loads to and from warehouses by pregnant women are much more probable causes.—*Annual Report of Dr. Bate, Medical Officer of Health, Bethnal Green.*