tics were discontinued for a short period. Different states of disease in respect to severity of attack, as well as circumstances of inflammation accompanying the constriction of the intestines may account for the apparent difference of treatment. In the cases here reported, the pain was overcome by smaller doses of opium, than Doct. Fisher administered; while to remove or obviate more obstinate constipation or spasm of the bowels, cathartics in larger repeated doses were found necessary.

In all cases of colic with puking, the first intention is to remove pain by opium, as soon as pain is removed, puking ceases. The second intention is to obviate restrictions of the bowels by cathartics; of this class of medicine, calomel is most to be depended on, because, in the event of nausea, or effort to vomit, calomel is retained, when other cathartics may be ejected; besides, it is believed, that calomel by its specific action on the intestinal canal, is better adapted to remove inflammation, which is believed to be the proximate cause of all the obstinate symptoms which accompany the disease.

Remarks on the Articulation of the Teeth, with the Alveolar Processes. By T. W. PARSONS, M.D. Surgeon Dentist.

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THE connexion of the teeth, with the alveolar processes of the jaw, presents a peculiarity of conformation, not discoverable in any other part of the body, and although the fact is generally admitted, that between each tooth and its socket, a degree of motion naturally takes place, they are nevertheless usually classed among the immovable articulations.

The teeth possess a degree of solidity and strength, which is perhaps not surpassed by any other articulation, and which so far as relates to their connexion with the alveoli, is almost wholly dependent on the membrane by which each tooth is united to its socket. The particular formation of the fang, and socket, is not of itself, sufficient to preserve its solidity. It seems to exercise only an indirect and limited influence in relation to the strength of the part, and presents but little appearance of that nice construction, and adaptation of one part to another, which we notice in the immovable articulations, where, the principal design seems to be, to secure strength by the general mechanism of the bones only, independent of any other means. We notice this kind of formation in all, and it is

one, which appears to be, in some measure characteristic of the immovable articulations; thus, some of the bones of the face and head, derive their principal solidity, from the peculiar formation of their connecting edges, which are either so fitted to each other, or locked together, as to render their separation very difficult. The different bones which compose the head, are in this manner, so completely secured, that they remain firmly united together, after all the soft parts have been removed by maceration and so perfect is their union, that, in the adult cranium, a considerable degree of force is necessary to separate them.

In the teeth, on the contrary, we find but little in their mechanical adaptation to the alveoli from which we should be led to infer any considerable degree of security or strength.

We observe their fangs, of a conical, or nail-like shape, perfectly smooth, and so loosely fitted in their sockets, that the slightest force is sufficient to remove them. This is particularly true of all, excepting the molar teeth, each of which have generally two or three fangs, that are not unfrequently a little curved at their extremities and which in some measure favours their attachment to the alveoli.

The above facts are made sufficiently apparent on examining these parts in the skeleton, and it is perhaps, not necessary to observe, that in comparing the teeth with the immovable articulations, I allude only to the strength of connexion which they each derive from the formation of their bones merely. Whenever motion takes place in the immovable articulations, it is usually the consequence either of injury or disease, while in the teeth, a degree of motion seems to be a necessary provision, instituted for the prevention of the concussion which must inevitably be produced in shutting the teeth together with much force, provided they were perfectly immovable in their sockets. The yielding motion of the teeth in their sockets although ordinarily obscure, is yet apparent on biting upon a solid substance, it is however, more particularly observable upon biting with a tooth, the membrane of whose fang is a little inflamed and its sensibility consequently increased.

The connexion of the fang of each tooth with its alveolus, is, as I have already observed, in a great measure effected by an organized membrane, covering the fang, and lining the alveolar process in which it is contained; and so indispensable is this membrane to the security of the tooth, that its destruction whether by disease, or injury is generally succeeded by the loss of the tooth, while, on the contrary, every other part of it,

excepting only the fang to which the membrane is attached, may be destroyed, yet, so long as this remains, its connexion is maintained unimpaired. A tooth may be broken, and its enamel completely removed by the actions of a highly concentrated acid, the vessels of its cavity drilled out and entirely destroyed, yet its connexion with the socket is unaffected, provided the membrane of its fang remains uninjured.

Although the solidity and firmness of the teeth, are not, as we have seen, directly dependent on their conformation with the alveolar processes, yet these when viewed in connexion with the other parts which compose this articulation, are nevertheless very important to it. By the alveolar processes, the teeth are enclosed to a certain extent in separate bony cavities, by which a uniform distance is preserved between their fangs, and their motion, (which but for the alveoli would be considerable) is very much limited.

Another important use of the alveolar processes in relation to the teeth, and one by which their connexion is very much strengthened, is, the attachment they afford to the gums, and to the membrane, which covers the fang of each tooth, and lines the alveolus in which it is contained.

The loss of the teeth very frequently follows from the diseases of the alveoli; but I think, that, in some cases, this may take place, rather from the participation of the membrane in the affection of the alveolar process, than, as a necessary consequence resulting from its diseased state alone, or in other words, provided the alveolus could be removed, in such a way, as not essentially to injure the membrane of the fang or parts adjacent to it, I conceive it probable, that an adhesion might take place between the membrane and the gum, sufficient to preserve the tooth in its place.

In objection to this opinion, it might perhaps be stated, that the removal of the alveoli in the advance of life, by absorption, would seem to convince us to the contrary, but it should be recollected that in these cases, in addition to the removal of the alveoli, there are at the same time actions corresponding and harmonising with it, taking place in the gums, at the extremity of the fangs, and in the membrane with which they are covered, all uniting, as it were, by common agreement to effect the removal of the teeth.

I have met with a few cases, where a partial absorption of the alveoli has commenced early in life, that is to say, in persons about thirty years of age, and which has not been accompanied with a corresponding disposition in the adjacent parts; in these cases although there is generally a considerable recession

of the gums, some irregularity and a much greater degree of motion of the teeth than usual, they have nevertheless preserved their connexion with the gum, notwithstanding their alveoli have been removed to a considerable extent. Although cases of this kind have probably been noticed by those conversant with the diseases of the teeth, yet I never recollect to have seen them mentioned by any author, with the exception of Mr. Hunter. He had probably met with instances of this kind, as he alludes to cases, where the teeth remained firm, notwithstanding the alveoli had been removed, and he seems to have been doubtful, whether it took place by a union of the membrane of the fang, to the gum, or whether, a new growth of the alveolar processes might not take place.

In those cases, in which the alveoli have been removed, without a corresponding action taking place in any of the adjacent parts, is it not probable, that such a degree of inflammation might ensue as to effect an adhesion between the membrane of the fang, and the gum with which it is in contact? The inflammation either originating first in one of these parts and communicating to the other, or affecting at the same time, the gum adjacent to, and the membrane itself.

Instances very frequently occur, where one or more teeth remain attached to the gum, for a long time after their alveoli have been removed, even where there is a uniformity of action in all the contiguous parts to expel them; in these cases the union of the fang with the gum, appears to be kept up by a small portion of the membrane, that has not yet been removed, and which, on extracting a tooth in this state, is seen only at the extremity of the fang, this alone serving for its connexion with the gum, after every other part of the fang has been entirely denuded of its membrane.

The primary teeth of children retain their connexion with the gums, after not only the alveoli, but a considerable portion of their fangs have been absorbed.

Whenever the absorption of the alveolar processes has commenced, we may easily conceive the ill effects that must necessarily result from an accumulation of tartar about the necks of the teeth, or from any other irritation applied to them, which readily disposes the gums and neighbouring parts to assume or continue that kind of action, which had commenced in the alveoli, and which would probably terminate only in the protrusion of the teeth.

The membrane covering the pulps of the teeth, previous to their passing through the gums, is described by Bichat* as being

* *Anatomic Generale.*

reflected, and in every respect relating to its character, analogous to the serous membranes. After the ossification of the teeth is completed, that portion of the membrane which lines the alveoli, it is stated, remains the same, while the other, or that part of it which is reflected, passes into the dental cavity, an arrangement which is considered as contributing, in some measure to the security of the fang in its socket.

A very similar description of this membrane is given by Mr. Hunter, while it remains covering the pulps, but after the ossification of the teeth is completed, and before they make their appearance through the gums, it is said to be gradually absorbed, and entirely removed by the time the teeth are perfectly formed.

The existence of this membrane, on the pulps of the teeth, and its perfect analogy to those of the serous class, as relates to its form and character, and to the fluid which it exhales, is a fact universally admitted, and which is sufficiently demonstrable on examining the rudiments of the teeth in a foetus of six or seven months old; but whether, as the ossification of the teeth advances it is removed, or whether, as Bichat supposes, it remains after this process is completed, I am not from my own observation prepared to say.

The membrane which unites the teeth to their alveoli, after their formation is completed, has hitherto, very generally been considered as a fibrous membrane, and answering the same purpose in relation to the teeth that the periosteum does to the bones.

If this description of the membrane be a correct one, do not the teeth present a peculiarity of structure, so far as relates to the manner of their union with the alveoli, not to be found in any other part of the body, viz. the connexion of bony surfaces, between which a slight degree of motion naturally takes place, and which have only a common periosteum interposed between them?

The result of some experiments which I have made in order to determine the true character of this membrane, have not hitherto been sufficiently satisfactory to enable me to speak with much confidence on this head.

The diseases of the membrane of the fang are of very frequent occurrence. It occasionally happens, that in consequence of great irritation of the vessels of the cavity of a tooth, severe and extensive inflammatory affections take place in the neighbouring parts, and in which the membrane of the fang usually participates.

Many of the painful affections of the face are, if cautiously examined to be traced, to the diseases of this membrane, which probably, originate either primarily in the membrane, or follow from the irritation or disease of parts adjacent to it. The effects of previous inflammation are often discoverable on the fangs of teeth that have been extracted, the membrane being very much thickened, and presenting a sort of cartilaginous appearance. Suppuration frequently takes place on the fangs of the teeth, occasioned sometimes, by the irritation arising from an accumulation of tartar around them. It also occasionally follows sympathetically, from the irritation of caries and from a variety of other causes. In some instances, the matter is contained in a little bag, pendant from the extremity of the fang, to which it is attached, and appearing to be formed by an elongation of the membrane. In other cases, the matter is spread over the whole surface of the membrane of the fang, and alveolar cavity, out of which it sometimes oozes after the removal of the tooth.

I have already mentioned, that a sympathetic inflammatory affection of the membrane of the fang, sometimes takes place in consequence of the irritation of the vessels contained in the cavity of a tooth. I know of no instance in which this takes place to such an extent, or is attended with more unpleasant consequences, than where it follows from the usual method of drilling out the nerve and vessels of the cavity, preparatory to securing an artificial tooth, provided that at the time it is performed, the vessels of the cavity are entire, and the sensibility of the nerve acute.

It is a little remarkable, that this affection, which is by no means rare, should have been so little noticed by authors, or so little pains taken to prevent it, since, I am well convinced, it follows, not as a necessary and unavoidable consequence of the operation itself, but from the injudicious manner in which it is usually performed.

I have invariably noticed, that when the nerve of a tooth has been wounded, lacerated or only partially destroyed, or if a portion of it has been left at the extremity of the stump, after drilling, that much pain, and generally very severe and extensive inflammatory affections have followed; and I think that attention to this circumstance, especially where it is designed to secure an artificial tooth to a stump, after its nerve has been drilled out, is a very important point, and one of more consequence than is generally supposed.

At the commencement of my practise as a Dentist, there was no operation that I more dreaded to perform, than to destroy

the nerve of a stump, for independent of the immediate suffering, I confess that hardly a case of this kind occurred to me, which was not followed by extensive inflammation of the gums, cheek, and face, extending to the membrane of the fangs and to the alveoli, and in or two cases termination in suppuration, ulceration and eventually the protrusion of the stump. These cases, even when mild, were generally of so intractable a character, that there was no course of treatment which I could devise, whether constitutional, or local, that seemed to have the smallest effect, either to prevent their recurrence, or abate their violence.

Aware of these distressing consequences, I have occasionally declined operating in these cases, recommending the patient, though contrary to their wishes, to wait, until by the gradual process of decay, the sensibility of the nerve should become impaired; and it was not until after a very careful examination of the manner in which I was in the habit of destroying the nerve, that I became perfectly convinced, that it was to this circumstance alone, that all the subsequent ill effects were to be referred.

In conformity with this opinion, in every case of the kind which has fallen under my observation since, I have invariably removed the artificial tooth, re-drilled the stump with great caution, observing to leave in it, no portion, either of the nerve or membrane of the cavity, wiped away all the small pieces of bone, which might have remained after the operation of drilling, and replaced the tooth; and in every instance, where these pains have been taken to destroy the nerve and membrane entirely, before securing the tooth to the stump, as well as in those cases, where this has been done after the tooth has been secured, and before the inflammatory symptoms have become extensive, the success of this practise has been unequivocal. I think farther that I am warranted in asserting, that whenever these painful affections take place after securing an artificial tooth to a stump, the nerve of which it has been necessary to destroy, they will generally be found to follow, in consequence of the irritation arising from a portion of the nerve attached to, and remaining in the cavity of the stump that has not been destroyed by the operation of drilling, and which is in a state of compression by the means used to secure the artificial tooth.

The effect produced by the compression of the nerve in this case, seems to be analogous to what takes place in every part of the body under similar circumstances; for, the partial division, laceration, or wounding of a nerve is infinitely more likely to be followed by unpleasant consequences, than if it is

completely divided, or a portion of it entirely destroyed. Of this fact we occasionally have an example, in the local and constitutional irritation, arising in consequence of the wound of a small nerve in the operation of venesection. The analogy holds likewise with regard to the treatment; for in both cases, the only remedy to be depended on, and the one, which in the injury of the nerve in venesection, is usually practised, is in effect the same, i. e. either the complete division, or destruction of the nerve.

It should be observed, that even when the nerve is drilled out with the utmost caution, a slight swelling of the gum will sometimes take place after setting an artificial tooth, arising probably from the irritation produced by filing down the stump, this also frequently happens where the nerve has been dead for a long time, but in these cases, the inflammation is slight, unattended with pain, and never giving rise to those severe and obstinate affections which so generally succeed the incomplete destruction of the nerve.

Application is frequently made to the Dentist, to extract a tooth that is perfectly sound, and which has become painful. As there are a variety of causes independent of caries, capable of exciting painful sensations in a tooth, it is of no small importance to be able to discriminate them, or order to adapt our practise, in these cases, to their removal, in preference to the removal of the tooth, which in many instances, so far from affording relief, aggravates the disease, and should never be adopted in any case, unless there is every reasonable prospect that it is the only effective remedy.

An inflammatory affection of the membrane of the fang, is a much more frequent cause of pain in a tooth, than has been generally imagined, this sometimes takes place in teeth that are perfectly sound, as well as in those that are decayed, the pain may proceed from inflammation of the membrane, and not from the irritation of caries, and cease immediately on the removal of the inflammation.

When we reflect on the additional suffering occasioned by extraction under these circumstances, and the advantages sometimes resulting from the preservation of a tooth, even when partially decayed, it cannot be considered unimportant to attempt it, as it may easily be effected in almost every case, before, and not unfrequently, after suppuration has taken place. It is sometimes more difficult to satisfy ourselves as to the nature of a disease than it is to adapt remedies to it when known; the most successful method with which I am acquainted, by which we can ascertain whether the pain of a tooth proceeds

from the inflamed state of the membrane of its fang, and one which I have practised for some time, is, by percussion; by simply striking a tooth in this state with a steel rod, a very singular, and painful sensation is felt, not only in the tooth itself, but in the jaw, seeming as if the tooth when struck was much larger, and extended deeper into the jaw than any of the other sound teeth, upon which if we make the same experiment, but little or no sensation is produced.

The same effect is found to follow from pressing the steel rod firmly against the tooth and making with it at the same time, a slight motion from side to side.

In a tooth that is decayed, it is very easy to determine whether the pain proceeds from the caries, by the acute sensation which is produced on passing a probe into it, a practice that ought to be adopted in those cases in which we have any doubt as to the nature of the disease, since, we may generally conclude that if no sensation is produced by this mode of examination, there is but little probability, that the pain proceeds from the carious state of the tooth. It sometimes happens, where the pain of a defective tooth evidently arises from its carious state, that percussion will produce a painful sensation, but this usually takes place where the pain has been very severe and protracted, a case, which generally admits of no relief but the extraction of the tooth. Whether the pain produced by percussion arises, simply from the carious state of the tooth, or whether it follows from the inflamed state of the membrane, which so frequently takes place in these cases from the irritation of the caries, I am not prepared to say. Painful affections of the teeth frequently take place from the operation of a variety of other causes, besides those already referred to, but as a consideration of the diseases of the teeth is no part of my present object, I shall not now advert to them.

The loss of a tooth may perhaps appear to be of but little consequence, and very frequently this is the case, but under certain circumstances, the preservation of a tooth is a matter of such importance, that I think it always advisable to attempt it, whenever there is a reasonable chance of success, and the wishes of the patient are in favour of the experiment. The immediate extraction of every tooth that has become painful, is an operation too generally resorted to, and I have known so many instances, where tooth after tooth has been sacrificed without affording any relief, that I now never advise it, except in those cases, where it appears to be indispensably necessary.