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ON EROSION, OR NOTCHING OF THE TEETH.

BY DR REID,

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FROM THE MONTHLY JOURNAL OF MEDICAL SCIENCE FOR APRIL 1848.

THE appearance on teeth known under this designation, or that of "decay of the teeth by denudation"—"removal of the enamel by the denuding process"—"abrasion of the enamel," &c., has been described by many writers on dental pathology; but no one has as yet attempted to assign a positive cause for it; consequently, so long as that remains unknown, no available preventive or remedial means can be adopted. To those who will take a comparative view of the different authors treating of this subject, it will become evident that there are two distinct appearances; and thus there exists considerable discrepancy in the accounts given by them. Hunter¹ is the first who has taken notice of the affection. He describes it as "a want of enamel, whereby the bony part is left exposed, but neither the enamel nor the bony part alter in consistence;" and again he says,² he had met with cases "where it appeared as if the outer surface of the bony part, which is in contact with the under surface of the enamel, had first been lost; so that the attraction or cohesion between the two had been destroyed." There is so much discrepancy betwixt this and the former description as to leave no doubt that either applies to a separate affection; and this opinion is confirmed by Bell,³ who says, "Mr Hunter describes very accurately the result of superficial absorption of the bony structure, a circumstance which I have occasionally seen, though more rarely than the present abrasion of

¹ Practical Treatise on the Diseases of the Teeth, p. 24.

² Ibid. p. 25.

³ Anat., Physiology, and Diseases of the Teeth, p. 188.

enamel, with which it cannot for a moment be considered as identical. In one case the enamel is gradually and slowly removed by a regular and uniform excavation; in the other, the abruptness and irregularity of the edges show that it had broken away at once, from having lost its subjacent support. The cause in the former is external, in the latter it is within the enamel." That Bell is here no less in error than Hunter, does not admit of doubt. He ascribes the breaking away of the enamel to absorption of the subjacent bone, whereas it is the effect of caries of the bone; and this view is supported by Harris,¹ who sweepingly disposes of all assigned causes, while he avoids giving any solution of the difficulty himself.

The exposition of the appearance, as given by Fox,² corresponds with that first described by Hunter, saying, "it consists in a removal of the enamel from the bone of the tooth, as if by solution and gradual abrasion."—"The first appearance is in the enamel of one or more of the incisors becoming thinner, and appearing as if a small portion had been scooped or filed out, occasioning a slight depression."—"In other cases, there is an appearance as if a small round file had been applied to the anterior surface of the teeth close to the gums, removing a considerable portion of them, but leaving the surface exceedingly smooth." He confesses his inability to assign any cause for these appearances, conjectures that the saliva has some influence in dissolving the enamel, and that the friction of the lips may contribute to its removal. If such was the case, the whole surface of the tooth would be equally affected, instead of presenting a grooved appearance.

It will thus be seen that there are two distinct conditions of the teeth recorded by dentological writers; and without going into the descriptions of other authors, which could only be a repetition of the quotations already given from those that are acknowledged to be the best writers on the subject, let us proceed to examine into the cause of these appearances. In the condition last described by Hunter, it would appear that there is a predisposing or constitutional tendency, aided by an artificial cause. In some constitutions there exists a want of density in the bone of the teeth, which will be most frequently observed in those of a strumous diathesis; and this peculiarity placing them more under the influence of external causes, whether mechanical or chemical, when once an impression is made on the surface of such teeth, decay commences, and proceeds steadily, if not rapidly, aided by the heat and moisture of the mouth, the acid condition of the saliva, and the effect of portions of the food that have lodged and become putrescent in the dental cavities. The bone of such teeth becomes softened under these influences, wastes away, becoming excavated under the enamel, and thus, in the words of Hunter, "the attraction or cohesion between the two is destroyed;" or, as

¹ Practical Treatise on Dental Surgery, p. 207.

² Natural History and Diseases of the Human Teeth. Part II. p. 54.

Bell expresses it, "the enamel has broken away at once, from having lost its subjacent support. It may be contended that this condition is the result of local constitutional causes, a late author (Robinson) having stated, that "the labours of recent pathologists seem to show that an acid liquor is secreted by the glands of the gums contiguous to the necks of the teeth;" but before entertaining such speculative views, we would ask the question, if the condition alluded to be the result of physiological structure, how is it that the under teeth are affected in the same manner, unless the acid secretion, contrary to the laws of nature, flows upwards? In that condition first described by Hunter, and designated by other writers as notching, there appears to be no decay or disorganization of the teeth; but the appearance presented is as if a file had been applied to the front of the tooth close to the gum, and cut into it a groove, or in some cases a notch, with the deep side next the cutting edge of the tooth, the surface of which is even and highly polished. The teeth which appear to be most extensively notched are the canines superior and inferior, also the bicuspes; yet in several cases that have come under my observation, the whole of the teeth partook more or less of it. This circumstance led me to suspect that it was occasioned by friction, and my enquiries into the habits of those whose teeth were more strongly marked brought out the fact, that undue use of the brush, aided by gritty dentifrices, was the sole cause; and, in corroboration of this statement, I may say that I never met in with the notched appearance in the mouths of those who, from want of attention, allowed calcareous deposits to accumulate on their teeth, but have found it in the mouths of such only as are scrupulously clean in their habits as regarded their teeth. It is a well-established fact, that a very short time will suffice to make an impression on a tooth by means of a brush, if water is used with any rough powder. Many authors could be quoted in support of this; but one will suffice, namely Berdmore, who in the space of an hour took the greater part of the enamel off a tooth by brushing it with a very hard brush moistened and charged with a certain dentifrice. It may be asked why are the canines most deeply grooved; and the answer will suggest itself to any one who will look at the position of those teeth in the mouth. They stand prominently forth, and form, as it were, the keystone of the arch described by the five teeth on either side of the mesial line; thus, in the use of the tooth-brush, they come in for much more than their share of the scrubbing process. I have already alluded to the theory that an acid liquor is secreted by certain glands in the gums; but it cannot be supposed that the notched appearance is the result of chemical action either constitutional or external, and any arguments to prove the existence of such action may be set at rest by reference to the features of the notch as described by various authors. They all agree that it presents a smooth *highly polished* surface, and such a condition can be produced by mechanical action only, erosion being the result of

chemical action; and the belief in the existence of a chemical agent has led those authors to employ the term "erosion" instead of "decay." Moreover, a similar appearance has frequently been found by me on the teeth of those wearing badly constructed artificial pieces; the clasps of which, having cut into the teeth, produced a notch or groove, the surface of which was smooth and polished, although the shape of the cavity did not, in every instance, resemble that of the appearance above mentioned.

Among the many substances made use of as dentifrices, there is, in my opinion, none so mischievous in its effects as charcoal; and in support of this assertion I could quote from many authors who have written clearly and distinctly on the subject, among whom are Berdmore, Plenk, Murphy, Fuller, Duval, Fitch, Lefoulon, &c. On inquiry among those whose teeth present the above appearance, I find that in almost every instance they have at some period of their lives made use of charcoal. In one instance that lately came under my notice, some of the teeth were cut half-way through, and the profuse use of charcoal was acknowledged to have been the cause. There may be other substances employed that are equally active in the effects, yet they are not used in the concentrated state, while charcoal is, its powers of attrition being very considerably increased by high pulverization.

In denouncing the use of charcoal or other gritty substances as dentifrices, I wish not to be understood as disapproving of the practice of brushing the teeth; on the contrary, I would advocate it as highly conducive to their preservation, and to the comfort and cleanliness of the individual, that the brush be used at least once a-day. The occasional use of a carefully prepared tooth-powder, free from gritty particles, could do no harm; but its use might be dispensed with by those who are in the daily habit of brushing their teeth. In support of my views, I quoted the opinion of Berdmore as to the effect of gritty matter on the teeth, and the statement appears somewhat extraordinary; but I have fully tested the accuracy of it, and have preserved, for the inspection of those curious in such matters, specimens of teeth notched to various depths, similar to those described by the above-mentioned author, and which has been accomplished in the space of fifteen minutes, solely by the friction of a common tooth-brush moistened with water, and charged with finely pulverized charcoal.

I do not take to myself any merit for originality in my views as to the effects of charcoal or other gritty substances on the teeth; but I trust I have satisfactorily traced, to their undue use, the cause of appearances, to account for which has baffled the attempts of the best writers on dental pathology.



