

## CHAPTER VII.

### ANOMALIES OF SECOND DENTITION AND THEIR SURGICAL RELATIONS.

UNDERSTANDING and appreciating the characteristics and relations of a normal dentition, we are prepared to pass to the consideration of abnormal, or pathological, conditions. Such conditions may be justly grouped under the head of anomalies.

Anomalies in second dentition are classifiable under seven heads:

- 1st. Teeth common to the age, but erupting external or internal to the arch.
- 2d. Teeth denied space in the arch, because of natural or surgical interference with the process of maxillary enlargement.
- 3d. Germs developing in positions where their product must remain encysted.
- 4th. The production of supernumerary teeth.
- 5th. Third dentitions.
- 6th. Teeth the periodontium of whose fangs associate with the periosteum of the maxillary sinus.
- 7th. Germs with heterogeneous development.

These seven conditions, then, because they differ from a just, or normal, dental evolution, we call anomalies.

**ANOMALY FIRST.**—A tooth external or internal to the alveolar arch not infrequently gives origin to an ulcer or locates epithelioma. Yet close as is this primary to the secondary lesion, and evident as such relationship would seem to be, the writer has known ulcers of the tongue, lips, and cheeks treated for months—of course, without success—where it has never seemed to strike the practitioner that a tooth could have any association with the disease; indeed, in one case, where the patient was remotely connected with himself, death was the result of cancer located in the cheek from this very anomaly. Many cases of like character are familiar to the experiences of every surgeon.

*Note.*—Even where there is excess of room, the permanent teeth not infrequently erupt irregularly; indeed, this applies so directly to the inferior incisors, that it may almost be said to be the rule rather than the exception. Unless, however, specially indicated, it is the best practice to leave such teeth to nature; they will almost always be found to come right of themselves. Such eruptions are to be classed with the anomalies only as derangement is marked and permanent.

**ANOMALY SECOND.**—*Teeth denied space in the arch.* This anomaly has perhaps the largest associative pathological connection.

It is to be remarked that this lesion, if we may term it such, is more frequently the fault of the surgeon than of nature. If, for one moment, we refer to the physiological relations existing between the first and second dentures, we may find that it is within our power to prevent the many ills that follow so frequently in this train, and this simply by doing little, or, more commonly, nothing.

The deciduous dental arch is filled, as we are all aware, completely by its ten teeth. The second, or permanent, set is to comprise in number sixteen, and each tooth certainly quite as large again as its predecessor. This increase in number and size of the teeth, it is evident, must be provided for in an enlargement of the alveolar arch. This provision is always attempted by nature in the process described by the physiologist as the elongatory.

This process of maxillary enlargement is to be illustrated by considering the ten milk-teeth as so many wedges placed in a springy arch. This arch it is designed to lengthen by additions to either end. If, now, these wedges should be removed before others were ready to take their place, it is evident that the elongation, being made at the ends, would, to a greater or less extent, be counterbalanced by the springing together of the parts at the sites of the removed wedges. The process of maxillary, or rather alveolar, absorption, is truly represented by this retraction of an arch. In proportion to the number of deciduous teeth removed prematurely, will be the curtailment in size of the arch; at least of its alveolar face.

Let us, then, look at the results of such abridgment,—approximal caries of the teeth, periodontal troubles, trismus, odontocoele, necrosis, the violent inflammations attendant on the development of the *dentes sapientiæ*, etc.

*Note.*—If there be a pathological Pandora's box, it is certainly the lesion of an overcrowded maxillary arch.

The condition of overcrowding is made evident to a practitioner the moment he looks into the mouth of his patient: the teeth are jammed into the most uncomfortable-looking positions; the deformity, however, mostly existing in the front of the mouth,—either the central incisors override, or the laterals are thrown back, or otherwise the cuspidati take a tusk position, standing out prominently from the arch, the bicuspidati occupying too anterior a location, approximating, indeed, not infrequently with the lateral incisors.

*Treatment.*—To abort the ill consequences of such a contracted arch, extract at as early a period as possible the first bicuspidatus of either side. This very simple operation will frequently not only secure against secondary lesions, but will occasionally correct the most annoying deformities. Let it be remembered, however, by the practitioner who prefers prophylactic to operative surgery, that on his treatment of the deciduous mouth depends, in a measure, the health and comfort of the adult.

If the question be asked, What is to be done with the deciduous aching

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tooth? it is to be answered by saying that the cavity exposing the pulp should have been filled on appearance of the decay. This is a matter which no parent can afford ever to neglect. In the armamentum of the oral surgeon are plastic materials, easy and painless of introduction, which are to be depended on to accomplish the services required of them.

Equal parts of chloroform and tincture of aconite, applied to an aching nerve on a delicate pellet of cotton, will sometimes instantaneously relieve this form of toothache. Another admirable application, used in the same way, is the atropiæ sulphas, dissolved in water, in the proportion of one grain to the ounce. Still another, a means in universal use, is creasote. Other remedies are found in oil of cloves, in Goulard's extract, tincture of iodine, bis-muthi subnitras in saturation, chloral hydrate, and tincture of ergot.

An exposed pulp in the deciduous tooth is, however, so constantly subject to irritation, that every indication calls for its destruction. The necessity is unfortunate, but the demands are persistent, and the removal of the part seems the lesser of two evils between which the practitioner is compelled to choose. The application of arsenic, however, to such an exposed pulp has come to strike the experienced as questionable, and, as it is not a necessity, it will be found best perhaps to restrict the use of this agent to the permanent teeth. A deciduous pulp is to be destroyed by touching it a few times with a fully saturated tincture of iodine, or with either of the Monsel's solutions of iron. (See chapter on *Odontalgia*.) Arsenical applications are, however, frequently employed, but unless a practitioner be conversant with the physiological change that occurs in the fangs of these teeth, he had better not risk this means; if, however, he feel prepared to employ such an escharotic, he can use no better formula than the following:

R.—Acidi arseniosi,  
Morphiæ acetatis, ãã gr. x;  
• Creasoti, q. s. to make a thick paste.

This is a paste quite universally employed for destroying the pulps of adult teeth. To apply it to a milk-tooth, take a piece not larger than a pin's head, and, dropping it lightly into the cavity, cover loosely with cotton; the part is to be washed out with warm water after four or five hours; it is not well to leave such a preparation in a deciduous tooth over five hours; if absorption of the fang had advanced to any extent, even one might be too long. Employ it fearlessly in the adult mouth, only remembering that you deal with arsenic; but with the child too much caution is not to be exercised.

The central incisors of the deciduous set of teeth should (a normal life continuing) last until the seventh year; the laterals until the eighth; the first deciduous molar until the ninth year; the second until the tenth; the deciduous cuspis until the eleventh; and let it be remembered that the most posterior molar teeth that are in the mouth at the sixth year are the first permanent molars, and that these teeth get their place in the jaw without displacing any of the deciduous.

For an account of some of these secondary lesions, together with treatment, see future pages.

**ANOMALY THIRD.**—This anomaly is remarked by examination of the classes of teeth erupted. Teeth all erupt in pairs, so that one is not likely to be deceived. The anomaly is not infrequently the result of interference with the development of the germ of the permanent through non-absorption of the root or roots of the deciduous teeth.

*Example.*—A deciduous central incisor erupts—as a rule—about the seventh month, and is succeeded by the permanent at the seventh year. Now the physiological relation existing between the two teeth is as follows. At the time when the deciduous has attained its full development the germ of the permanent is at its apex. (See Fig. 55.) Retrograde metamorphosis now commences in the fang of the deciduous, while, in an inverse ratio, the development of the permanent advances. It sometimes happens, however, that no process is set up for the taking away of the deciduous fangs, and, as a consequence, the crowns of the permanent are compelled to make places for themselves; this they generally do by emerging posterior to the deciduous; but, as can readily be imagined, ontocele, or encystment, is not infrequently a result.

*Note.*—Sometimes, long after the period at which second dentition is usually completed, the incisors, as would seem to be natural, are to be remarked, each occupying its respective alveolus. Yet here we may have ontocele. One of the teeth that we see belongs to the milk set. This anomaly could, however, deceive only the very superficial observer, the difference in the classes of teeth being sufficiently marked.

Because of this non-absorption of deciduous fangs, arrest in the development of the permanent occasionally is met with. It is really quite a nice point in practice to give advice in such cases; if extraction of the deciduous tooth be advised, and no other come to replace it, the practitioner will be sure to get a good deal more censure than he could possibly deem himself deserving. There are a number of conditions to take into consideration in such a case, the most prominent of which is the existence or non-existence of the anomaly in a hereditary point of view. The author is acquainted with a family where continued integrity on the part of certain front deciduous teeth, conjoined with the non-appearance of the permanent, has been a striking peculiarity as far back as the ancestors can be remembered. Ability to advise, in such cases, can only be gained by careful study of the laws of dentition and idiosyncrasies.

*Surgical Relations.*—In an examination of any obscure tumor of the maxillary bones, examine the dental arch; if a deciduous tooth occupy the place of a permanent, or the permanent be lacking, not having been extracted, the existence of ontocele is reasonably to be inferred.

**ANOMALY FOURTH.**—*Supernumerary Teeth.*—These teeth differ from all others in being doubly fully conoidal; this as a rule. It is, however, to be



remembered that exceptions are met with. Harris mentions having seen teeth of this kind so resembling normal organs as "to make it impossible to distinguish which should be called the supernumerary;" few observers, however, have met with such decided exceptions.

An encysted condition of these bodies obscures very much a recognition of their existence. In diagnosing diseases of the mouth, we are to bear in mind that there are such odontocetes. The study of the evolution of these teeth is very interesting, but, of course, concerns the physiological rather than the surgical writer. The place where they are met with is the roof of the mouth.

*Surgical Relations.*—With the exception of the relation of supernumerary teeth to tumors, we have only to deal with them as they so strangely present themselves in the mouth. An example in this direction of practice may be given. A patient presents himself and tells you that there is a piece of bone working out through his mouth; and, truly, an examination will seem to verify his assertion. But there is one point which, if observed, will save the practitioner from being misled. Necrosis is always preceded by, and is associated with, tumidity of the gum. The eruption of a supernumerary tooth is very gradual, and, so far as the writer's experience goes, is never associated with inflammation. To extract such teeth, wait until they have emerged to the base of the cone; or, if such waiting do not seem desirable, carefully force sharp-bladed forceps through the bone until the nibs grasp this base, then with a rotary motion they are easily to be pulled away. Their alveoli need no attention.

*ANOMALY FIFTH.—Third Dentitions.*—We are not to be understood as referring here to that extra development sometimes occurring in young adult life, and yet the mention of the existence of such an anomaly is, perhaps, desirable. Thus, Columbus reports that one of his children had three rows of teeth. Valerius Maximus and Pliny relate similar facts. A son of Mithridates is said to have had two, and Hercules three. The author has seldom seen this anomaly, and inclines to think that its existence, in these modern times, is not coextensive with the ancient period. He certainly has had quite five hundred persons tell him that such and such tooth or teeth were the third of the class, but examination, in almost every individual case, has satisfied him of a mistake; this anomaly has, however, surgically, little or no signification.

Third dentitions, as here referred to, are those which are associated with advanced age. The student will recognize their physiology when they are classified with second sight, etc. The lesions of this anomaly are what might be termed associative,—that is, we are occasionally so deceived by them as to be led falsely to interpret engorgements, congestions, etc.

A single case will illustrate the anomaly. An individual, aged sixty-five, applied to Dr. Chapin Harris, suffering with pain in the gums and jaw. No local lesion was discoverable. A tentative treatment was resorted to. The apparent disease went on, entirely uninfluenced by the experimental medication, until at last it attained an intensity positively excruciating. In twenty-

one days the mystery was explained by the eruption of a third set of teeth. The report of another case is, at the time of this writing, appearing on the pages of various journals describing a new and full dentition in the person of a gentleman eighty years of age.

*ANOMALY SIXTH.—Association of the odonto-periosteum with the membrane of the antrum of Highmore.*

It will be remembered that the easiest entrance to the maxillary sinus is through the palatine fang either of the second or the first molar tooth. It is, indeed, a very common thing to find the roots of these teeth perforating the cavity. Remembering this association of parts, it will be seen that many conditions, which may have been deemed obscure, are thus made very plain. Dr. Harris, who seemed a close observer in diseases of the mouth, went so far as to say that two cases, mentioned by Bell and Bordenave, were the only authenticated exceptions where abscess had formed in this cavity at any other point than that at which it had been penetrated by the root of a tooth.

A case mentioned in Braithwaite, from the practice of a Mr. Louis Oxley, of London, illustrates most happily the relations of this lesion. A young woman, of rather strumous habit, complained of a dull, aching pain under the orbit. The pain lasted from three to four months, attended by a gradual elevation of the orbital surface of the maxilla. The eye above this surface became at length so affected as entirely to lose its functions. At this stage of the case she was directed to use leeches and blisters behind the ears, and to employ drastic purges. After three months' blindness, the patient first perceived a discharge, from the right nasal fossa, of a thick, purulent fluid. This discharge had existed, he says, eighteen months, when he first saw the case. An examination of the mouth at once revealed the cause of so much misery; the removal of three roots, in a state of periodontitis, was the simple means by which two most important organs regained their proper functions.

The nasal opening of the maxillary sinus, it is known, is, in a healthy condition, almost closed by the duplicature of membrane lining the turbinated and neighboring bones; congestion of this membrane not infrequently closes the outlet entirely. Thus secretions accumulate, giving alarming and threatening disfigurements to the face. The weakest points in the osseous boundaries of this cavity are, the floor of the orbit, the hard palate, the tuberosity of the bone, and the canine fossa. Any accumulation would necessarily be apt to vent itself at one of these four points, unless atresia of the duplicated membrane alluded to should occur, and which is not commonly the case.

*Note.*—The author's experience regarding acute abscess of the antrum is, that in the great majority of cases the pus seeks to vent itself through the floor of the cavity. After the inflammatory action has passed to the suppurative stage, a swelling will be noticed in the roof of the mouth at the side of the mesial line, corresponding to the diseased sinus: this is the abscess pointing, and, if left to itself, is sure to make an ugly opening. Such a result will be found particularly undesirable if there be any specific virus



lingering in the system. But, wherever this abscess should tend to point, it is of course desirable to abort it.

If the assertion of Harris be true, concerning the almost invariable dental origin of the trouble (and certainly experience confirms him), we turn naturally to the alveolar arch, seeking there the source of offence and defence. For a single moment, then, let attention be directed to a few dental lesions of a most practical character, without the ability to recognize which, the practitioner will assuredly find himself at sea.

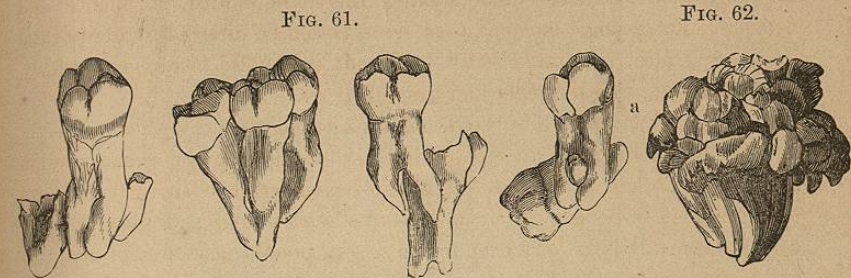
Because, when turning to the dental arch, we find it entirely clear of teeth, and healthy-looking, we are not hastily to conclude that the primary lesion lies in some other direction. We are to remember that fangs of teeth are not infrequently broken off in an attempted extraction, and that when so broken, particularly if very deep in the socket, practitioners are not unapt to leave the pieces. Now, it is easy to understand that a fang so situated may be the source of extensive disease, and yet the gum over it be without break in its continuity, and perfectly healthy-looking. The relation, in such a case, of the fang, is with the antrum,—it need necessarily have no external sinus. Here an explorative incision along the gum down to the bone is to be made. If, happily, we come to a cavity, we will have hit on the origin of the trouble; if nothing be found, we have made but a simple incised wound, which left to itself heals in a few hours.

Again, because the part may have its complement of teeth, and each tooth seem perfectly healthy, we are not to turn hastily away. There may be in one of these teeth a dead pulp. To satisfy ourselves on this point, we take up a delicate steel instrument, and strike with it each tooth separately, directing the patient to note any difference in the sensations; if he start when a particular tooth is struck, we have found the primary lesion. But still again the lesion may be here, and yet the patient not express the anticipated pain. A hand-mirror is now taken, and, placing the patient full in the sunlight, rays are to be reflected over the teeth, by placing the glass back of them. If in the arch there be a dead tooth, an opacity not belonging to its neighbors will show itself; this is the offence; remove it.

If a tooth have a plug of metal in it, take the filling out: the cavity will, not unlikely, be found to communicate with the pulp-chamber.

**ANOMALY SEVENTH.—Germ of heterogeneous development.**—It occasionally happens that the dental germ, instead of arranging its parts according to the ordinary manner, assumes the most fantastic and heterogeneous complexion, giving, indeed, such heterologousness of appearance that nothing but the microscope can at times discover its true character. Out of this condition arise tumors, caries, necrosis, and other derangements. Fig. 61 shows the most simple expression of heterogeneous development. The fusing of teeth after the manner here exhibited is so common as to be very familiar. Every variety has been met with from time to time. No confusion exists, however, as recognition of tooth character is concerned.

Fig. 62 is a marked departure from simple fusion. At the point *b* ordinary tooth roots are recognizable. At the summit of the mass, *a*, the appearance is cauliflower-like.



Figs. 63 and 64 are other illustrations of heterogeneous development.

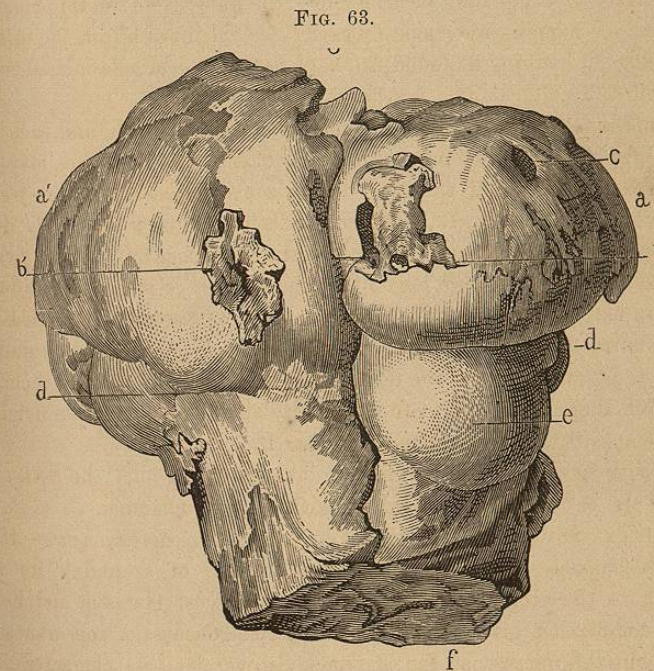


Fig. 63.—*a, a*, second grinding tooth of a horse, natural size, with considerable development of the roots, transformed into two spheroidal swellings. *b, b*, portions of the maxillary bone sheathed in the tumor, and broken in its extraction. *c*, orifice conducting to the interior of an intradental cavity. *d, d*, circular groove corresponding to the alveolar arch, and forming a sort of strangulation between the tuberosity *a* and the swelling *e*, which is underneath. *f*, inferior surface of the crown of the tooth.



FIG. 64.

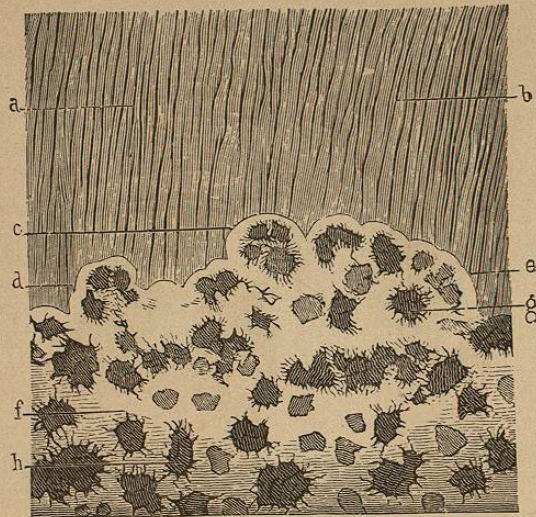


FIG. 64.—Microscopic examination of the tumor (300 diameters).—Represents part of a thin section of the tumor shown in Fig. 63. The tumor was formed jointly by a hypertrophy of the dental ivory and a hypertrophy or exostosis of the cement, the greatest part being formed of the substance of the cement. *a, b*, represents the ivory in its canaliculi—not ramified in this section—and terminating near the union of the ivory and enamel. *c, d, e*, exhibits the mammillated arrangement seen in the cement at certain points of the surface of union with the ivory or dentine. This arrangement, often very elegant under the microscope, is also met with in the normal teeth. *g, h*, osteoplasts, or characteristic cavities of the cement. They are especially remarkable for their size in all the preparations taken from this piece. *f*, proper substance of the cement, or bone, in which the characteristic cavities are excavated. It is here, as always, homogeneous; little transparent, except when it is reduced to very thin laminae.

Figs. 65 and 66 afford further illustration.

FIG. 65.

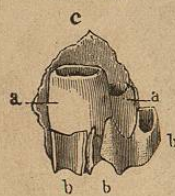


FIG. 65.—Intra-maxillary bone bearing the two permanent incisors (*a, a*) superposed, and exhibiting an anomalous development. The alveoli of the same infantile teeth are partly destroyed; this section formed the deposit.

FIG. 66.

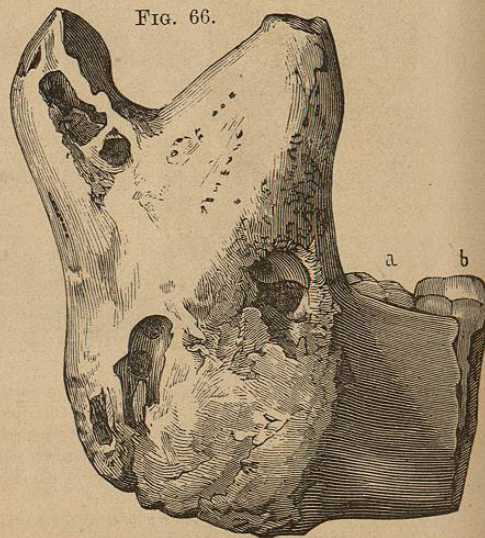


FIG. 66.—Tumor of the ramus of the inferior maxillary bone, affected with mollities ossium. At the surface are many openings of encysted abscesses; and the last molar, the crown of which extends slightly beyond the alveolar edges, and is developed in the thick part of the base of the coronoid apophysis.

Figs. 67, 68, and 69, after Forget, furnish still other examples.

FIG. 67.

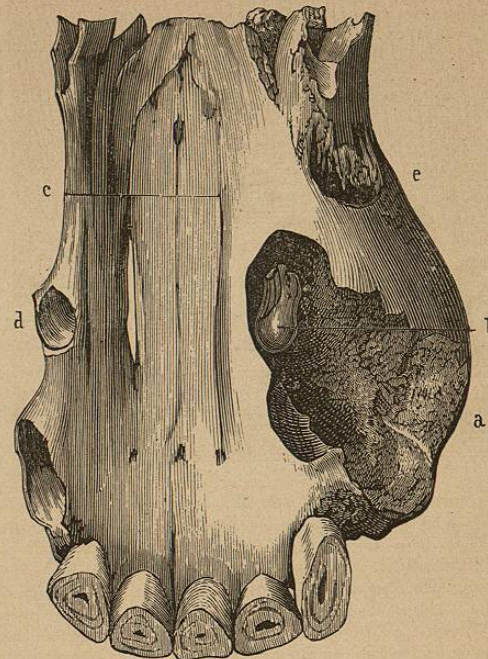


FIG. 68.



FIG. 69.

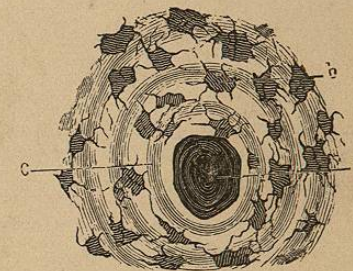


FIG. 67.—Upper jaw of a horse; view of half of the palatine face. *a*, osseous cyst developed in the interior and right side of the jaw; it includes the tumor represented in Fig. 68. *b*, right canine, thrust backward and inward toward the mediopalatine line. *d*, alveolus of the left canine tooth. *e*, osseous perforation, conducting to the interior of the cyst.

FIG. 68.—Intermaxillary osseous tumor (natural size); it was contained in the cyst represented in Fig. 67.

FIG. 69 (300 diameters).—Represents a part of the section of the tumor shown in Fig. 68. This tumor appears to be formed entirely of the cement or osseous substance surrounding the



dental root. It is an exostosis of the dental cement. *a*, vascular canaliculi of the osseous substance of the tumor (Havers' glands). The tumor is traversed by these as in the normal osseous substance,—only they are more rare, more scattered, and more irregularly distributed. *b*, osteoplasts disposed circularly, or nearly so, in a concentric manner around the Haversian canal, but less exact and evident than in the normal condition. *c*, the osseous substance, properly so called, in which the osteoplasts, or characteristic cavities of the osseous tissue, are excavated.

For further illustration, see *Odontomata*.

## CHAPTER VIII.

## THE TEETH AND THEIR DISEASES.

## CARIES.

CARIES of the teeth being a disease so destructive to comfort and to health, and withal so common as to possess its illustration in almost every human mouth, makes the subject felt as one claiming earnest investigation and attention.

Caries of a tooth, most simply expressed, is corrosion of its substance: the disease may occur on any part of the surface of the crown or even on the root, but as a rule is found to originate on parts possessed of the least self-cleansing characteristics. Thus, it is most common to the sulci on the grinding faces of the molars and bicuspidati, to the posterior depressions met with so frequently in the superior incisor teeth, and to approximal faces of the teeth generally.

Caries is a disease of chemico-vital relation, and is unfortunately most markedly of congenital association and predisposition: indeed, so true is this latter, that it is to be prognosed that the offspring of parents afflicted in this way will be in like manner affected, and that, on the other hand, the children of parents possessing good teeth will be in like manner favored. So constant is an analogy in the teeth of parents and child, that in most instances it extends to the very shape and arrangement of the organs, deformity insuring deformity, regularity regularity. One parent alone may influence for good or for evil.

Hereditary dental caries finds its explanation in likeness of condition, this being of local or constitutional signification, or more commonly a conjoining of these; such teeth being not only imperfect in development in one or more directions,—in shape, in deficiency of enamel-covering, in non-calcification as exhibited in the existence of interglobular spaces, in position, in tubular circulation, in nerve endowment,—but in an equal number of cases in lack of physiological harmony, either in surrounding secretions or in the offices of nutrition: any or all of these may be the conditions, as indeed, resultant from them are all cases of caries.

Health in the dental organism depends:

1. On circumstances associated with the original formation.
2. On the shape of the teeth, their relation to each other, and their self-cleansing features.
3. On constitutional conditions.

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