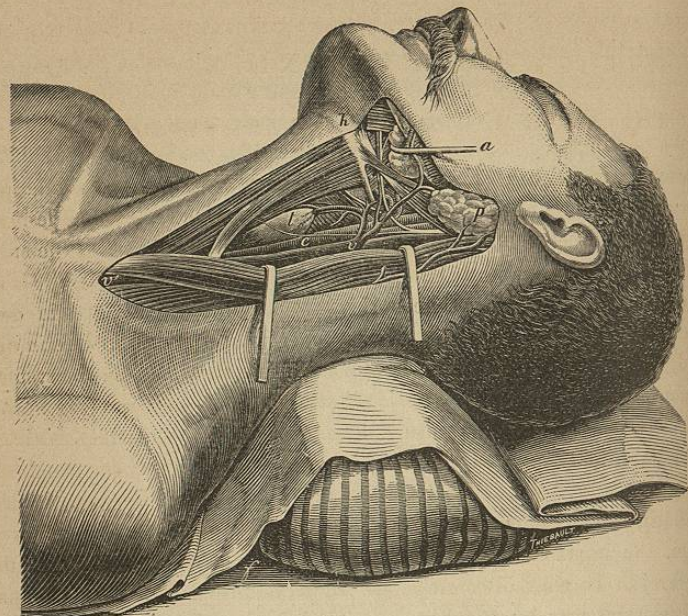


part as a square, the boundaries of which are the mesial line in front, the trapezius muscle behind, the base of the jaw above, and the line of the

FIG. 498.



V, internal jugular vein with its tributaries, the facial, the lingual, and pharyngeal; p, parotid gland; h, os hyoides to which is attached the stylo-hyoid muscle, through which is seen running the tendon of the digastric, under which passes the hypoglossal nerve after crossing the external carotid; a, hook raising the submaxillary gland in order to expose contiguous parts.

clavicle below. This square is divided into two great triangles, known respectively as the anterior and posterior cervical, the separation being the sterno-cleido-mastoid muscle. These triangles are subdivided by the passage of another muscle, the omo-hyoid, into four, namely, anterior superior and inferior, and posterior superior and inferior cervical triangles. Desiring to inform himself as to a special operation, or as to detail, the practitioner isolates the particular triangle and makes his study, or diagrams, without reference to any other part.

## CHAPTER XLIX.

## THE ANTRUM OF HIGHMORE AND ITS DISEASES.

MANY years spent in a practice which should have afforded every opportunity for observation, as well as a scope of view which necessarily offers to one who is himself a hospital surgeon and a frequent visitor at hospitals, combine to impress the writer with the truthfulness and propriety of a conclusion, that the immediate diseases of the antrum are, for the most part, simple in character, easy of diagnosis, and, as a rule, not at all difficult of treatment. Indeed, for the purpose of general study, one would not be entirely without justification in asserting that there are but two sources of trouble to be found in this cavity: the first, and prominent, being lesions secondary to the diseases of the teeth; the second, the lesions common to mucous membranes, wherever situated. Certain it is that the great majority emanate from the first of these directions; while the atonic conditions, represented by the dropsies, the puruloid secretions, the mucous engorgements, and the ulcerations, are in no wise different from ordinary mucoid affections, except as modifications are made by situation; the last being conclusively proven by the fact that what is the cure of the one is the cure of the other.

While accepting, however, that in these two directions lie the chief sources of trouble, it is not by any means to be understood that the subject is unworthy investigation outside of such considerations; on the contrary, there is found recorded more than one description of diseases of the cavity, which, to the author, at least, are as anomalous on principle as they are in description, and which he can only explain to himself on the ungenerous supposition that the authors have drawn on their descriptive powers, or else that the antrum has some strange anomalies.

Again, as a class coming between these uncommon and the common affections, it follows, not at all indirectly, that there exist sequelæ of certain of the exanthemata which have a special and peculiar affinity for this cavity; while, in syphilis, it may be the case that the very first event in the secondary train exhibits itself in a disturbance of the sinus. That this latter, however, is rare, observation certifies. Indeed, syphilitic troubles of the antrum are so infrequent even in the tertiary stage of that affection, that experience will lead to the inference that the cavity never takes on the disease unless when, from continuity of structure, it has the trouble absolutely forced on it, this either from its relationship with the hard palate in the oral direction, or with the turbinated bones in a nasal; for, while the practitioner will surely hear

complaints, yet, if he investigate the cause of trouble, he will find that mercurial inflammation of periodontal membranes is the source of offence, rather than the specific condition. Clumsily performed surgical operations are also occasional causes of morbid conditions being set up in the cavity, which, when forerunning, would of course be so evident as to force the consideration of them on the attention,—the most common of them being the breaking of the fangs of teeth in attempts to extract these organs. (See *Tumors*.)

With these preliminary remarks, we pass to a consideration of the premised principal cause of antral trouble,—diseased teeth.

In the chapter treating on "Anomalies of Dentition," attention was directed to the close relationship of the fangs of several of the teeth with the floor of the antrum, and to the fact that it was not uncommon to find these fangs—particularly the palatine of the second molar—penetrating the sinus, thus associating their membranes, and furnishing a contiguity, if not a continuity of structure.

In the same chapter attention was also called to such diseases and conditions of the alveolar border as are apt secondarily to affect the antrum; means of diagnosis and treatment being suggested. The reader who feels sufficient interest in the subject will do well to review the chapter alluded to before proceeding to the consideration of the clinical cases here presented. (See, also, chapter on *Tumors*.)

CASE I. *Indolent Tumor on the Right Cheek*.—A woman had an indolent tumor on the right cheek, about the size of a pigeon's egg, occasioning much disfigurement, but altering the color of the skin very slightly. The patient had often suffered violent toothache on this side, and, though young, had few teeth now remaining, and these all carious; otherwise she was in very good health. The tumor was prominent toward the cheek, palate, and nostril, yielded on pressure, and gave a slight noise as it returned to its position.

The symptoms caused the practitioner to suspect the existence of some fluid, which it was necessary to evacuate and follow with suitable injections. For this purpose, the cheek was drawn aside, and an incision made into the bone above the gum, with a bistoury, enlarging it before and backward, till a sufficient opening was obtained, from which escaped an inodorous mucous fluid. The bone was at no point denuded of its periosteum. The wound was dressed with a pledget of lint saturated with spirits of wine, and the next day the patient was better. On the third day she was feverish, the sinus was swollen and painful, and the discharge acrid and fetid. These symptoms were controlled by proper remedies, and, after twenty-four days, the walls of the sinus were nearly restored to their normal condition.

The canine tooth of this side being very obliquely situated, it was thought proper to extract it, and thereupon followed an escape, through its socket, of fluid contained in the sinus, though the tooth itself seemed perfectly sound. Through this orifice injections were made. The opening made in the exter-

nal wall healed promptly, without any exfoliation; in six months the tumor entirely disappeared, and the patient was cured. (From Baron Haller's Collection of Medico-Chirurgical Theses.)

The translator of the above case, in commenting upon the treatment, pointedly remarks, "One cannot fail to see the uncertainty, not to say obscurity, of the treatment adopted. Though all the teeth were carious, and their extraction plainly indicated, an incision in the external wall of the antrum, or, more correctly, its destruction, was determined on. The result is seen in the symptoms which supervened on the third day, which were, perhaps, hastened by the spirits of wine. We have here a canine tooth quite displaced and involved in the tumor; yet it was long before the idea of its extraction occurred, though the subsequent discharge, through its socket, proved how advisable it would have been at the commencement of the treatment. In this way the time of cure might have been shortened by half."

CASE II. *Distention with Softening of the External Walls of the Sinus*.—In —, says the same surgeon, I was consulted in the case of a large tumor of the right cheek. The external wall was much distended and softened, and yielded to pressure, upon the removal of which it gave a sound resembling the crushing of an egg-shell. The nose was turned to one side, —the nostril was obstructed,—yet the patient suffered no pain, and the skin, though distended, preserved its natural color. On examination of the mouth, I found that the crowns of the bicuspidati and molars were destroyed by caries, which induced me to advise the extraction of their persistent fangs; the patient consenting, this was immediately done. The shock occasioned by the removal of each of the fangs, caused a portion of fluid to escape from the sinus through the natural opening: it was thin, reddish, saline, and inodorous, and, in all, about three spoonfuls. The tumor could now be made to disappear by pressure, but would again return to its full size. Pressure caused no escape of fluid through the nasal, and but slight through the alveolar, opening, which latter was at the bottom of the first molar socket, and large enough to admit the finger.

The internal membrane of the sinus was entire, except at the alveolar opening: through this I made injections of warm water, strengthened with a little gently alterative fluid. The next day I injected the sinus repeatedly with a decoction of agrimony\* and honey of roses, meanwhile not neglecting external compression. In fifteen days the parts returned to their natural condition, all crepitation of the bone ceased, and the discharge was very slight. I now had recourse to stimulating solutions. On the second day the discharge had ceased, and the alveolar opening was reduced to a mere fissure, and in a month from the extraction of the teeth the patient was fully restored.

\* A mild tonic and astringent. An injection of more character would be as follows:

R.—Glycerinæ, ℥j;  
Tincturæ opii camphoratæ, ℥ij;  
Aquæ Coloniz, ℥iv. M.

CASE III. *Periodontal Abscess affecting the Antrum.*—A patient was brought to the author who, for more than three months, had suffered with a tumor, like the last, on the right side. The maxillary cavity was distended to a level with the orbital margin; the nose was turned to one side, and the vault of the palate was remarkably prominent. The treatment pursued consisted in removing the fangs of the first two molars, the crowns having been destroyed by caries, which fangs seemed to be the immediate cause of the disease. Next, the opening at the bottom of one of the sockets was enlarged, and through this there escaped a large quantity of a serous inodorous fluid. Pressure upon the palate and external wall caused this fluid to pass through both the alveolar and the nasal openings: this compression, together with suitable injections, soon terminated the disease.

The teeth on the left side being in bad condition, their removal was urged; but to this the patient would not consent. In three months she came back with a precisely similar swelling of this side, which, having the same cause, was cured in the same manner.

CASE IV. *Abscess of the Antrum caused by a Tooth.*—The following very interesting and instructive case is from the practice of Dr. J. D. White, and was reported for the *Dental Cosmos* by his son, Horace Meredith White, M.D.:

Mr. S., aged twenty years, light complexion, peculiar whiteness of the skin,—a characteristic of the family,—had been complaining for some time of a fetid discharge from the right nostril; of heat, and a sense of tension, in the right superior maxilla.

He applied to his physician, who gave him a wash, with the belief that the parts would speedily return to their normal condition, the practitioner supposing the affection to be merely an increased discharge depending on a slight local hyperæmia, the result, perhaps, of the bad state of the weather at the time. The parts, however, did not recover; the discharge became much more fetid, and evidently was principally composed of unhealthy pus, though it was not as copious as it had been previously; the pain was not severe, but the heat of the parts more elevated, and the sense of tension increased. The patient was irritable and pale; the heat of the body was above the average temperature. This was the condition of the sufferer when he came under the care of Dr. W.

Upon examining the anterior naris, nothing was to be discovered to account for the discharge; the mucous membrane being a little inflamed, but not sufficiently so to explain it. A diseased state of the antrum was suspected, and the mouth was looked at to ascertain if diseased teeth could be the cause. The second molar, upper jaw, right side, was unsound. Part of the crown was decayed away; the bulbous portion of the nerve, and the filaments of the buccal roots, were dead, but that part in the palatine root was living, and occasioned the patient pain. A little arsenical paste was applied to destroy it. No sign of alveolar abscess was present in this or any other tooth. The next

day the nerve in the palatine fang was removed without trouble; a careful inspection was now made, and important information received. On examining the right nostril by means of the speculum, a little pus was seen in the middle meatus. The patient was requested to incline the head toward the left side; he did so, and on looking at the parts again, a large amount of pus was found. This together with the facts stated already, and that there was no other assignable cause of the discharge, was deemed sufficient to establish the diagnosis,—abscess of the antrum, caused probably by the unsound second molar tooth.

Extraction was advised and submitted to. On the removal of the tooth no pus escaped. A probe was introduced into the alveolus previously occupied by one of the buccal roots, and readily passed on into the antrum; matter followed the withdrawal of the instrument.

The cure was completed on general principles.

Dr. White concludes the description of his case by remarking a coincidence which it will not be at all amiss to repeat here,—a coincidence which must have been very alarming to the patient. The gentleman had repeatedly visited a horse belonging to his father, which had a profuse discharge from the nose, thought to be glanders. The date of the horse's malady was prior to that of the patient, and, of course, an inference as to infection was not unnatural.

**Dropsy of the Antrum.**—This, which is only another name for mucous engorgement, is not infrequently the result of a reflected chronic periodontal inflammation. In such cases, we have the analogue of a similar inflammation in the cavity of the mouth: the membrane becomes puffy and thickened, the mucous secretions grow inspissated, and the natural opening of the sinus (simply through this thickening of the mucous membranes, the folds of which are the natural outlet of the cavity) is found obliterated. All egress being closed, the result is not difficult to surmise: if there should not occur atresia of the occluding membranes, and no correct surgical assistance be afforded, there must, of course, result either the gradual attenuation of the weakest portion of the parietes of the cavity, or the setting up of active and severe inflammation. If, on the contrary, the natural outlet has a partial restoration, it is not at all unlikely that a troublesome and, if misunderstood, tedious and unmanageable puruloid discharge will ensue: this being the result of a continuance of the cause of trouble. Recalling illustrative examples from his own practice, the writer remembers particularly the case of a child who, previously to coming under care, had been treated nearly two years for the occasional discharge of muco-purulent matter from the left nostril; the subject was of bad temperament, being a cross of the bilio-lymphatic. This patient was relieved in a single week, the treatment being directed wholly to the dental arch, if a course of salt sheet-baths—continued long after the local cure, and which had been directed in consideration of the relaxed condition of her general system—be excepted.

The relation of temperament and conditions is to be closely considered in connection with diseases of the antrum: it is, of course, far from being every one who is troubled with a bad tooth, the fangs of which penetrate the cavity, who has secondary disease of that cavity as a result. The author has just now under treatment a patient suffering from necrosis of the whole roof of the mouth, the result of a syphilitic cachexia, the exciting cause of the local trouble being an incisor tooth anomalously developed. This tooth, the extreme point of which presented just back of the incisive foramen, had been mistaken by a practitioner for the point of a sequestrum, and, being worked and cut at, periostitis had developed; and when the dead bone, which is the result, is ready to come away, both antra will necessarily be exposed.\*

A purulent condition of the secretions of the antrum is to be viewed as one considers a gonorrhœal discharge; indeed, Mr. Bell, the English author, has, not at all unjustly, referred to the two conditions as being similar, "both diseases," he says, "consisting equally of an altered secretion,—in the one, of the pituitary membrane, and in the other, of the muscular lining of the urethra, which in neither instance possesses any of the characteristics of abscess, though the matter in both is purulent."

Certainly, if we allow for some differences, as influenced by cause and location, the description of the one answers very well for the other. In both there is the same perverted secretion, the same molecular change, the same sthenic and asthenic modifications.

As a gonorrhœal discharge is always preceded by certain inflammatory conditions, and as, after the subsidence of the acute attack, the discharge may long continue profuse, or, on the contrary, may decline to a scarcely perceptible minimum, so, in antral purulency, we have the antecedent inflammation, and may have the profuse or limited secretion.

In antral diseases, however, as is readily to be inferred, very much depends on the nature and associations of the secretion. A profuse discharge, with closure of the orifice of the sinus, must necessarily entail untoward consequences: the walls of the cavity will attenuate until (unless surgically relieved) the weakest point gives way, the rupture being most apt to occur either into the orbit or the mouth. Not infrequently, however, this weakest portion seems to be the canine fossa; the opening has also occurred at the tuberosity. The author's experience leads to the inference that the hard palate is by far the most common point at which such matter seeks egress. The tumor will be seen bulging from one side of the mesial line, the swelling advancing more or less rapidly, until fluctuation becomes distinct. A sign diagnostic of this class of tumors is, that the internal boundary is apt to be quite abrupt, and that it does not pass the line of the mesial division. The establishment of a fistula relieves at once the sense of distention, and, if such sinus has opened in a convenient place, as within the mouth, the patient

\* This proved to be the case. The lost process is now replaced by an obturator.

feels disposed to congratulate himself on having come to a sufficient cure. Unfortunately in the majority of cases, this satisfaction is of short continuance; for, independently of the fact that the disease at once takes on chronicity, making the sufferer an object of disgust to those with whom he is brought into immediate contact,—the fetor of the discharge, under some circumstances, being really unbearable,—the undue retention of the secretion within the cavity is a source of such irritation to the parts that not infrequently the most serious lesions result. In some instances—happily, rare—all the bones of the face are destroyed.

The causes influencing retention of these secretions are twofold: First, an external wound is apt to heal, and to continue impervious until increase of the collection induces sufficient pressure to cause absorption, as in any case of abscess. In the second place, the passage is blocked up by flocculi within the cavity.

Puruloid secretion in the antrum may, from the onset, be of so limited a character that, like secretions in certain of the ovarian cysts, years pass before marked inconvenience results. The writer is acquainted with a case, that of Mr. C., late a merchant of Philadelphia, in whom, after five years of great mental and physical suffering, a disease of the antrum, supposed to be malignant, was found to be nothing but simple muco-puruloid engorgement depending on a dead tooth. In this case the trouble had commenced with a feeling of heaviness and oppression in the body of the jaw; the parts had gradually enlarged until finally there was distention of the cheek to the size of a large fist, the eye being thrown entirely out of position from the rising of the roof of the antrum. Much treatment had been given the case, without the slightest benefit accruing. No attention, however, had been directed to the dental arch,—the teeth, although the patient was sixty years of age, being apparently in the most perfect condition. The result of this case was the diagnosis, on the part of a surgeon to whom he finally applied, of a dead nerve in one of the bicuspid teeth. The organ, although as healthy-looking as any of its fellows, responded to the stroke of an instrument in the manner described in the chapter on alveolar abscess; the tooth was extracted, and in six months the health of the patient was perfectly restored. A circumstance connected with the extraction offers an example of practice of which it is well not to lose sight. The practitioner informed the reciter that he expected to find associated with the tooth-fang a pyogenic membrane, and to have the extraction followed by a gush of pus, in both of which expectations he was disappointed. The fang was clean, and the blood which followed the operation had nothing peculiar about it. Not to be thus balked, a probe was passed up the alveolus of the extracted tooth, which, meeting a resisting yet yielding body, was thrust onward in the direction of the antrum; the withdrawal was followed by profuse discharge. Such a resisting body may be simply flocculi or it may be the mucous membrane proper to the parts: most likely it would be found the latter, for we are to remember that it is not alveolar or

antral abscess with which, in these cases, we are dealing, but simply what might be termed a mucitis, and, of course, a break in the continuity of the membrane is not necessarily to be inferred. The practitioner, in this case, only approximated to the exact condition; he thought, evidently, that the trouble was tooth-abscess discharging itself into the sinus, whereas (while the treatment was perfectly adapted to the requirements) the case was one of simple mucous or muco-puruloid engorgement, the result of reflected irritation.

The diagnosis of mucoid or puruloid engorgement of the antrum is not, as a rule, difficult to make out. At first there is inflammation, and this, as has been suggested, is found most likely to have origin with the teeth. As the trouble advances, the patient begins to complain of a sense of heaviness about the body of the cheek. If the secretion be active, there is much pain, sometimes sharp in character, but more frequently heavy and unbearably dull. In all chronic periodontal inflammation we have this same character of pain, but then it differs from that of engorgement in being confined to the alveolar arch; in this latter trouble the greatest distress is found associated with the floor of the orbit, which, as will be remembered, makes the roof of the antrum. At length, as the secretions accumulate, the parietes of the cavity begin to attenuate and expand. The tumor now forming may be distinguished from others,—first, by the history of the case; second, by dryness of the naris of the affected side, the result of the closure of the orifice of the antrum; third, by the gradual and regular enlargement; fourth, by the non-association of the integuments of the cheek; and, fifth, by a fluctuation which it will finally yield.

To treat successfully such a disease, we have only to search out the source of offence, and, where it is possible, remove it. If this should prove to be a tooth, we may, if necessary, secondarily treat the antrum through the alveolus. Where the offence is thus of strictly local origin, we shall find little more needed than the daily employment of some stimulating application, such as diluted tincture of iodine, zinc-sulphate, or a carbolized solution. Where the acrid character of the retained secretion has provoked degenerating ulcers, the very happiest effects are to be obtained from injections of chloride of zinc: *zinci sulphatis*, ℥j; *aquæ*, ℞j.

If, on the contrary, such bad conditions of the antrum be associated with constitutional causes, it need not be suggested that these are to have a required attention. In these latter cases, where the cure inclines to be tardy, complete relief is to be given a patient locally, by making an opening into the cavity, and keeping it patulous by means of a cotton tent; this, combined with the daily use of such injections as may seem indicated, yields great satisfaction.

In parenthesis, it is here to be remarked that the antrum once opened in the floor region, absolute closure is not to be expected; this certainly as the rule; neither, in the experience of the writer, is closure of consequence, no

harm resulting from the opening. If the orifice be large enough to admit particles, syringing corrects the difficulty, or a plate may be made to cover the break.

Concerning abscess proper of the antrum, it is to be set down as the rarest of rare diseases. Abscesses, described so frequently as occurring in this cavity, will commonly be found to have origin in the alveolar border, and, if treated like any ordinary case of alveolar suppuration, will generally at once succumb. (See *Alveolar Abscess, Anomalies of Dentition.*)

While, says Dr. Richardson, we cannot trace out the nature of that condition of the blood which gives rise to purulent formations, we are informed by observation of the external conditions which foster it. We learn that the pus-producing disposition is an indication of deterioration of blood. We see that when the system is enfeebled, whether by diathesis hereditarily supplied, as by the strumous diathesis,—whether by epidemic influences, or whether by deprivation of nitrogenous food, or the inhalation of bad air,—that under these circumstances the tendency to purulent formations in local structures is marked, and that, in extreme instances of the kind named, the act of suppuration may take its absolute origin from blood thus depressed.

Hence we have reduced almost to a principle in medicine the saying that suppurative tendency is a sign of an impaired or vitiated nutrition. Hence, also, we reason in speculative argument, that pus is lymph transformed into a lower form of organization, and we adduce, in evidence of this view, that the purulent fluid is incapable of organic construction, and that in animals in which the respiration, the circulation, and the animal temperature are more than ordinarily active, the formation of pus, even in an open wound, is an occurrence almost unknown.

These remarks, from a lecture by Dr. Richardson, cannot fail to be suggestive; they have indeed much meaning; the student reader, however, is to be reminded that their signification is limited. Puruloid conditions are, without doubt, and as the rule, perhaps, indicative of asthenia; but it would be very wrong to jump from such data to the conclusion that every puruloid disease requires treatment from a constitutional stand-point; and particularly will this hold good as suppuration of the antrum is concerned.

All diseases are to be treated on principle. M. Ricord, as many readers will remember, has a favorite prescription for gonorrhœal purulency, which runs as follows:

R.—*Pulveris cubebæ*, ℥vj;  
*Ferri carbonatis*, ℥ij. M.

Now, anybody can understand that such a combination would naturally act well on a debilitated system; it is, perhaps, a happy prescription for half the roués of Paris. Where applicable, it would answer as well for a puruloid antrum. The author recalls treating a gentleman for a gonorrhœal difficulty, which had been contracted almost immediately after getting over an attack of syphilis. This patient was medicated locally over six weeks, a defying dis-