

employed. The success in way of adaptation of parts was perfect, the whole line of the wound being exposed, permitting full and frequent examination. In two weeks the parts had united so firmly as to allow of the removal of the compress and bandage. The only medication employed consisted in the administration of an occasional Seidlitz powder, and a glass daily of porter, with repeated applications to the wound of the dilute iodine, one part of the officinal tincture to four of water.

CASE VII.—Little girl fell over the shafts of a wagon, cutting, in some unappreciated way, her tongue directly in twain, for the distance of an inch down the middle. Hemorrhage was very profuse, requiring the ligature of a vessel. This wound was united by two stitches of the interrupted suture passed deep in the substance of the organ; cold water directed to be held in the mouth quite continuously, for the first day; patient fed on ice-cream and jelly. Third day, stitches removed, union complete, ligature loosened, and was pulled away on the seventh day.

CASE VIII.—Brigadier-General D., standing upon an outlook, was struck by a sharpshooter, the ball passing through the right ramus of the lower jaw, shattering the bone, passing forward across and through the tongue, emerging from and splintering the body of the bone on the left side. The treatment pursued upon the field had been to check an alarming hemorrhage from the region of entrance of the ball, by stuffing the wound with charpie saturated with Monsel's solution of iron, throwing a bandage over this, and hurrying the case to the hospital.

Condition on entrance.—Patient arrived, and was put under the author's care about eleven o'clock at night; complained, by writing on a slate, of great thirst, with entire inability to swallow, and of the painful effort required to breathe; had not been able to drink since the accident, which happened two days before.

Treatment.—Examination revealed marked displacement of the middle piece of the fractured bone. This, with the tongue being pulled backward by the hyoid attachment of the genio-hyoglossal muscles, sufficed to explain part of the difficulty in respiration and deglutition. The tongue itself, however, was much swollen, and had a ball wound through its base. Two primary indications thus presented: to restore the body of the bone and tongue to position, and to reduce the swelling in the soft parts. The external wounds were for secondary consideration: the patient had to breathe and had to be nourished. The mouth was first well syringed with cold water, which was found most refreshing; the bone was then brought forward, the inferior teeth in front of the superior; the jaws were closed, and held together by a delicate bandage, the middle fragment being thus retained even in front of its natural position, and pulling the tongue forward with it. This accomplished, the patient was propped up in an arm-chair, and his feet immersed in hot water, the application being continued until every vein and capillary was engorged. A local abstraction of blood was not thought desirable, as he had

already lost as much as he could well spare. The result of such a primary treatment was, that in half an hour the sufferer was able to swallow spoonfuls of lemonade. This drink, cold as it could be made, was continued during most of the night, serving by its refreshment to give much comfort, and by its refrigeration to abate the vascular excitement. About four o'clock in the morning the patient fell into a disturbed sleep, which continued until eight. At nine o'clock the tongue was examined by separating the lips and looking at it through spaces which existed between the teeth; the swelling and turgidity had very much diminished. The feet were again placed in hot water, and the blood held in the inferior parts until a sense of faintness was experienced. This gave increased relief. Immediate danger averted, attention was directed to the state of the external injuries, and the line of passage of the ball.

The wound at the external angle of the jaw was found to occupy quite a space in the parotid fossa, the ball having evidently been received as the general had turned his head to address some one behind him. The gap was stuffed with charpie, this being now a black and blood-infiltrated mass; it had evidently been thrust hard and solidly into the wound, and had swelled to double its former size, displacing the parts to a very marked extent. This plug being found firmly fixed, it was left to be removed or not, as circumstances should seem to direct, at a future time. The wound of exit was larger than might have been expected, spiculæ of bone having considerably torn the parts; from it were removed several small splinters. A probe, passed into this opening, revealed the line of the wound running through the base of the tongue obliquely across the mouth. The treatment consisted in a free use of permanganate of potash and water. The patient passed the day in a fair degree of comfort.

Sudden secondary hemorrhage being the next thing to fear, it was determined on the third day to remove the plug; this was accomplished only after a full hour of labor, the charpie having wedged itself into every imaginable space, the removal being effected by the very free use of milk-warm water and the most gentle traction with forceps and scalpel handle. The withdrawal was attended with considerable pain, but without the loss of a single drop of blood. The relief from the sense of pressure afforded was so very great as to change the whole appearance of the injured man, he now breathing and taking his beef-essence with great freedom. The appearance of the wound was really very promising, attempts at granulation being quite evident, while nothing especially threatening was to be observed. The day after this dressing, the patient, in opposition to advice or commands, insisted on being passed to his family in Washington. All the dangers of hemorrhage were exposed and explained to him, but he was possessed of a single idea, getting home. At five o'clock in the afternoon, being continued in charge of a surgeon who had been sent with him from the field, he was driven to the steamer plying between Fortress Monroe and Baltimore. At midnight, while on the

Chesapeake, profuse bleeding came on, which was controlled, as best it might be, by masses of ice held continuously to the wound. The patient died the next day at a hospital on the wharf in Baltimore, under what exact circumstances was not learned; most likely from exhaustion.

CASE IX.—J. B., middle-aged man, gash, from a blow, lacerating the cheek, opening the duct of Steno.

Treatment.—With a heavy-eyed needle, carried a loop from the bottom of the wound to the inside of the cheek: the silk, which was very loose, conducted the saliva into the mouth. Brought the external wound together by strips of resin plaster; no other treatment required, save an occasional dressing. In a week the loop had sloughed through into the mouth, preserving completely the track for the secretion, and the process of granulation had advanced almost to the stage of cure in the external wound. No after-trouble.

CASE X.—C. A., young gentleman, twenty years of age, deep punctured cut in the floor of the mouth just to left of middle line, made by the slipping of an elevator in the attempt to remove root of upper canine tooth. No hemorrhage, or immediate bad sign of any kind; patient very much frightened. Accident had occurred two days before first seeing the case; part very sore and tender; inflammation limited.

Treatment.—Directed arnica-water for relief of the soreness; nothing else indicated or required; the wound healed rapidly and kindly.

CASE XI.—Cut received by young lady, exposing and incising mylo-hyoid artery of left side in the groove; hemorrhage very great and persistent.

Treatment.—Upright position; tinct. erigeron as directed; strong alum solution held to the part on tufts of cotton; afterward thrown with the syringe; ice to the part, etc. No result on the bleeding. The patient becoming affected from loss of blood, enlarged the wound, picked out the vessel with the Liston forceps, and tied it. This, of course, controlled the hemorrhage. A comfortable recovery was made.

CASE XII.—Mr. C. Performed operation on the cheek for a peculiar erectile growth; cut well into the sub-tissue, making quite a deep wound, just as if the part had been scooped out.

Treatment.—Cold-water dressing; waited on nature to fill up wound with granulations; nothing else required, nothing done; the case progressed to a satisfactory cure, excepting as a raised scar remained.

CASE XIII.—Young man, shot through the cheek; the mouth being, at the time, fortunately open, the ball passed out, doing no further damage; no hemorrhage.

Treatment.—Applied cloths wrung out in cold water, for the purpose of controlling vascular action; nothing else done; wound suppurated until the compressed and devitalized tissues were sloughed; then kindly granulated, the patient being entirely well in a month.

CASE XIV.—Patient, young lady. In an attempt to extract the first

molar tooth of right upper jaw, a flap of gum had been torn, extending around the mouth to the left second bicuspid; this flap had been hanging loose some three hours before the patient presented herself.

Treatment.—Cut the piece off, and depended on granulations from the wounded surface for the filling up; patient comfortable next day; entirely well in a week; no other treatment of any kind required.

CASE XV.—Boy, twelve years of age; playing with powder contained in a bottle it unfortunately exploded, throwing the glass and burning grains into his face. When first seen, an hour after the accident, the patient was in the greatest distress; the eyes were completely closed, lashes entirely destroyed, hair singed, face raw and bleeding, pulse rapid, and very irritable.

Treatment.—First, Seidlitz powder, with half-grain of opium; second, removal of such pieces of glass as could be readily picked away with the forceps; third, cold-water dressing. In an hour the patient was fairly comfortable; at the end of which time a second half-grain of opium was administered.

Second day. Face very sore, but no burning pain; picked away several small pieces of glass and a number of the powder-grains. Continued cold-water dressing.

Third day. Reactive inflammation evidently aborted; water dressings dispensed with; used in place

R.—Olei lini,
Aquæ calcis, āā q. s.

With this the surface was protected from the atmosphere until it cicatrized, —a period of two weeks. During the time of cure some little attention was given to the diet, the patient for the first day craving principally ice-cream, which answered very well, and served to allay a slight tendency to irritative fever which existed; the latter four days of the first week stimulating articles of food were interdicted; after this he ate what he liked.

CASE XVI.—Patient, young gentleman. Struck, while on a gunning excursion, by a buckshot, which passed through the lower lip, burying itself in the bone. Patient not seen until the next day; lip too much swollen to permit of examination.

Treatment.—Cold-water dressing to the lip. Mag. sulph. ℥ss internally.

Third day. No diminution in swelling; slight erysipelatous blush; brushed the parts with the following combination:

R.—Tincturæ ferri chloridi, ℥j;
Quinæ sulphatis, gr. xxx;
Tincturæ cinchonæ, ℥ij. M.

In one hour the blush had disappeared.

Fourth day. Inflammation, with the swelling, disappearing very rapidly.

Sixth day. Probed the wound; discovered the shot lying near the root of the first bicuspid tooth; dissected away the gum from the inside, and with a very small curved gouge picked the lead away.

Seventh day. Inflammation back again, confined, however, rather to the inside of the mouth; reapplied the cold-water dressing, and directed a Seidlitz powder.

Eighth day. Better; inflammation rapidly yielding; a little pus escaping from the shot track in the bone.

Tenth to thirteenth day. Track of wound in the bone suppurating considerably; tinct. iodine used.

Fourteenth day. Discharge diminishing; iodine continued.

Sixteenth day. Discharge entirely ceased; patient dismissed.

CASE XVII.—Patrick T., laborer. While engaged in blasting rocks, the patient was struck with great force, just below the orbit, by a flying fragment, lacerating, in a frightful manner, the soft parts of the face, breaking and knocking into the naris the left nasal bone, and severely concussing the maxillary. No hemorrhage; heavy shock.

Treatment.—The patient being a strong, plethoric man, reaction was allowed to establish itself, which it did completely only after the lapse of several hours. Cold-water dressings were, however, at once applied to the parts, every deduction favoring the inference of severe inflammation. The accident occurred in the morning. At seven in the evening, a pine stick, whittled, to make its introduction easy, was coated over the end by dipping it in melted wax, and with this, insinuated into the nostril, the depressed nasal bone was thrust out into place, position being maintained by a tuft of wax-coated cotton, having attached a string for its withdrawal.

Examination of the injured face and maxillary bone revealed contusion and injury to such an extent as to make it evident that the process of cure must be that of exfoliation, sloughing, and repair by granulation; the only treatment was the expectant, and this was a simple water dressing.

Second day. Most decided reaction. Mag. sulph., ℥ss administered in a glass of water; water dressing, medicated with lead and laudanum.

R.—Plumbi acetatis, ℥ij;
Tincturæ opii, ℥ij;
Aquæ, ℥xxx. M.

Cloths wet with this lotion kept constantly upon the cheek.

Third day. Inflammation abating, but patient complaining of feeling hot and generally miserable. Lemonade ordered as a febrifuge, to be made by expressing the juice of an ordinary lemon into a goblet, sweetening, and filling up the glass with ice broken into a coarse powder. To be allowed *ad libitum*.

Fifth day. Wound suppurating; fever all gone; dressing changed back to simple water; waxed cotton changed in nostril,—the replacement giving much pain.

From fifth to tenth day. Water dressing continued; portion of external plate of the bone apparently dying; periosteum evidently destroyed.

Eleventh day. Stimulation commenced; parts wet three or four times a day with the following:

R.—Aluminis pulveris, ℥ij;
Tincturæ capsici compositæ, ℥ss;
Aquæ, ℥xvj. M.

Fifteenth day. Granulations being thrown out from around the edges of the wound; parts brought as closely together as possible, and retained with adhesive strips; nasal fracture doing very well.

Twenty-fifth day. Wound of face entirely healed, with the exception of a small place in the centre, which, when examined with the probe, discovered a sinus leading to diseased bone.

Thirty-fourth day. Piece of bone presented at the sinus; enlarged the opening, and withdrew a sequestrum rather larger than an ordinary fingernail. Examination with the probe, after the removal, gave the fleshy feel indicative of repair. Case dismissed on the thirty-sixth day.

CASE XVIII.—Young man, struck on the side of the face, in a street-brawl, with a slung-shot; face severely cut and contused; outer boundary of the antrum driven backward into the cavity, not fractured apparently, but bent inward.

Treatment.—Cold-water dressing,—no other application for the first three days. After this, the patient being compelled to go out to his work, adhesive strips were employed; repair progressed rapidly, without a single adverse manifestation. The depressed plate of the sinus gave no trouble, soon accommodating itself to its new position; all sense of soreness leaving it by the end of the second week. External wound cicatrized in twenty days.

CASE XIX.—A young man slipped while standing on a stall in a market-house; falling forward and downward upon one of the hooks, the point entered his mouth, broke off three of his upper teeth, perforated his hard palate, and passed into the right nostril.

Treatment.—Seen first one hour after the accident. Pain in the broken teeth unbearably severe. Examination discovered the engorged pulps entirely exposed and bulging from their cavities. A probe introduced through the wound in the palate passed readily into the nares, giving little or no pain. No fracture of the bone, save a few trifling spiculæ about the circumference of the puncture. The roots of the broken teeth were at once extracted, and the case, for the time, left to nature.

Second day. No necessity for any interference; some soreness, but no actual pain.

Third day. Nothing required to be done.

Fourth day. Three trifling pieces of bone discharged into the mouth.

Seventh day. Wound granulating very satisfactorily.

Fifteenth day. Nature unable, evidently, to quite fill up the opening; assisted by scarifying the circumference of the wound, and touching with tincture of iodine.

Seventeenth, twentieth, and twenty-second days. Scarified and touched with iodine.

Twenty-fourth day. Opening completely closed. Case dismissed.

CASE XX.—Gentleman. While striking the iron handle of a chisel in the act of opening a box, a small piece flew off from the hammer, burying itself in the malar process of superior maxillary bone.

Treatment.—With probe, searched in the wound for the foreign body; found it in position as described, with very oblique track through soft parts. Introduced a sharp steel instrument, and, after some trouble, succeeded in working the piece loose; could not, however, get hold of it with forceps without such manipulation as would evidently enough contuse the parts. Introduced a director down to the body, and cut to it; removing it in this way without effort. Closed wound with two delicate sutures, and applied cold-water dressing. In three or four days the parts were entirely well, not the slightest suppuration having occurred,—no noticeable scar.

CASE XXI.—A little boy, Harry H., while playing with a wooden paddle which had been made for use in rendering lard, slipped while having one end of it in the mouth, the weight of his body carrying the stick through the soft palate, making a complete separation between the veil and hard parts. This patient was first seen three days after the injury. No inflammation of consequence existed.

Treatment.—Etherizing the child, the parts were stitched together by means of interrupted sutures of silver wire, the approximation being maintained by perforated shots clamped over the threads. Only a very limited union was secured, the two most important stitches sloughing out. On the fourth day from the introduction of the first stitches, those which had been lost were replaced, which last, by the eighth day, also sloughed out, yielding no increase in extent of the union, but happily being associated with such extent of granular face to the wound that, when the veil was pressed upward, it met the part from which it had been torn. An impression of the mouth was now taken with very soft wax. From this a model was secured, to which a silver plate was struck. This plate enveloped the back teeth of the upper jaw, but was cut to fit the palatal faces of the anterior. Impressions were next gotten of the inferior teeth, and caps made for the molars. Putting next plate and caps in place, they were related by means of wax, and the apparatus thus associated lifted carefully from the mouth, the piece being completed by soldering the parts together. Thus prepared, the apparatus was put in the mouth, and the two jaws held in relation by means of the author's strip bandage. In two weeks union was sufficiently firm to permit the removal of the splint.

CASE XXII.—Stout Irish lad, twelve years of age, shot in the face by a playmate. In this case the pistol was in the hands of a smaller boy, the

muzzle being directed obliquely upward. The ball, which was a good-sized minié, struck the centre of the nose, and, as it passed upward on the line of its projection, was deflected at an angle of about eighty degrees, by an influence exerted by the nasal bones, against which it struck. This boy was first seen on the second day after the accident. No inflammation, no evidence of shock, indeed, no anything that would lead to the inference of an accident of gravity; even the wound of entrance was scabbed over, looking nothing different from an insignificant sore.

Treatment.—Breaking away the scab, search was made for the course of the ball by means of the ordinary silver probe. As the instrument reached the nasal bones, the condition of deflection was recognized. Examining next the mouth of the patient, a solid projection was observed at the line of union of the palate plates of the maxillary and palate bones. Inferring this to be the missile, an incision was made through the soft parts; this exposed, however, not the ball, but a fractured portion of bone. Removing this, the lead, much flattened, was found immediately above it, being wedged in the site from which it had forced the bone. The boy seemed to require no treatment, and therefore received none. In no way had he a bad symptom.

CASE XXIII.—Michael M., car-driver. Separation from its maxillary attachment of left nasal bone. Deformity very marked; the whole nose looking as if it had been thrust upon one side of the face.

Treatment.—The parts being very much inflamed, application of the lotion of lead-water and laudanum was ordered, and continued until the condition was fully combated; two days being required to secure such desired result. Using now the handle of an ordinary scalpel, the displaced bone was lifted into position, and was retained by making a flattened roll of the common adhesive plaster,—the unspread side out; this, being dipped in olive oil, was directed into place, and retained for a week by a ligature, which kept it well in position by passing over each ear. At the end of this period the roll was withdrawn and the parts left to nature. A perfect cure resulted.

CASE XXIV.—From Langenbeck. Head of patient was caught between a locomotive and its tender. The eyelids were torn away from the orbit, and a deep wound ran down from the inner canthus to the upper lip. A probe could be passed into the antrum: not a trace of the eyeball could be found; while in the orbit was a bluish-black pulsating mass. The nasal bones comminuted. Patient conscious, but sleepy; pulse slow; violent pain on right side of head. A week afterward, as head symptoms disappeared, and the extravasated blood had been somewhat absorbed, a closer scrutiny could be made. The eyeball was discovered to have escaped into the antrum from the orbit by a hole in the orbital margin of the upper jaw, big enough to admit the finger easily,—the axis of the eye standing vertical, the cornea downward.

The fragments of bone were adjusted as well as possible, and the eyeball replaced in the orbit. It was uninjured, and vision was perfect.

About ten weeks after, by two blepharoplastic operations, the eyelids were

brought into tolerably good condition. They could be closed, and usually so remained, but could be opened enough to expose the cornea and permit sight. The globe was, however, perfectly immovable. About five months after the injury, ulceration and suppuration of the cornea occurred, and the globe atrophied.

CASE XXV.—A painter, engaged at some work in the line of his trade, fell from the roof of a three-story house to the street, striking against the rail of a car-track, producing, besides other fractures, compound comminution of the inferior jaw. The writer first saw this man at the Pennsylvania Hospital, several months after the accident. Despite the judicious care he had received, full half the centre of the body of the bone had been lost, the angles being pulled together by action of the mylo-hyoid muscles, the fragments having united just above the hyoid bone. A more lamentable condition it would be hard to imagine. The tongue, of course, was permanently fallen back into the throat. The treatment of the case being kindly transferred to the clinic of Oral Surgery by the surgeons of the hospital, attempt to restore the articular relations of the portions of lower jaw remaining was commenced by separating the united angle, using for this purpose the cutting forceps. This accomplished, reunion was prevented and a false joint secured through the interposing of a tuft of sponge kept in place several weeks. The parts recovered to a healthy condition, a succeeding step pertained to the restoration of relations. This was accomplished by means of metal plates made to fit accurately the lingual faces of that portion of the jaw remaining on either side. Passing across the floor of the mouth, acting upon the plate of either side, was a swivel screw. Elongation of this screw forced the parts into position.

Articular relations restored, a succeeding step was the securing of a wax impression of the parts representing the hiatus, or lost segment, of the jaw. From this impression a model was made in plaster from which, in turn, there was prepared a silver jaw, with teeth attached. This jaw, or segment, when slipped into place, restored and preserved the contour most satisfactorily. When last seen the patient looked not unlike people in general, and was using his artificial jaw and teeth to the required end of enunciation and mastication. (See, for illustration, *Fractures*.)

Burns and Scalds.—Burns and scalds imply injury done by heat. The former is a result of contact with hot solid bodies; whether through radiation, flame, or immediate touch. The latter results out of a relation with heated fluids; these being water, alcohol, ether, oil, or steam.

Burns and scalds classify themselves as simple and complicated, or according to extent of injury. 1. An impression made, either by dry or moist heat, including that of the sun, which has acted as an irritant to the surface of the skin. Result: simple erythema terminating speedily in delitescence. 2. Irritation resulting in inflammation. Result: vesication, the vesicles curing themselves by desiccation or suppuration. 3. Cauterization of tissues. Result: sloughing by dry eschar or demarkation.

The first indication in burn or scald relates with shock; this, in proportion to the injury received, is commonly more severe than from other forms of casualties. It is a matter to be closely appreciated. (See *Shock*.)

As immediate application in burn, the one commonly most conveniently at hand is cold water. In ordinary cases no means insures so great an amount of comfort as fine handkerchiefs spread over the face and kept continuously wet. Such an application continued from one to two hours, or until it ceases to be comfortable, will almost surely relieve a patient of the agony attending on a burn. Where sanguineous reaction threatens, acetate of lead may be added to the water.

Vascular disturbance aborted or modified, a second step in treatment refers to prognosis. A burn or scald, superficial in its nature, may reasonably be expected to resolve itself without greater loss than the epiderm, and without scar. Where a burn has involved the skin proper, tardiness of cure and resulting deformity will be in proportion to the injury received. Lost skin is replaced by scar-tissue. In scar-tissue is deformity. Depth of destruction implies extent of eschar.

Where a burn is superficial, aim lies in the direction of immediate resolution of the induced vascular perversion. The treatment is: first, cold water; second, soothing unguents.

The epiderm is not to be removed in surface burns. Where effusion occurs the vesicles are to be drained by pricks with a needle; otherwise blebs and serum may be left to take care of themselves.

To protect burnt skin against the irritating effects of the air, it is highly recommended by some to paint the part heavily with gum-water and to form a coating by dusting into this subnitrate of bismuth. Common white paint is also highly commended. A varnish, lasting the necessary length of time, is prepared by mixing into tinctures of iron and cinchona a sufficient quantity of sulphate of quinia to thicken the fluid. Carron oil, a remedy much used in Scotland, consists of lime-water and linseed oil in equal parts. Carded cotton is a common and valued domestic remedy. The new preparations of petroleum, vaseline and cosmoline, are coming into much favor for use in superficial scalds or burns. A soothing application is found in starch prepared as a poultice. Scrapings of potato, apples, and carrot are good remedies. Fresh-gathered plantain leaves furnish a very satisfactory dressing. Earth, in the form of dry powder, dusted over the part, is highly commended by Dr. Addinell Hewson. Cod-liver oil is a good although an offensive means. As an immediate application to relieve pain much commendation has been given from various sources to an admixture with water of the bicarbonate of soda.

Deep burns, implying eschar, or slough, are treated primarily as the previous class. Inflammatory disturbance being modified, secondary indications refer to anticipated loss of tissue. Parts entirely dead are wisely cut away; partly dead, being injured beyond possibility of restoration, poultices hasten a line of demarkation.