which has run in the hole in the lower part of the apparatus, and is to be tightened or loosened with an ordinary screw-driver. The chin-support was packed with cotton wool.

Fig. 5 represents the case after recovery.]

June 1, 1892.

Discussion.

Dr. John S. Marshall said he was interested in the splint, and that while it served its purpose admirably, he thought the better way to treat fractures of the inferior maxilla was to wire the parts firmly together with a silver wire, as the mouth is so much easier to keep clean than when a splint is worn. In such cases he dissects down the tissues till the edges of the bone are reached, the tissues and the periosteum being laid back. A drill is then passed through near the end of the bone, care being taken to avoid the roots of the teeth and the inferior dental canal. A silver wire is then passed through the holes in the ends of the bone, and the parts brought together. Two or more such sutures are made, and secured until the fractured parts are immovable. He has treated many such cases in this way without any bandages. No after-treatment is required except frequent washings with an antiseptic mouth-wash, for which he prefers Thiersch's solution, as follows:

Boric acid, 12 parts;
Salicylic acid, 4 parts;
Water, 1000 parts.

This is a good antiseptic: is not dangerous, nor unpleasant to the taste, only a little bitter.

He related the cases reported on pages 575-6 of the *Dental Cosmos* for 1892, and in reply to a question said it was usually necessary to leave the wires in place from four to eight weeks, the time depending upon circumstances. In nearly all cases suppuration will take place and retard the knitting of the bone.

Dr. Curtis said the results of the case reported by Dr. Fletcher are exceptionally good, and the splint is very well adapted to the class of injuries it was designed for. He thought in hospital cases the plaster bandage was perhaps as good as anything,—that is, where there are teeth in both sets; but before it was applied several layers of cotton should be placed under the chin whenever the bandage will come in contact, to lessen the liability of abscesses forming.

Dr. Marshall said that the evidence of all surgeons to whom he had talked upon the subject was that a splint of this character was always a failure where there was any displacement, and that the system of wiring was always used.

Dr. Allport said that he agreed with Dr. Marshall that wiring was better than any splint. He believed that he himself was the first man who used wire for this purpose. It was about thirty years ago, and he got good results. He related the case of a lady who fell from a step and broke each jaw in four pieces. He wired all the pieces in place, and the bones united perfectly, and the result was in every way satisfactory. He thought that oral surgeons were better able to handle such cases than the general surgeon.

Dr. Barrett reported a case of a boy who was run over by a heavy wagon in such a way as to crumble the lower jaw frightfully. He was brought to the city and put in the hands of a competent and skillful surgeon, who wired the pieces together by wire around the teeth. When the mouth was open the parts were kept in proper position, but when shut the jaw went away around to one side. Dr. Barrett, being called in consultation, found four physicians there, all of whom confessed that the injury was beyond their skill to repair, hence they had called him in as a specialist in these things. The boy had been under an anesthetic for most of the time for four hours.

Reasoning by exclusion, as there was no crepitation and no fixation, he concluded that there was no luxation, and no complete fractures that were not securely wired, and that there was only one possible cause for the condition: an incomplete or "green stick" fracture across the angle of the ramus. With the muscles relaxed the jaws fell directly down, but when the boy attempted to close his mouth the temporal and internal pterygoid, with some of the fibres of the masseter, not being counteracted on the other side, drew the jaw to one side, it bending or yielding at the point of the incomplete fracture.

The boy was taken to Dr. Barrett's office, and gutta-percha impressions taken of both jaws. The impressions were trimmed to the proper shape, and a notch cut in front

for feeding through, and the boy having been again anesthetized, the occluding surfaces of the gutta-percha impressions that were to serve as splints were warmed until they were adhesive, and placed upon the teeth; then by main force the jaw was carried to its proper place, the two gutta-percha splints stuck together, and the whole was fastened with a two-tailed bandage. The operation was a perfect success.

Dr. Fletcher said that though wiring was undoubtedly to be preferred in many cases, it was not admissible in such as he described, because in his case at least a quarter of an inch of the bone was lost by comminution, and to wire the bone together would make proper occlusion of the teeth impossible.

DISEASES OF THE GUMS.

Read in the Section of Oral and Dental Surgery, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY JOHN L. GISH, M.D., D.D.S.,
OF JACKSON, MICH.

It is not my purpose to try and cover the whole field of pathological conditions that would naturally come under the above heading, but simply take up such parts as are more common in our general work.

So far as the anatomy, histology and normal conditions of the gums are concerned, I will pass over that division, and not consume time by repeating that which we must know, in order to fully appreciate any abnormal conditions or changes that may take place in the gums.

When you deal with pathological conditions, let them exist wherever they may, in our body, we at once encounter the problems of growth and development, nutrition and assimilation. So here, when we find diseased conditions of the gums, we know that the laws that govern the process of growth and development, and the functions of nutrition and assimilation, have been changed to a greater or less extent, with the corresponding resultant of active or passive congestion, hypertrophied or atrophied conditions or increased cell growth of the tissues involved.

When we take up active or passive congestions or the acute and chronic inflammations of the gums we consider the type of cases that come to our notice more often, and cause more trouble to our patients, than is made manifest by the hypertrophied, atrophied and cell growth conditions combined. Under the section of acute inflammation of the gums, we have to contend with the acute or inflammatory oedema, marked by its rapidity of development, severe pain, tumefaction and great tension of the tissues, due to some chemical or traumatic lesion, and closely connected to this pathological condition, we do encounter gangrene of the mouth (or noma), which is less rapid in its development and attended with a less degree of pain, but far more destructive in its results, and much more obstinate in yielding to treatment. Under this division we may also include the acute catarrhal, herpetic and croupous inflammations.

Under division second, or passive congestions where the circulation is slowed in its course, affording an opportunity for the red blood corpuscles to accumulate in the arteries, and the white blood corpuscles to find their way into the veins, whose anatomical structure, viz.: their thin walls, affords an easy escape of the white blood corpuscles, by their amoeboid movements, into the surrounding structures, and at the same time with the passage of the white blood corpuscles, or leucocytes, there is also

the transudation of the liquor sanguinis, forming the serous effusion, which together with the leucocytes, dividing and multiplying, excite the tissues into cell-proliferation. This in turn causes a greater nutritive activity with the formation of a cell growth, which is very unstable in its composition and soon passes into retrogression, or the breaking down stage, with the formation of pus, which dissolves alike the alveolar process, the dental organs and the soft structure, thus completely destroying the involved tissues and ending a cycle of changes, only again to be renewed, and cause further destruction of the parts by continuity and contiguity, as is done in chronic catarrhal inflammations, phlegmonous and suppurative inflammations or abscesses, and fistulæ of the gums.

Under division three we will include hypertrophied and atrophied conditions, and under division four such cell growths as the fibrous, papillary, and vascular tumors and epitheliomata of the gums.

Division four including as it does, the variety of cases that come to our notice the least, have pathological conditions in common, varying only in the elements involved, and I cannot do as well in giving their pathology, as I can to repeat the words of Wedl, who regards papillomata of the gums as essentially localized hypertrophies of the papillary portion; generally associated with caries and located upon the facial surface of the gum; their diminutive conical elevations form dome-shaped enlargements and present an analogy with acuminate condylomata.

Fibromata of the gum occur in the submucous connective tissue in the form of projecting, superficially smooth, compact tubercles, which slope away towards the surrounding tissues; they are by no means of rare occurrence, especially those of smaller dimensions, and are composed of firm bundles of connective tissue with numerous interlacements, and imbedded cells. Linhart extirpated a fibroma of the submucous connective tissue nearly as large as a hen's egg.

Angiomata (vascular tumors) are of rare occurrence, and some give rise to hæmorrhage which endangers life. Salter reported a new-formation of this kind which was composed of numerous convoluted blood-vessels and connective tissue. The surface of the tumor, which was lobulated, located upon the neck of a tooth and as large as the berry of the common winter cherry, was covered with papillæ like those of the gum and with epithelium. The latter condition serves to indicate that the new-formation was seated in the submucous connective tissue of the gum and not, as alleged, in the dental periosteum.

Epithelial cancer sometimes occurs primarily in the gum and knotty elevations are developed, which increase in number and extent and spread to the submucous connective tissue, dental periosteum, alveolus and alveolar process. The epithelium undergoes notable proliferation and imparts a brighter color to the knots; it also dips down to a considerable depth into the substance, where the familiar rosette-shaped, nest-like groups of flattened, often distinctly ribbed cells are met with. Sometimes the papillæ of the gum also grow considerably in length and breadth, and the cancer acquires the appearance of a succulent wart which finally ulcerates. Schuh observed the origin of the epithelial cancer upon the buccal surface, usually in the vicinity of the last molars. Here also, he says, it maintains for a time the char-

acter of the broad cancer; that is, of a form of cancer which increases only in its extent of surface, not in depth, remains superficial, therefore, resembling a granulating surface, and slowly destroys the organic parts.

The hypertrophied and atrophied conditions, or division three of this paper, are more often met with than the conditions under division four, and of the two types of conditions under division three, the hypertrophied is far more common.

Atrophy, as the name implies, is a progressive and morbid diminution of the bulk of tissues of which the gum is composed. Atrophy is generally symptomatic, but it may be due to a local cause. Now inasmuch as atrophy from a pathological standpoint is just the reverse of hypertrophy, it will not be necessary to review its general pathology in order to state the changes that take place, but the general pathology of hypertrophy of the gums as given by Wedl, will serve the double purpose; hence, hypertrophy of the gums occurs frequently among the sequelæ of a chronic inflammatory condition of the root membrane following caries of the teeth, and is induced, also, by the irritation of the gums produced by the products of the degeneration of the hard tissues of the teeth.

The sharp edges of the stumps, too, which remain after the destruction of the coronal portions and necks of the teeth, become the sources of irritations.

The hypertrophy occurs both in the papillary portion and, beneath the latter, in the corium of the mucous membrane. When it occurs in the former, it is most conspicuous upon the facial surface of the gums and is confined to the region of one tooth or a few teeth, or acquires more extended limits in cases of caries involving the crowns or roots of several teeth.

The epithelium, also, participates in the hypertrophy which affects the papillary portion.

The secretion of mucous usually is increased in connection with papillary hypertrophy, and partial exfoliations of the epithelium occur, leaving superficial erosions. Bleeding readily occurs from the painless swellings, even from slight mechanical irritations. Sometimes the papillary portion is not involved and the proliferation is confined to the corium, occasioning a swelling of the gum, which has a smooth exterior. In these cases, which are more protracted, the cellular infiltrations rise to a tendinous connective tissue; in other words, the hypertrophic gum becomes sclerosed, and, consequently, it presents an increased power of resistance and a diminished succulency. The gradually obliterated papillary portion is covered by a common, thick, superficially smooth layer of epithelium. Notwithstanding the increased consistence of the corium, cellular-infiltrates are met with in the form of long chain-like rows or clusters, of ovoid cells, which are enclosed with a capsule of fibrous tissue. Since the periosteum, also, beneath the indurated gum is thickened, it is by no means strange that cross sections of the latter sometimes present slender trabeculae in the process of growth, together with young bone-corpuscles," while the above has given us the general pathology of hypertrophic conditions of the gums, there is yet another subdivision of this type of cases, that does come to our notice quite frequently and I mean the hypertrophied conditions of the tissues that often times surrounds, or accom-

panies the eruptions of the wisdom tooth. It is true that in this particular type of cases, we have a greater degree of pain, more swelling, and inflammatory action extending to the surrounding tissues, than is the case in true hypertrophy of the gums, but the difference in the exciting cause, will explain the difference in symptomatic results.

In true hypertrophy, usually the result of some chronic inflammation of a root membrane, or the irritation of the gums produced by the products of the degeneration of the hard tissues of the teeth, we have the train of symptoms or conditions as above given; but in this particular type of cases caused by undue pressure on the surrounding tissues, and still further augmented by the close relations of the parts, and the mechanical action of mastication we account for the difference in subjective symptoms.

In chronic catarrhal inflammation, included under division second, or passive congestions we find the mucous membrane thickened and of a rose color with white spots which appear and disappear with the exfoliation of the epithelium. The patient complains of unpleasant sensations such as burning, itching and tickling, and as a result of this congestion there is a grey mucilaginous, and at times a puriform secretion poured out upon the surface of the gums. Of course the degree of this inflammation is modified to a greater or less extent, according to the time that the lesion is allowed to run, and as to whether the patient is suffering from other systemic troubles, or from catarrhal inflammations of surrounding membranes.

Phlegmonous inflammation, is somewhat sudden in its onset, but is attended with but little or no fever. The congestion is confined to both the corium and submucous connective tissue, with ulcerations occurring in small, shallow, yellowish spots or in the form of one large phagedenic ulcer. If this ulceration is allowed to continue, we will have necrosis of the osseous substance, beneath. Recovery is very slow and the surrounding membrane is spongy, from infiltration of the liquor sanguinis, very sensitive and bleeds easily. This type of cases is common, and is found in the well nourished, as well as in those who have systemic complications.

Suppurative inflammation, is where the lesion has been such, as to cause the passive congestion to result in the formation of pus, this pus may find its way to an external opening, or it may undergo, resorption. If the exciting cause has been mechanical such as compression, contusion, or laceration, the recovery is speedy with suppuration, but if on the other hand the exciting cause is a deceased root membrane of a chronic character, and the irritant becomes extended to the gum a fistula is formed, which will continue to discharge its secretion, until the parts are made healthy within.

Again referring to division one, under which we consider inflammatory œdema, acute catarrhal, herpetic and croupous inflammations, there is in common the rapidity of onset, severe pain, tumefaction and sponginess of gums, attended with the unpleasant sensation of itching and burning, in addition to this, the herpetic inflammation is characterized by the formation of vesicles, which rupture and remain a superficial erosion healing without cicatrization; closely allied to the herpetic condition is the inflammatory affection of the gums, developed during the course of an acute exanthemata, such as scarlet fever, measles etc.

The croupous inflammation, not only has the subjective symptoms that attend all active congestions, but it is characterized by the greyish structureless membraniform exudation, which may be very easily detached. This exudation takes place very rapidly and as rapidly undergoes degeneration with the production of an offensive, sanious mass, which dips down between the gum and the tooth thus exciting the root membrane into an active congestion with the corresponding loosening of the tooth. If the action is not checked the alveolar process is destroyed, and the teeth are lost.

In considering the treatment of the above pathological conditions, it must be governed according to the nature and type of the case in hand. But to generalize, I will say that in treating division first, or active congestions, with the exception of those cases due to acute exanthemata, I have found in galvanic and faradic electricity my most valuable agent, and it is so valuable, from the fact that by the proper manipulation of this subtle agent, we can correct circulatory disturbances, promote absorption of the transudated fluids, and cause the secretions and excretions to be changed into their normal condition.

Take for instance a case of noma, destructive in its results, and obstinate to cure, here by an application of electro-chemical cauterization from the positive pole, we can arrest the superficial destruction of tissue, and produce a healthy restoration of the parts beneath.

In treating the passive congestions I can apply electricity with benefit, only to the chronic catarrhal inflammations, the other types of cases of the second division are treated according to the principles of good surgery.

In dealing with hypertrophies, fibrous tumors and epitheliomata the electro cautery has been my best and most successful remedy. In order to cope with the papillary and vascular tumors, the galvanic current has been my most potent agent.

THE CONDITION OF THE DENTINE IN PULPLESS TEETH.

Read in the Section of Oral and Dental Surgery, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY W. C. BARRETT, M.D., D.D.S.,
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I had promised the Secretary of this Section that I would prepare and read a paper at this meeting upon the "Condition of the Dentine in Pulpless Teeth." It was a subject upon which I had bestowed some thought, but with the literature of which I had not made myself thoroughly acquainted. I had read Prof. Miller's work on "The Microorganisms of the Human Mouth," and his communications to the various journals, notably *The Dental Cosmos*, but not with this special subject in mind. I had not collated his writings on this theme, and hence had not collated them. When this had been done, I was astonished at the thorough manner in which the ground had been covered. Had I examined my subject earlier, I should not have attempted an excursion in the field, but having engaged to present this paper, I will endeavor to redeem my promise, premising that I can do little save to call attention to the great work done by Prof. Miller in this direction, a work