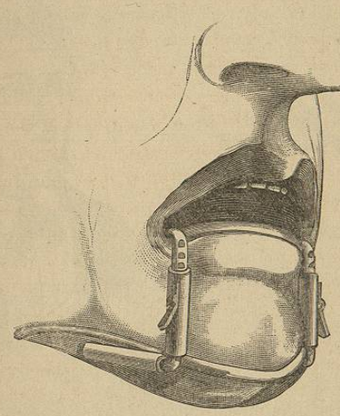
been able to secure an impression which will articulate its cast, which in all probability you will not), articulate the fractured portions with the cast of superior maxilla. When you have the articulation correct, cement the fractured portions by the addition of fresh plaster to the breaks. Next warm some impression compound and place in the upper tray of splint, then press the articulated cast of inferior maxilla into the impression material, thereby getting an impression of the jaw as it should be to articulate with the superior. Insert the cup into the mouth, and carefully work the natural teeth into the impressions made for them by the cast. Adjust the clamps and the lower cup, placing a little plaster in the lower cup to fill up any inequalities in the

FIG. 520.—SUDDUTH'S MENTO-DENTAL SPLINT.



jaw not met by the lower cup, thus making a *perfect splint*, holding the teeth above and the lower portion of the inferior maxilla below. If it be found that the circulation of the facial artery is interfered with, a groove can be cut in the plaster in lower cup to accommodate the vessel.

It is sometimes the case that from comminution, or other causes, fractures of the inferior maxilla, like fractures of other bones, fail to unite. In treating these cases the practitioner finds each one possessed of special indications. If necrosis exist, exfoliation of the sequestrum is to be awaited. If the vital force seems at fault, this is to be stimulated and elevated. If it occur that the ends of the fragments have become rounded, and perhaps tipped with a species of cartilage, operative means are demanded,—such means varying with circumstances. One plan, considering this last condition, much approved, is to pass through the parts a seton, composed of several strands of wire, to be removed thread by thread, as inflammation requires to be modified. Or, in place of the wire, other material, as silk, twine, tape, etc., may be used. An

operation consists in boring one or more holes through each of the fragments, and the tying of them together with sutures of wire. Resection is a means successfully employed by many. Irritating the ends by rubbing the fragments together, thus provoking the desired inflammatory action, is still another plan.

Attention to the circumstances of a patient suffering from ununited fracture is important. A case exhibited at one of the clinics of Professor Henry H. Smith was plainly enough due to the individual having confined himself exclusively to a diet of potatoes, such food, in this case at least, being insufficient to accomplish the repair.

Complications, whatever their character, are to be treated on general principles. It is impossible to direct any special course, for the reason that such conditions are constant to no rule. Hemorrhages of moment, so frequently alluded to, have not been met with by the author. Those occurring, are nearly always secondary in character, and it is well, where possible, to treat them in anticipation: for example, an injury which has lacerated the facial artery would perhaps yield little or no hemorrhage at the time of accident; yet, as the process of sloughing should expose the sound part of the vessel, hemorrhage might be profuse and alarming enough. In these and corresponding cases circumstances, in special instances, justify one in searching for the ends and ligating them, otherwise cutting down upon them. (See *Ligation of Arteries.*) Injuries to the dental organs are to receive due attention: it is not by any means every loosened tooth that is to be removed, nor every displaced one that is to be looked on as lost to usefulness. The proper plan is to wait on nature's indication. The practice of the writer is to remove no important tooth or teeth under circumstances of accident until shown by the extent of suppuration or by a threatening appearance of the parts that retention is impossible. As a means of support to loosened teeth, apparatus of the least irritating nature is to be employed.

In cases where teeth have been broken off, parts of roots remaining in the gum, indications demand the removal of the crowns should these be hanging attached to the gums. It is desirable also that the roots be removed, but this, as a rule, it seems impossible to accomplish, so that nothing better is to be done than to combat the associated inflammation and wait. Acute manifestations having been mastered, the most satisfactory results possible to be secured are found in the use of the tinctura myrrhæ et capsici; teaspoonful to half-goblet of water; gargle frequently. Fractures occurring about the neck of the inferior jaw are to have the displacements corrected by the application of such compresses as are found to answer the purpose, no matter how closely such applications follow any special rules, nor how far they depart from them. The author does not remember ever to have treated, in the course of his professional life, two fractures precisely in the same way. (See *Inflammation.*)

In breaks of the superior jaw, complications, while rare, are still more

anomalous. Thus, a case is recalled where it was necessary to remove the whole alveolar process of both maxillæ, the accident being resultant of a kick received from a mule. In this case the patient was a man broken down by drink and dissipation. A process was anticipated which was sure to have resulted, but which, to have been accomplished *per vias naturales*, would have cost the patient weeks of suffering, not unlikely, life. The writer has seen a case of fracture of the right upper jaw, where the alveolar process (the fractured part) hung at least a quarter of an inch below the common level. In this case the part was moulded into its place and supported by a simple strip passing across the jaw and fixed a little beyond the fronto-parietal suture. In three days the piece became self-supporting, and in two weeks the patient was eating comparatively solid food.

Gunshot injuries of the face and jaw are of every conceivable variety. The surgeon does primarily, in such cases, what he can, and leaves the rest to nature. (See *Obturators.*)

With Hamilton, the author has to remark that it is impossible to discuss in detail the varieties of accidents to which the complicated structures of the face are exposed from balls or other missiles. Certain general rules are, however, to be observed. For instance, as suggested by that surgeon, missiles entering and lodging in the face are to be extracted as speedily as possible; and, whenever it is practicable, they are to be removed through the mouth. If permitted to remain, they expose to the danger of secondary hemorrhage, and increase chances of subsequent disfigurement.

Loose fragments of bone are to be replaced, unless much detached from the flesh and periosteum, experience proving that these unite in most cases with facility.

No piece of skin which is torn up is to be removed unless it be absolutely dead; it is to be laid back carefully in place, and retained either by a few delicate sutures, or by some gentle means of support. Tight ligatures and firm straps of adhesive plaster, being apt to bind the tissues and destroy their little remaining vitality, are not to be employed. The best means of supporting a fragment of skin in place, in many cases, is to lay upon it a thin piece of lint smeared with cerate, and over this a pledget of cotton-batting, securing the whole with adhesive plaster or a roller.

As soon as the inflammation and consequent induration have completely disappeared, and not before, it will be proper to make the final anaplastic operations.

An addendum to these suggestions of Dr. Hamilton is to be made by directing attention to the necessity of controlling and combating inflammation. To this end cold water is freely used locally, saturated cloths being renewed as the temperature is elevated; or the water may be medicated; acetate of lead and laudanum being generally employed. An admirable antiphlogistic application is prepared by adding to Oj of water ℥ij of the former and ℥ij of the latter. If a patient be robust and plethoric, it is, in most cases,

advisable to assist local treatment by cathartics,—sulphate of magnesia or the ordinary Seidlitz powder being prescribed.

Imperfectly treated fractures not infrequently induce so much discomfort as to warrant secondary breaks. As an illustration, the following case may be cited: T. H., an employé on the Camden and Amboy Railroad, received a double fracture of the inferior jaw, by being in some way jammed between two cars,—one break being on the line separating the second and third molar teeth, the other, the line of the cuspis root of the same side. A treatment resorted to in a hospital to which he had been carried failed in retaining the intermediate part in place, so that, on uniting, the teeth lay flatwise, presenting the buccal as an articulating surface.

Deciding on the propriety of an attempted correction, the bone was rebroken through the imperfectly solidified callus, and the depressed portion, being raised into position, was retained by a silver splint,—this splint being made and applied as described and illustrated. (Fig. 521.) As a consequence of the injury inflicted, several pieces of the callus necrosed and came away; but the daily injection of a much-diluted tincture of capsicum and myrrh resulted in such solidification of the parts in their new position as to permit the disuse of the splint,—terminating in a cure most satisfactory to all concerned.

Description.—The bone being rebroken the fragment was raised into position, and while held by the tongue of the patient upon the inside and the fingers of an assistant upon the outside, an impression in wax of the whole lower arch was secured. From this mould a silver plate, C, was prepared,* which fitted accurately the lower arch when the disjoined piece was in position. A succeeding step secured a wax mould of the upper jaw, from which model a second plate, H, was made. This plate, as seen, covers the side but not the front teeth; it covers as well the roof of the mouth.

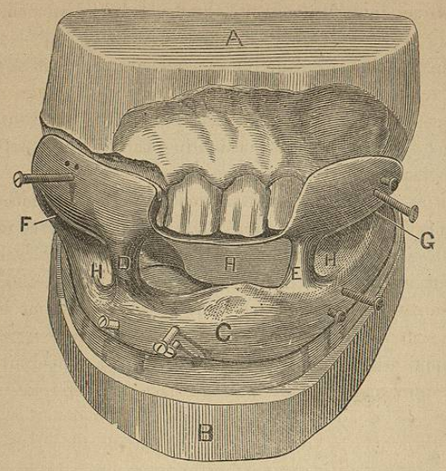
The two plates ready, a succeeding step placed them in position, exactly as seen in the diagram. The jaws being separated to an extent permitting of the convenient passage of food, relation was secured temporarily through the use of adhesive wax thrust against and between the plates on either side in the spaces existing between E, G, and D, F. The plates thus related were lifted from the mouth and being placed in a plaster matrix were soldered together at the seats of the wax application. Afterwards cleaned by being dropped into a dilute sulphuric acid bath, the fire coat being thus removed, they were polished with pumice and rotten stone. The fracture was now again set and the piece put in position. The patient went at once about his business and in six weeks was well. This splint is the one referred to a few paragraphs back. To hold it in place, or rather to secure fixed relation of the jaws with it, the bandage already described and figured is to be used.

As a means of dressing in any complicated jaw fracture the inter-dental splint is as invaluable and reliable as it is simple of construction and easy of

* For manner of making see *Prosthetic Dentistry*: also *Obturators.*

application. The screws passing between the teeth—shown in the cut—are not longer found necessary. A bandage, tightly enough applied, prevents

Fig. 521.—The Inter-Dental Splint.



all motion. It will be understood that the plate line seen below the superior incisor teeth is, in the cut, with a view of showing its relation with the palatal faces of these organs; when the plate is in place the line is, of course, resting upon the gum adjoining the necks of the teeth.

Fig. 522.—Dental Splint.

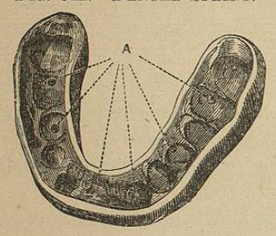
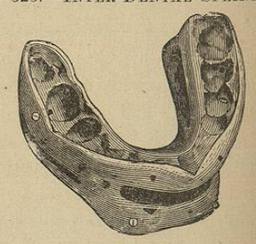


Fig. 523.—Inter-Dental Splint.



Inter-dental splints are now, in America at least, more frequently made of gutta-percha than of metal; this, presumably because of the easier working of that material. Metal, however, is, in the estimation of the author, most decidedly to have preference; gold to be used, if the patient be rich enough to bear the expense. Silver, when fire gilded, is an admirable substitute.

Fig. 522 exhibits a splint of gutta-percha which is made most simply by

warming and moulding the material over a cast secured from a wax impression obtained as described. Being hardened by the use of cold water, and trimmed, such a splint is prepared and applied in a little time. A represents alveoli accommodating the teeth. Fig. 523, after model by Dr. Gunning, shows an inter-dental splint, made of this same material, fitting both jaws.

An inter-dental splint of satisfactory character and entirely general in application is to be prepared and applied as follows: Make a curved tin channel corresponding to any inferior jaw that may be selected. Upon the base of this first set and attach second channels made to loosely correspond to the molar regions of the superior jaw. Putting the three in place, attach them by means of wax, the jaws being separated to the width of a finger. Remove carefully from the mouth and solder. Make several to correspond reasonably with the varying curvatures of different arches. To apply, fill the channel with softened white beeswax, set the fracture, and, placing the apparatus in correspondence with the arches, let the patient bite into the wax until the plates are reached. Instantly bandage to prevent movement, and, this accomplished, harden the wax by cold water held in the mouth. This apparatus proves as satisfactory as it is seen to be simple.