

it may very well be recognized as possessed in itself of power sufficient to a cure, doing chemically that which the gouge or bur does mechanically. The strength in which an acid is to be used depends entirely on the effect desired to be accomplished. If employed in the anticipation of decomposing carious bone, the undiluted aromatic sulphuric is never found over-strong. Personally, the author has frequently made a test strength much greater, using, indeed, the officinal ordinary sulphuric acid, taking, however, the precaution to make direct applications by means of a stick brush. Where acid is used merely as a stimulant, the aromatic is to be preferred and is to be used diluted *pro re nata*.

CASE II.—French lady, about twenty-three years of age; caries of base of alveolus of right cuspis of superior jaw, involving the palatine process, with discharge beneath the covering of the hard palate; two tumors, one the size of a hickory-nut, the other that of a hazel-nut, existing.

*Treatment.*—First opened the sacs, giving vent to the accumulated pus, the bone being found denuded quite the size of a dime piece. Once each day, for the period of two weeks, the sacs were injected with commercial sulphuric acid and water, one part of the first to twelve of the second. At the end of this time the cure was complete, granulations after the sixth day being recognized as covering the exposed bone.

In this second case, observation elicited the fact that the acid acted just as any other stimulant would have done. Iodine or zinc might have been used with a precisely similar result,—power existing in the natural force of the patient to overcome the destructive condition, requiring only the aid of slight stimulation.

CASE III.—Merchant from New York City; caries of both palate plates of superior maxillæ. In this case, while two sinuses existed, the mucous envelope of the hard palate was found separated from its bony base, forming a tumor which half filled up the mouth. Examination revealed the palatine processes riddled with holes. This was a character of case most admirably suited to acid treatment, and which was recommended. A diagnosis of different character afterward offered in another city resulted, however, in resection of the jaws; a performance as unnecessary as the diagnosis was faulty, and from which operation the author is under the impression the patient died.

CASE IV.—A very delicate lady, about twenty years of age; caries arising from presence of a lateral incisor tooth containing a dead pulp. When this patient first presented herself, no external evidence of disease existed, except that implying chronic inflammation of the membrane surrounding the root of the tooth, the organ being loose, slightly elongated, and sore; the gum, however, over the apex of the root was healthy-looking. Treatment directed to the cure was commenced by drilling an opening into the pulp-chamber, through the palatine face of the tooth; the cavity entered, a discharge of pus was the result. A succeeding step was an exploration of the parts about the

apex of the root, effected by passing a sharp steel probe through the soft tissues. The probe, meeting bone, was thrust forward, revealing a cavity the size of a hazel-nut, the parietes of which were found spongy and disintegrating. This cause, condition, and character of caries are most frequently met with in the upper jaw. Treatment of the case, which resulted in a cure in ten days, was as follows:

The pulp-chamber was thoroughly washed out with water medicated with creasote. The length and circumference of the pulp-canal were measured, and a delicate pyramidal cylinder of gold was passed and consolidated to the apex. This manipulation was not, however, a necessity, but had reference to the preservation of the future usefulness and color of the tooth. This accomplished, the parietes of the carious cyst were well broken up by means of a sharp excavator, and the detritus removed through the aid of a syringe. Injections of sulphuric acid and water, one part of the first to eight of the second, were now used for ten successive mornings, when the cyst was found filled with organizable material, and the cure remained complete.

Since penning the above illustrations, which pertain to the first of the preceding editions of this work, the author has operated on many cases of caries. There seems nothing to add except to commend aromatic sulphuric acid, employed pure, and freely, and to indorse the surgical engine and its appendages as being worthy to take the place of all operative means in common use.



## CHAPTER LII.

### NECROSIS.

NECROSIS, signifying death of bone, while a disease common to both the superior and inferior maxillæ, exhibits decided preference for the latter, attacking it, as the author is led to infer from the experience of his own practice, in twenty cases to five of the former. The lesion presents a twofold primary expression. It commences as a general osteitis: stasis of the circulation quickly antagonizing nutrition, thus killing the bone outright; or, as commonly witnessed, it arises out of periosteal disease, the membrane affected being the periosteum proper, or, as recognized in a great majority of instances in which the condition is met with, the alveolo-dental tissue,—periodontium. In such primary membranous associations, either the tissue, as it reacts on the bone life, is found dead, or it is seen separated from the bone by a degenerating plastic exudate.\* In such inflammations and separations, it is to be inferred that the layer of bone immediately adjacent the membrane would be the first affected; this is so truly the case that timely incisions and the combating of the inflammation are most influential in the limitation of the disease,—this being markedly exhibited in periodontal inflammation. The superior jaw, however, is much more liable to take on a general inflammation than the inferior; but the higher vascularity and resistive force of that part seem to enable it to resist the destructive action and to limit the part overwhelmed.†

\* In necrosis confined to part of a bone, the increase in the vascularity of the parts is apt, especially in young persons, to result in hypertrophy of the remainder.

† Necrosis signifies death, and, as the human body at large is concerned, death relieves the surgeon of his duties. Partial death, because of the relation of a lifeless to vital parts, and because the changes of separating the dead from the living differ as to the situation and circumstances of parts, demands a close and very practical consideration on the part of a practitioner.

A particular portion of bone being deprived of its nutrition, attempt at separation and exfoliation is an immediate consequence. The phenomenal expression of throwing off a portion of dead bone and as well the destroying of an offending part is found in the inflammatory act. Circumvallation is the rule as to slough and sequestrum. To appreciate the process, it is only necessary to consider the blood supply to a part interrupted by an effusion of lymph, which lymph proceeds to coagulation, and which consolidation compresses little by little the vessels, until finally obliterating them. In traumatic sequestrum, *i.e.* where a piece of bone is broken from its bed, the signification is the same, the clinical difference being that in this latter case the nutritive interference is by reason of laceration of the vessels. Purulency is an associate of exfoliation. To appreciate this consists in a

Inflammation of the jaws, whether osteal or periosteal, is primarily to be treated on general principles. If acute in character, we may first try the effect of the hot pediluvia and saline cathartics. These failing, the parts are to be well scarified, or leeches may be applied, or blood taken from the arm. Diaphoresis can be employed. In short, antiphlogistics of any and every nature, promising control of the excitement, may be pressed into service. If all, however, fail, and pus form, vent cannot too soon be given that fluid. When, on the contrary, an inflammation is chronic and asthenic in character,

recognition of a mass of circumferential exudate unable to do more than partially organize itself, falling back quickly into a degeneration expressive of pus, pus being nothing else than abortions of granulation-corpuscles. Purulency is the act of floating. A dead part is lifted or floated by means of pus. Pus continues to form so long as a dead part remains in contact with a living seat.

A pyogenic membrane is a sheet of granular lymph making effort to organize itself. A pyogenic membrane ceases to be the moment sufficient power accomplishes the act of organization. A pyogenic membrane does not secrete. Pus is not a secretion, but a degeneration.

Demarcation is a line expressive of a surface of separation; all in front of this surface is the sequestrum; all back of it is vital.

To demark a part is an act related with varying time and systemic energy. The process may extend over months or it may accomplish its end in a very few weeks. Nine months is the ordinary time required for exfoliating a lower jaw.

A sequestrum prevented by the circumstances of situation from being thrown off becomes enveloped by a case of new bone. This is found markedly with the instance of the inferior maxilla, it being, as a rule, necessary to break through a case in order to get at the dead part.

Osteophytes are expressive of attempts at ossification. As a rule, osteophyte after osteophyte dies before sufficiency of force is found to complete organization. At a certain stage in the processes of exfoliation and repair osteophytes are to be met with irregularly interspersed throughout the affected region, and too often are found converted into loosened sequestra, which require to be removed.

Periosteum, as well as bone itself, constitute the osteogenetic agencies. Both are no sooner relieved of the incubus of a dead part than evidences of repair are exhibited. Both exude and organize bone pabulum, both enter the work as repairers of damage.

The student familiar with the processes of exfoliation and repair, as flesh lesions are considered, has nothing different to learn as concerns bone surgery. There is first, as the result of injury, extravasation into the cellular structure, into the cortical substance perhaps, and certainly beneath the periosteum. As a result of such extravasation, nutrition is entirely cut off from the lymph-surrounded island. The death of the island following, the most immediate layers of lymph degenerate, thus affording pus, which is the eliminating or rather the extruding agent. Repair of bone and of soft parts are the same, save as difference of tissue is concerned.

Granulation material, incapable of organization, needs assistance in the shape of stimulation. Cleanliness is an essential, and dead osteophytes are to be picked or washed away as soon as discovered.

As an injection acting peculiarly happily where osteophyte degeneration exists, no agent known to the writer acts so happily as aromatic sulphuric acid, the strength used varying with the indications; equal parts of the acid and water is an ordinary injection, or the medicine may be used on cotton, a cavity being loosely stuffed.

A second stimulant and antiseptic of most satisfactory response is found in a combination of capsicum and myrrh (the tinctura capsici et myrrhæ of the Pharmacopœia). This is used diluted with water, the proper strength being expressed by a bluish-white color.