points situated as exhibited by the cross-lines, are to find self-cleansing surfaces after the manner displayed in the succeeding cut (Fig. 77). To so alter the faces of these teeth, a disk of half inch diameter is used (see Fig. 78). Fig. 79, after T. T. Chupein, D.D.S., shows several teeth, molars and

FIG. 76.

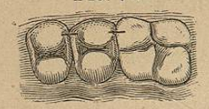
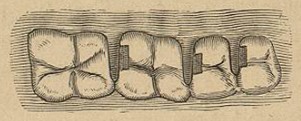


FIG. 77.

FIG. 78.

FIG. 79.



bicuspidati, which are filed in the treatment of approximal caries after a manner that is not too highly to be commended. When engaged in dental practice it was ever the habit of the author to place approximal faces in relation as here shown. It is the only proper way to prepare such teeth for the reception of plugs, as will surely be made evident to every practitioner by experience. The original relation of these cavities to each other is appreciated by a glance at the diagram.

A diamond reamer devised and presented to the profession by William G. A. Bonwill, D.D.S., has a large circle of admirers. This instrument does its work with thoroughness and rapidity. The pros and cons of separation claim large attention at the hands of the experienced. This book is to be understood as indorsing or condemning the practice according to the circumstances of its performance.

CHAPTER X.

DENTAL THERAPEUSIS.

A CARIOUS tooth is to be saved through the character rather than by the quality of a plug. The expression of gold is one of compatibility with dentine; that only. It is a substance wholly without therapeutic meaning, save as such meaning lies in an ability to protect an exposed weak surface against external agents of offence. Teeth made up of solid, resisting stroma are well treated if invariably filled with gold. Preference assuredly is to be given this metal in instance of every individual case, *cæteris paribus*, where a plug is to show. It is also to be given where elegance and purity of expression come at all into consideration. In a word, it is desired to have markedly understood that the teachings of this volume favor the employment of gold as a tooth-filling material whenever and wherever not contra-indicated. It is as well desired to have plainly expressed the view that fully one-half the operative dentistry of the day differs in no respect from a jeweller's work.

To be able to fill a tooth solidly and beautifully with gold, especially as contouring is concerned, is to have achieved a very creditable accomplishment; it is not, however, to have learned anything scientific. What is done is not half so difficult as things being accomplished every day by workmen who think nothing at all of what they do.

Operative dentistry is not special surgery: it is art, not science. In this respect Oral Surgery is of little relation with dentistry; that art being viewed as a profession whole in itself.

Whoever would treat and fill a carious tooth in relation with the laws of surgery is to treat and fill it in relation with indications. A filling of gold is an inert filling; it does nothing but stop a hole. Removal of a thoroughly well-made plug of gold, which has remained in relation with a cavity intact for many years, is not apt to exhibit change in the parietes of the cavity; the part remains as when brought in relation with the metal.

Other materials brought in contact with the parietes of a cavity in a vital tooth are found on removal to show changes; these have stopped holes, they have as well worked therapeutically.

A first consideration, as reference is had to selection of a tooth-filling material, may be instanced as referring to thermal conductivity. With some, with a great many teeth, such conductivity means nothing; with others, a great many others, it means inflammation of a pulp.

Gold is the most marked among the tooth-filling materials as a conductor. Where irritation is contra-indicated the metal is not judiciously to be used

except in combinations. Where a cavity is large or a pulp nearly exposed non-conducting substances are to underlie plugs made of gold; otherwise plugs are to be made of other materials.

Teeth are found where gold is unsuitable because of its density; a soft tooth filled with cohesive gold, the mallet having been used, is oftentimes felt by the patient as possessed of a stuffed feeling; the discomfort being so great as to compel removal of the mass.

The opposite of gold, conductivity being considered, is gutta-percha. Judgment plays the one against the other.

Soft teeth are most surely to be saved by a prophylaxis that considers a re-excitation of the calcific power lying in the dental pulp. Agents used with this intent, named in the order of the excitant quality possessed, are chloride of zinc, copper, tin.

To recalcify a tooth means to harden it. To harden the parietes of a cavity of decay means to render the tooth resistive of external influences. Calcification arises out of judicious stimulation of a pulp; over-stimulation changes excitation to degeneration: defeats and perverts, consequently, the result of an intention.

To judiciously use oxychloride as a filling material is to possess measurement of the wants of the tooth to be filled. A majority of teeth can be recalcified. What, however, proves the equitable stimulation of one is over-stimulation to another. It is not to be denied that chloride of zinc has destroyed more pulps than it has calcified teeth. No rule resides in the measurement of its use; proper employment of the agent lies in deductions arising out of experience.

In over-excitable teeth gutta-percha takes the place of the zinc chloride; or, in instances, the floor of a cavity may be covered with the gum or with a layer of oxide of zinc, and the oxychloride placed upon this. Where gutta-percha is used the red variety is to be preferred.

Where gutta-percha is selected as a material for a foundation it is not infrequently to have advantageously incorporated with it fine filings of copper; or, otherwise, dust of the metal may be spread over the floor of the cavity and the gum used to hold it in place. Tin filings and sheet-tin apply admirably in the same direction.

Oxide of tin, found in connection with all tin plugs, is a reliable medicament as the calcific process is concerned. Teeth from which the finest made gold plugs fall away by reason of secondary decay are restored to integrity through the use of tin. As a rule, all children's first teeth, and all soft teeth, are filled safely where tin is the agent employed. In many cases the removal of gold plugs and the refilling of the teeth with tin foil results in the preservation of a denture. After recalcification the tin may be replaced with gold.

The progress of secondary calcification is to be measured by the occasional removal of a therapeutical plug. If it be found in such examination that

the process is not advancing with sufficient sureness or rapidity, opportunity is afforded to remedy the default in the application.

Electrical disturbance is to have consideration. Viewing the matter apart from unsettled theories, it is undeniably the fact that a plug made of gold or of amalgam, more particularly of the former, quickly becomes imperfect at a point where metal, gum, and tooth associate. Where, in filling such teeth, dryness was secured, the explanation of the deterioration is to be assumed as lying apart from original defect in manipulation. Such teeth are saved by making a neck plug of gutta-percha or of tin.

Amalgams made with cadmium as a component, when used in a tooth, induce a condition of the pulp analogous to albuminoid degeneration. On the contrary, admixture being made with copper the result is so peculiarly tonic that subsequent years will not unlikely show the pulp contracted to a thread, this arising out of the physiological effort, made by the organ, at calcification.

A concluding reference is to be directed to the use of agents acting as parasiticides. No tooth is prepared for any, save an oxychloride, plug until a fungus-destroying application has been made to the cavity to be filled. Teeth of loose structure most particularly are infected with parasites. These parasites are to be eradicated, for it is these which conduce much to leakiness, which leakiness, in its turn, has related with it the meaning of tooth or plug decomposition. Such decomposition being resultant of a battery made by the juxtaposition of two solids and a fluid.

As a parasiticide creasote conspicuously recommends itself. It is to be used with every plugging material save those containing zinc chloride, this last being an agent of the same import. A cavity thoroughly saturated with creasote is rendered clear of all fungi.

CHAPTER XI.

THE ORAL FLUIDS.

THE principal fluid found in the oral cavity is the saliva. Other fluids are those coming into it from without, those regurgitated into it from below, and the secretions from mucous and associated glands. The oral fluids have to do with dental caries.

What is known as saliva is a commingled fluid secreted by three sets of glandular bodies,—namely, the parotid, the submaxillary, and the sublingual glands,—while another association of the fluid, as it is met with in the mouth, consists of a substance known as mucus, which is furnished, in varying quantity, by follicular glands lodged in the oral and pharyngeal mucous membrane. To see this latter, wipe the roof of the mouth, when it shows itself as dewdrop-like particles standing over the surface. Other admixtures of the fluid consists of particles of articles of food, cast-off epithelial scales, animal and vegetable parasites; these latter commonly in great variety.

The type of a salivary gland is seen in a bunch of grapes; the tube of outlet corresponds with the branch, the individual canals with the stem of the fruit, the secreting cells with the fruit itself. The development of a gland begins with the canal, this sending off bud-like processes which find accommodation in a cellular blastema; cells, canals, and blastema comprise the bulk of an organ.

Analysis of true saliva is more or less an unsatisfactory proceeding, owing to the difficulty of securing unmixed specimens. In 1000 parts ordinary analysis yields in the neighborhood of 990 of water and 10 of solid matter. A formula made by Dr. Wright gives the solid matter at 11.90, as follows: ptyaline, 1.80; mucus (and epithelium), 2.60; fatty matter, .50; albumen (with soda), 1.70; sulpho-cyanide of potassium, .90; alkaline and earthy salts, 3.20; loss, 1.20. Variation of from 7 to 12 is suggested by Carpenter as allowable within the health range. The quantity secreted daily by the healthy average man he approximates at 18 ounces.

Saliva is normal or abnormal; the first state relates with health, the second with pathological conditions; to appreciate the latter requires understanding of the former.

Parotid Secretion.—The secretion of this gland has a specific gravity of about 1.006; it is without viscosity, according to late writers, and contains in solution carbonate of lime, together with traces of chloride of potash, bicarbonate of soda, and sulpho-cyanide of potassium. Magitot gives 95 to

98 parts of water to the 100 against 2 to 5 parts of the solid substances named.

The parotids secrete alternately, and from the fact of their excessive development in ruminant animals are to be esteemed the lubricants of the oral cave. Meal or dry bread put into the mouth excite these glands to vigorous action. This fluid seems to be variously acid, alkaline, or neutral as times and circumstances relate with it; it may be inferred to be the second of these when the carbonate of lime deposits against the molar teeth in form of tartar. Innervation lies with the 5th and 7th nerves, explanation existing in this of the profuse salivation found so commonly associated with oral operations. Influence of mind on glandular secretion finds a striking example in the parotid, violent emotion suspending elimination; the Indian method of discovering a criminal by means of rice held in the mouth is familiar.

SUBMAXILLARY SECRETION.—The secretion of this gland is markedly in relation with the process of insalivation, as witnessed by the excitation of its action when sapid substances are tasted and its almost total suppression during periods of fasting. Experiments made by Claude Bernard show the excito-motor to lie with the gustatory and chorda tympani nerves. The fluid of this gland while very clear is yet very tenacious. Excess of ptyaline affords a coagulable appearance under the influence of cold. Animals making use of the viscid principle, as example is furnished in the ant-eater, have submaxillary glands of large proportion. The secretion, according to analyses made by Bidder, contains 3, in 100 parts, of organic, and about 5, in 100 parts, of inorganic matter. No sulpho-cyanide of potash is found.

Sublingual Secretion.—This differs but in degree from the secretion of the submaxillary gland. A viscidity characterizing it is owing to the presence of ptyaline, which is proportionably greater than in the other.

Accessory Parotid.—This is an associate gland related with the duct of Steno; its secretion is thought generally to correspond with that of the immediately preceding, and with that of the submaxillary.

Claude Bernard performed the following experiment, which affords clinical demonstration of the difference alluded to as existing in the composition of the secretion from the different glands. First he effected an entrance through external incision into the œsophagus of a horse, extracting the food bolus as it descended from the mouth; weighing this, he found that it had increased in weight elevenfold as a result of the saliva it had absorbed. A succeeding step was to tie Wharton's duct, with the result of finding that it required forty-one minutes to masticate what before had taken but nine; while the mass, when withdrawn from the œsophagus, was coated with a glutinous mucoid fluid, the interior being dry and friable; the increase of weight was only about three and a half.

Healthy saliva is a slightly opalescent fluid, somewhat glairy, commonly alkaline; the meaning of it in the animal economy is both excrementitial