OBSERVATIONS
ON
DISEASES OF THE TEETH,

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COMMUNICATED

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AT a period when every department of the profession, and almost every disease has its particular votaries, it is much to be regretted that so little has been done towards affording a correct history of the diseases of the Teeth, and the parts connected with them. Some of them remain even yet undescribed, and others, though occasionally adverted to, are but little understood. Yet when the importance of the organs themselves both to our comfort and health is considered, as well as the consequences which frequently result from the neglect of them, whatever tends to the elucidation of their diseases, or points out the means of their prevention or cure, will not, it is presumed, be thought unworthy the notice of the profession.

The admission of the fact that the teeth possess vitality is *essential*, before we can possibly account for some of their morbid appearances. I believe that this theory is now generally received amongst those physiologists who have paid any attention to the subject; there are however still some men of high and deserved celebrity who hold the contrary opinion. Mr. Lawrence considers “the vascularity of the teeth, a doctrine refuted by every circumstance in the formation, structure and diseases of these organs* ;” and Monsieur Blainvillet distinguishes the tooth itself (“*la vraie dent*”) by the words “*la partie morte*.” This hypothesis was also very lately taught in one of the first medical schools in the world.

I shall not now enter into the numerous arguments which may be adduced in proof of the position that the teeth are strictly speaking *organized* ; although I am convinced that this would not be difficult, either on the ground of analogy or experiment. I shall content myself with mentioning two simple and decisive facts, which neither require illustration, nor will allow of controversy.

CASE.

Mr. —, a medical gentleman in London, re-

* Blumenbach's Comp. Anat. translated by Lawrence, p. 67. note (O).

† Nouveau Dictionnaire d'Histoire Naturelle, &c. Art. “Dents.”

requested me to extract the second molaris, on the right side of the lower jaw. He had for some time past been suffering the most excruciating pain, which still continued, and which although not exactly of the nature of common toothach arising from caries, was at times so severe as to be almost intolerable. He stated that some months previously he had taken cold, and had the usual symptoms of inflammation in the membrane of a tooth ; since which time he had rarely had any interval of ease. The alveolar process and gum had undergone absorption, so that the fangs were in part exposed ; and although there was not any external appearance of disease in the tooth, yet as it was productive of so much pain and had become so loose as to be totally useless, I immediately determined on its extraction, which occasioned as much pain as usually attends the operation. I then sawed the crown of the tooth through transversely, in order to ascertain if the state of the membrane would afford any satisfactory explanation of the symptoms, and found a cavity formed in the bony substance of the tooth, communicating with the natural cavity, and filled with pus. There was not the slightest appearance of that softness and discolouration which essentially characterize caries ; on the contrary the texture of the surrounding bone remained unchanged, and possessed a remarkably firm and healthy appearance. (*Plate II. fig. 1.*) There is but one way of accounting for this. Here was a distinct case of abscess formed in the

bone of a tooth ; the membrane had been inflamed, suppuration followed, and the pressure of the pus occasioned *absorption*. How could this take place in an unorganized structure ? The other fact to which I alluded, occurred to a friend of mine, who had a small portion of enamel splintered off from the anterior surface of an incisor, so that a very minute point of the bone was exposed. Touching this point with any sharp instrument, occasions pain of the most pungent kind, although there is not the least *general* tenderness in the tooth itself.

Caries, the most common disease of the teeth, can only be explained by admitting their vitality. Some of the observations of the late Mr. Fox on this disease are not only obscure but inconsistent, and I shall take the liberty of making a few remarks on the subject, with the hope of in some measure elucidating it.

“ The proximate cause of caries,” says Mr. Fox*, “ appears to be an inflammation in the bone of the tooth, which on account of its peculiar structure terminates in mortification.” In the next page he endeavours to explain the mode in which this *effect* of inflammation takes place, by saying, “ when the membrane” lining the cavity “ becomes inflamed it separates from the bone, and the death

* Diseases of the Teeth, page 12.

of the tooth is the consequence. That this is the proximate cause of caries appears highly probable," &c. Now that the inflammation in these cases would not be confined exclusively either to the membrane or to the tooth itself, is sufficiently obvious from their intimate connection. The teeth, although organized, certainly possess less living power than any other part of the body, and therefore cannot recover from the effects of severe inflammation, and mortification or caries of some part of the crown is the consequence. But should the inflammation be sufficient totally to destroy the connection between the membrane and the tooth, then the whole tooth loses its vitality at once, and in some cases remains in the jaw, not having the appearance of caries, though it altogether becomes considerably darkened. This view of the subject will I think account for the fact that the fang is less liable to that kind of mortification which is understood by the term caries than the crown; for as the fang appears to be originally possessed of a somewhat higher degree of vitality*, it is consequently better able to resist the effects of inflammation; but when it does lose its vitality, it is from its connection with the system being destroyed, and its source of nourishment cut off by the separation of the membrane.

* It is to be remembered that in addition to the membrane lining the internal cavity, the fang is also externally covered by its proper periosteum, which is intimately connected with it by innumerable vessels.

On the same principle we may explain another striking circumstance ; that *caries invariably commences at the external part of the bone, immediately under the enamel* ; for it may be reasonably concluded that the more internal part being immediately connected with the membrane which supplies it with vessels and nerves, would be more highly organized than the external, and longer resist the effects of inflammation.

It is upon the same theory that I would attempt an explanation of the certain and regular *progress* of caries. A portion of the tooth is killed in consequence of severe inflammation, and of course becomes an extraneous body. In order to effect its removal, an increased action is set up in the contiguous portion, as in caries of bones ; but here is the essential difference in its effects upon these two varieties of structure. For the reason before alluded to, viz. the imperfect organization of a tooth, this increased action itself causes the death of that part in which it is excited, and in this manner one portion after another is destroyed. Thus the same process which in more highly organized bones is the means which nature adopts to remove an extraneous portion and get rid of the disease, becomes in this instance the cause of its continued and irremediable extension.

I believe then that inflammation and mechanical

injury are the *only* causes of caries : and I thus differ from those who assert that mere contact of a carious tooth occasions disease in one which was previously healthy. It is of importance that the truth or error of this opinion should be ascertained, and I shall therefore state the reasons which have led me to reject it ; for it has been so universally believed, that even men of science and observation have suffered it to pass as an established fact, without considering whether a more philosophical and correct explanation may not be afforded of those circumstances which have given rise to it.

The whole crown of the tooth, that part in which caries almost always commences, is completely enveloped in a covering of enamel, which is composed of phosphate of lime. Now as caries originates in the bony substance, it is clear, that for disease to be produced from any merely external cause, either chemical or mechanical destruction of the enamel must first take place. But there is no agent evolved during the decomposition of a carious tooth, which can in any possible manner act upon the enamel ; therefore the mere contact of a decayed tooth cannot affect a healthy one.

Still the circumstance is so common of disease occurring in two teeth situated close together, as to render it desirable to discover some less objectionable mode of accounting for it. I believe then that it arises from one of two causes. In the first

place, it is reasonable to conclude, that any cause producing inflammation and consequent caries in any one tooth, would with equal probability have the same effect on the one in contact with it ; and as one may be expected to have suffered more severely than the other, it would the more speedily shew symptoms of decay, and thus be supposed to *produce* the *caries* which should shortly after shew itself in its immediate neighbour.

The other cause to which I referred, is the pressure of the two teeth against each other, by which the enamel of both becomes more or less mechanically broken down at the point of contact, and thus the bony substance in both is more exposed to the action of the common causes of caries.

A considerable effusion of adhesive matter around the fang now and then occurs in consequence of severe inflammation. It appears to be thrown out from the vessels of the periosteum, and sometimes produces very distressing symptoms, which may perhaps be best illustrated by the following well marked case.

A gentleman some months since requested me to remove a molar tooth of the lower jaw, which gave him the most intolerable pain, darting in paroxysms from the tooth along the lower jaw, and

towards the ear. The tooth was loosened and somewhat raised in the socket, and pressure so much augmented the pain that mastication was rendered impracticable. The disease was attributed by the patient to exposure to cold; and as no appearance of disease in the substance of the tooth itself could be discovered, I should have hesitated to extract it, were it not for the extreme severity of the pain, and my patient's earnest entreaties. The lower part of the fang was found completely enveloped in a thick coating of adhesive matter, the result of a very high degree of inflammation. (*Plate II. fig. 2.*) In other respects the tooth appeared healthy.

In a few days however all the molares *of that side*, both in the upper and lower jaw, were affected in a similar manner, and to as great a degree as the one I had extracted; they were in the same way raised somewhat above their natural level in the jaw, and produced equally severe pain on pressure; the face was much swelled, the sub-maxillary glands enlarged, the gums highly inflamed, and the most violent pain extended along the jaws behind the ear and over the forehead. Instead of complying with his reiterated entreaties to remove several of the teeth, I scarified the gums freely, and ordered a brisk purgative and an abstemious plan of diet. The next day finding that he was not relieved, I ordered some leeches to be applied to the gums, to the external part of

the cheek and base of the lower jaw, a blister to be placed behind the ear, and that the bowels should be freely evacuated. Perseverance for a day or two in this plan totally removed the inflammation, and its consequences speedily disappeared ; the teeth became as firm as ever, and in a short time he could masticate on that side as well as before the disease took place.

There is no doubt that in such cases as this the inflammation, if not timely checked, would terminate in suppuration. The appearances above described, may therefore be considered as constituting the first stage of those abscesses which are not unfrequently formed at the extremity of the fang, and which occasionally produce extensive disease of the alveolar processes and gums. If this be correct, a former opinion, that they arise *exclusively* from the irritation produced either by caries or by a fang remaining as an extraneous body in the socket must be erroneous, for in the case above alluded to, not one of the teeth was in the least degree affected with caries.

The appearances which these abscesses assume are various. *Plate II. fig. 3.* is a representation of one rather larger than ordinary ; the sac containing the matter was lacerated in extracting the tooth. *Fig. 4.* is taken from a preparation in the collection of the late Mr. Joseph Fox, now in my possession, and is figured in his work. But the

most remarkable specimen I have seen, is one which was given me by my friend Mr. Wickender, of Birmingham, consisting of a double sac at the extremity of the fang (*fig. 5.*) the portions being distinct from each other, and each apparently connected with the canal in the fang, which is probably in this case also double.

It appears then that the diseases which have been mentioned, however they may differ from each other in their nature, have but one common cause, namely, INFLAMMATION ; and that were early attention paid to this circumstance, and decisive means had recourse to for its removal, much pain and much subsequent disease might be prevented. From the dense structure of the teeth, there is no possibility of their yielding in the slightest degree to the increased thickness of the membrane when inflamed ; and from their being less perfectly organized than any other part, absorption goes on with extreme tardiness, even where it occurs at all. From these considerations it will appear important to prevent the occurrence of inflammation, or to remove it as speedily as possible. As a general rule, whatever produces pain in the teeth must be ultimately injurious. Taking food or liquors, the temperature of which is either much above or much below the standard heat of the body, is the most common cause of disease ; and

although such particulars may appear trifling, yet to those who have seen much of the effects produced by these diseases, and the anxiety and regret of those who either still suffer from them, or have been deprived of their teeth at an early period of life, the importance of any hints which may at all contribute to their preservation will be evident.

I am aware that the opinions which I have given in the course of the foregoing observations, are in many respects different from those previously held on these subjects; but I have been careful not to make assertions upon any grounds short of actual observation. My aim has been to induce additional attention to a subject which appears to me to possess considerable interest, and thus to lessen in some small degree the extreme frequency of diseases of the teeth, which often render persons even scarcely beyond the prime of life incapable of properly masticating their food, and thus not only deprive them of their comforts, but also lay the foundation of numerous diseases dependent upon imperfect digestion.

Fenchurch Street,
Dec. 1818.