condition. In an accustomed associated action, so to speak, each separate action gains in strength by the correct performance of the others; and by interfering with one part the performance of the other parts is weakened and rendered more difficult.

I think I have said enough to show that we should discard all those theories which would connect this malady with any local conditions of the muscles. Although they might satisfy the exigencies of certain isolated cases, that will not cover a more extended clinical picture of the disease, which from the lesser to the greater cases cover a wide area.

We may have cases of *malaise*, hemeralopia, unsteadiness of gait in the mine, and slight headache, with or without nystagmus, at one side of the picture. At the other we may have extensive nystagmus, inco-ordinate movements of the extremities, almost amounting to epilepsy, with inability to maintain the erect posture. Between the two come the ordinary cases, which are by far the most common, and from which most medical authorities have drawn their ideas of the malady. The reason why the cases at the extreme ends of the picture are comparatively rarely met is not far to seek. Miners are a long-suffering race, and they rarely complain until the earlier stage is passed, and a stage is reached which necessitates a cessation from labour. On the other hand this stage is rarely passed, because it causes so much inconvenience that the sufferers are usually discharged from the mine.

I will engage to find large numbers of miners still at work who are suffering from the first stage of the malady, and to produce any number of the more exaggerated forms by forcing them to continue their occupation when they have arrived at the medium stage. No one who has once examined one of these advanced cases would, I think, doubt that the disease has a central origin, and it will be my object to attempt to explain its symptoms on grounds which are in accordance with modern physiology and pathology.

I think I have said quite sufficient to show that the symptoms of the malady are of much more general character than is usually supposed. And I feel sure we must also look for its cause to some more general disturbance of the nervous system than the exhaustion of the functional centre of one set of muscles.

Although in the earlier part of my paper I pointed out that my own experience would not allow me to form any connection between the development of the disease and any one special position, cases occurring as frequently in those who work in a sitting, standing, or recumbent posture, I think we must look generally to the question of posture as being the chief cause or first link in the chain of all subsequent troubles.

Whether standing, sitting, or reclining, the relative position of the head to the trunk is almost invariably one of dorsal flexion. The hewer has to look in a position which is almost invariably above the horizontal meridian plane, and sometimes considerably so. In directing his gaze upwards, the muscles of the neck which are associated with this ocular movement draw the head forcibly backwards, and this effort will be greater in proportion to the necessity there may be to see clearly, for, in proportion as the gaze is directed above the horizontal meridian so does the difficulty of fixation and accommodation come into play, and by so much as the flexion of the head will reduce the necessity of the ocular movement, so will it be relieved of injurious or painful strain.

Flexion of the head relieves the eyes; they therefore flex the head to the greatest possible extent. Now if we examine into the anatomical construction of the parts which are concerned in these movements, we shall not be surprised that a continuation of them must be attended with very injurious effects upon the nervous system generally, but more especially certain parts of them.

In the first place, I think it is only reasonable to suppose that the vascular conditions will be considerably interfered with. As we are all aware, the brain derives its blood-supply from the two internal carotids and the vertebral arteries. Nature foresaw that at the junction of the skull with the spine the motion necessary for many purposes would interfere with the vascular supply to the brain, and she attempted to minimise their injurious effects by making a considerable degree of tortuosity in these vessels. Under ordinary movements no doubt this tortuosity compensates for the stretching the vessels are subjected to, but we can readily conceive that when this stretching is prolonged, it may not suffice. Or again, we can readily understand how changes, atheromatous or otherwise, in the coats of the vessels may interfere with their properly yielding under the influences of extreme flexion or extension.

Although these remarks apply generally to both carotid and vertebral arteries, it is obvious that the latter vessels are more particularly liable to this mechanical interruption; a glance at their anatomical relations is sufficient to indicate this.

My argument, then, is that the position in which the miner works is one which produces a condition of a certain extent of cerebral anemia generally, but chiefly of those parts which derive their supply from the basilar arteries. This area chiefly comprises the posterior or occipital lobes, which, by consent of the most competent localists, are now recognised as the highest visual centres. I think it will be fair inference, although I admit that to a certain extent it is speculative pathology, that the interference with the nutrition of the visual centres may be one of the chief features in the production of hemeralopia, a symptom which is almost invariably present in every case of miners' nystagmus.

But there are, I think, other mechanical causes which may play a not unimportant part in the production of this neurosis. If we glance at the anatomical relations of the tentorium cerebelli, we shall find that the free margin of its anterior extremity grasps the upper part of the pons just previous to the bifurcation of the crura cerebri fitting between the corpora quadrigemina and the superior cerebellar peduncles. Although under ordinary circumstances there is ample play at this tentorial ring, when the head is thrown far back, the edge of it advances somewhat forward, and it may be felt on the dead body to exert an amount of pressure upon these parts which must be injurious when long continued.

When we bear in mind that the cerebellum is probably the co-ordinating centre of all muscular action, and almost certainly for that of the eyes, and that the superior cerebellar peduncles are one if not the chief channel through which these co-ordinated impulses must pass to the visual organs, I think you will all admit that there are grounds for the hypothesis which I advance now in part as an explanation of the phenomena we observe. The obscurity and difficulties which surround all problems of cerebral and neural pathology are so great, even when we have the assistance of careful *post-mortem* examinations, that we can scarcely do more than speculate upon those lesions which, though in themselves productive of endless misery and trouble, rarely, or I may say never, lead to the termination of life.

LECTURES

CERTAIN DISEASES OF THE JAWS.

Delivered at the Royal College of Surgeons of England, June, 1887.

BY CHRISTOPHER HEATH, F.R.C.S.,
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LECTURE III.—DISEASES OF THE TEMPORO-MAXILLARY ARTICULATION AND CLOSURE OF THE JAWS.

[Concluded from page 60.]

CLOSURE OF THE JAWS may be conveniently divided into temporary or spasmodic, and permanent due to contracted cicatrices or ankylosis of the joint.

Spasmodic Closure of the Jaws, which may be of several weeks' duration, is almost invariably connected with the eruption of the wisdom-teeth of the lower jaw. Owing to want of room between the second molar and the ramus of the jaw, or owing to some malposition of the tooth itself, the wisdom tooth is unable to assume its normal position, and by the pressure which it exerts on the neighbouring structures, sets up irritation, which induces a state of tonic spasm of the masseter and internal pterygoid muscles. This fact has long been known to dental surgeons, and is especially alluded to by Mr. Salter in his essay on "Surgical Diseases connected with the Teeth."

Fig. 14.

The accompanying engraving (Fig. 14), for which I am indebted to Mr. Felix Weiss, shows the condition of parts found by him in a gentleman, aged 43, who suffered long and severely from pain and spasmodic closure of the jaws, due to the irritation caused by the wisdom-tooth lying imbedded horizontally in the alveolus, and pressing against the fang of the second molar. It was only after the extraction of the second molar that the wisdom-tooth was found and removed, with complete relief of the symptoms.

The majority of these cases occur about the age of 20, when the eruption of the wisdom-tooth is to be expected, and the diagnosis is readily made. The treatment is obvious. The mouth must be opened by a screw gag, or by a spiral screw wedge of boxwood, under chloroform, and either room must be made for the wisdom-tooth by extracting the second molar, or, if it can be reached, the wisdom-tooth itself may be removed.

The impeded eruption of wisdom-teeth gives rise to various and apparently anomalous symptoms, which are often not traced to their true source, such as persistent neuralgia, not always referred to the part involved; but the most serious result is the formation of abscesses, which burrow widely about the angle of the jaw and cheek, leading to great scarring and permanent deformity. In a young lady, seen by me in consultation some months back, the mischief resulting from an impacted wisdom-tooth was sufficient to put her life in some jeopardy, and has left her face permanently scarred by extensive abscesses.

Permanent Closure of the Jaws.—Cases of permanent closure of the jaw from cicatrices within the mouth, etc., are not of very rare occurrence; but their description and treatment seem to have been very generally neglected by modern English authors.

By far the most complete account of this affection is given by Dr. Samuel Gross, of Philadelphia, in his large work on surgery, from which I take the following quotation:

Ankylosis, or Immobility of the Jaw.—This distressing affection, which may be produced in a variety of ways, may exist in such a degree as to render the patient entirely unable to open his mouth or to masticate his food.

"The most common cause, according to my observation, is profuse pyralism, followed by gangrene of the cheeks, lips, and jaw, and the formation of firm, dense, unyielding, inextensible tissue, by which the lower jaw is closely and tightly pressed against the upper. Such an occurrence used to be extremely frequent in our south-western States during the prevalence of the calomel practice, as it was termed, but is now, fortunately, rapidly diminishing.

"Children of a delicate, strumous constitution, worn out by the conjoint influence of mercury and scarlatina, measles, or typhoid fever, are its most common victims; but I have also seen many cases of it in adults and elderly subjects. In the worst cases there is always extensive perforation of the cheeks, permitting a constant escape of the saliva, and inducing the most disgusting disfigurement.

"Secondly, the affection may depend upon the ankylosis of the temporo-maxillary joints, in consequence of injury, as a severe sprain or concussion, or arthritic inflammation, leading to a deposition of plastic matter, and the conversion of this substance into cellulose-fibrous, cartilaginous, or osseous tissue. I have met with quite a number of such cases, several in very young subjects.

"Thirdly, the immobility is occasioned by a kind of osseous bridge, extending from the lower to the upper jaw, or from the lower jaw to the temporal bone; such an occurrence, however, is not common, and is chiefly met with in persons who have suffered from chronic articular arthritis.

"Finally, mobility of the jaw may be caused by the pressure of a neighbouring tumour, especially if it occupies the parotid region, so as to make a direct impression upon the temporo-maxillary joint."

I must now refer to an essay by Dr. Frederic Esmarch, Professor of Surgery in the University of Kiel, on "The Treatment of Closure of the Jaws from Cicatrices," in which he investigates the pathology of the affection, and describes an operation for its relief by the formation of an artificial joint in the lower jaw—an operation which has given most satisfactory results in cases under my own treatment.

This proposal of Professor Esmarch to form a false joint in front of the cicatrix was suggested to him by a case which came under his care in 1854, in which considerable destruction of the cheek and contraction of the cicatrix had occurred, together with immobility of the lower jaw and necrosis of a portion of it. The necrosed portion was fortunately in front of the cicatrix. The bone having been removed, it was found that mobility was restored, and a useful amount of movement obtained. Professor Esmarch therefore suggested, at the Con-

gress of Göttingen, in 1855, the removal of a piece of bone in cases of contracted cicatrix; but did not happen to meet with a case suitable for the operation until after it had been successfully performed by Dr. Wilms, of Berlin, in 1853, shortly after which he himself operated upon at a case at Kiel, and with the best results. The operation was subsequently performed by Dittel, of Vienna, and by Wagner, of Königsberg.

Shortly after this proposal of Esmarch, it would appear that Professor Rizzoli, of Bologna, quite independently conceived a somewhat similar idea, but modified the proceeding by merely cutting through the jaw, without removing any portion of bone. He operated in this way first in 1857, and subsequently had three other successful cases. In Rizzoli's cases no external incision appears to have been made, but the section was accomplished from the mouth with powerful forceps. This proceeding has been followed by Professor Esterle, from whose essay in the *Annali Universali di Medicina* I have extracted these particulars.

Esmarch's operation appears to me to possess a decided advantage over that of Rizzoli, in the fact that a piece of bone is removed, by which the formation of a false joint is facilitated, as we know by experience in cases of resection of the elbow, etc.; and the external incision can never be a matter of any importance, whilst it admits of the application of the saw, and so avoids risk of splintering the bone.

Mr. Mitchell Henry was, I believe, the first surgeon to put Esmarch's operation into practice in this country, he having performed it a few weeks before myself. The patient was a female, on whom a variety of operations had been performed (among others, division of the masseter), and whom I had had under my own care at the St. George's and St. James's Dispensary, two years before, when I divided the cicatrices freely, and screwed the mouth open, but without permanent benefit. Mr. Henry employed the chain saw, and removed about half an inch of bone. The patient, unfortunately, sank a few days afterwards, apparently from pyæmia and exhaustion. In my own cases I used an ordinary narrow saw, in preference to the chain, and was enabled to remove sufficient bone to give free movement, through a small incision along the edge of the jaw.

The subject of the contraction of cicatrices in the mouth, and their treatment, though it has attracted little notice among British authors, has, on the contrary, excited much attention in Paris, and has furnished the topic of frequent discussions at the Société de Chirurgie. Since the date of the publication of a paper upon the subject by M. Verneuil (*Archives Générales*, 1860), several operations have been performed by French surgeons, but apparently with but little success, since in cases operated on both by the method of Esmarch and of Rizzoli reunion of the divided jaw has taken place.

Thus, on February 4th, 1863, M. Boinet brought before the Society a little girl on whom he had previously performed what he terms Esmarch's operation (but which appears to have consisted in the simple division of the jaw, recommended by Rizzoli, and not the removal of a wedge of bone, as originally proposed by Esmarch), and in whom the bone had reunited. M. Deguise thereupon quoted a case in which he had removed a centimètre and a half of bone with the same unsatisfactory result, and expressed a doubt whether a single successful case could be produced. On February 11th, 1863, M. Deguise brought the case he had alluded to before the Society, and showed that the failure "depended upon the formation of an osseous callus at the level of the resected portion." At the same meeting M. Bauchet showed a young Syrian girl in whom contraction of the left side had taken place, together with a loss of substance of the cheek and commissure of the lips, equalling a five-franc piece in size. In this case a centimètre and a half of the jaw was removed; and though extensive suppuration and necrosis of the jaw ensued, the girl made a good recovery, and at that date (February 4th) a very satisfactory amount of movement and power of mastication had been obtained.

On July 29th, 1864, M. Verneuil communicated to the Société de Chirurgie the histories of several cases operated upon by M. Rizzoli himself, the results of which were most satisfactory. In the first the operation (simple division of the jaw from within the mouth) was performed in 1857, and after six years the boy was able to eat solid food most satisfactorily; the second case, operated upon in the same year, was equally good. In the third case, operated upon in 1858, the mouth could not be widely opened, and the child had some difficulty in speaking. The fourth case, operated upon in 1860, was most satisfactory. M. Verneuil also mentioned a fatal case which occurred in M. Rizzoli's practice, and alluded to my paper in the *Dublin Quarterly Journal* of May, 1863.

It would appear that M. Rizzoli had adopted the plan of inserting a foreign body, such as a piece of gutta-percha, between the cut surfaces of bone, with the view of preventing their reunion, and the pos-

¹ Die Behandlung der narbigen Kieferklemme durch Bildung eines künstlichen Gelenkes am Unterkiefer. Kiel, 1860.

sibility of doing this was roundly denied by one of the speakers at the Société de Chirurgie. There appears to me, however, to be no difficulty in effecting this, provided the section be made from within the mouth and without external incision, as proposed by M. Rizzoli, but I cannot speak with certainty, having no experience of his operation.

One observation of M. Verneuil's is, I think, worthy of special notice—namely, that all Rizzoli's successful cases have been examples of contraction within the mouth without loss of substance of the cheek, whereas the unsuccessful cases of the operation which had occurred in Paris had suffered considerable damage in the soft tissues; and he suggests that in these cases Esmarch's operation may be more properly applicable. In one of my cases the loss of substance in the cheek had been replaced by a dense cicatrix, which it would have been unwise to interfere with from within the mouth, and at the same time, owing to its firm contraction, it would have been impossible to have performed Rizzoli's operation in the way he recommends—namely, without any external incision. I therefore resorted to Esmarch's proceeding, with the results of which I have every reason to be satisfied.

The first case in which I performed Esmarch's operation was in a boy aged 15, who was sent to me by Mr. Martin, of Portsmouth, in

Fig. 15.

1862, with complete closure of the jaws, the result of the contraction of cicatrices within the mouth following extensive necrosis. The cicatrices had been divided, and his mouth screwed open in 1856, but without permanent benefit, and he obtained his food by rubbing it between his teeth, or by putting it through an aperture between the teeth on the right side. The mouth was firmly closed, the teeth overlapping; there was a cicatrix at the right angle of the mouth, and a dense band could be felt within the mouth on the same side. Fig. 15

Fig. 16.

shows his condition on admission. I made an incision two inches long upon the lower border of the jaw, in front of the right masseter, and removed a wedge of bone measuring rather more than a quarter of an inch along the upper, and half an inch along the lower border. The piece contained the mental foramen. The mouth could now be freely opened, and the boy was discharged at the end of a month, able to open his mouth, as seen in Fig. 16; the distance between the teeth being seven-eighths of an inch.

The second case in which I operated in the same manner was complicated by the presence of a dense cicatrix, occupying nearly the whole of the cheek of the affected side. The angle of the mouth had also given way during a recent attack of fever, and the patient presented the unsightly appearance shown in Fig. 17. The patient was

Fig. 17.

aged 23, and the sloughing and contraction occurred at the age of 6. She was sent to me by Mr. Bullen, of the Lambeth Infirmary, in January, 1864. I made an incision along the border of the jaw, and, as in the former case, removed a wedge of bone measuring seven-eighths of an inch along its lower border. This also contained the mental foramen. The patient's mouth could now be opened to the extent of half an inch. I made two subsequent attempts to remove the deformity of the cheek by plastic operations, but only succeeded in restoring the commissure of the lips, the vitality of the cicatricial tissue being too low to admit of its uniting with other tissues. At the time of her discharge the commissure of the lip was half an inch in breadth; and with a piece of plaster over the opening which was left behind it, the patient was very comfortable. Fig. 18 shows her condition at this time with the mouth open.

Fig. 18.

With regard to the permanence of the relief afforded in these cases, I may mention that B. B., the boy on whom I operated in July, 1862, continues in perfect health, and able to take plenty of nourish-

ment, although the movements of the jaw have very decidedly diminished, owing, apparently, to contraction of the fibrous tissues around the new joint, due, as the patient and his mother believe, in the first instance, to the cold of the severe winter following the operation, from which he suffered considerably.

In March, 1865, I had the boy up from the country, and found that the space between the left molar teeth had diminished from seven-eighths to one-eighth of an inch, and that between the left lateral incisors, from five-eighths to a quarter of an inch. The movement was still free enough to show that osseous ankylosis had not taken place in the new joint; but whether the contraction was due simply to changes at that point or to the contraction of some band it was impossible to determine, as the boy positively refused all interference, either with or without chloroform. In this case, however, I believe that I was not sufficiently careful to make the section of the bone entirely in front of the cicatrices, a point I bore in mind in the second operation.

The second patient, E. J., is in perfect health, and has good use of her jaw. I saw her at Plymouth, in April of this year, in good health, and with perfect movement of the joint. The opening in the cheek remained the same.

In 1883, I again performed the operation in University College Hospital, on a woman, aged 32, who was kicked by a horse on the right side of the face, when 11 years of age, since which she had had more or less closure of the jaws. The teeth were firmly closed, the lower incisors being forced outwards. It was clearly a case of ankylosis of the temporo-maxillary articulation, and I should have preferred to operate in that region, but for the patient's anxiety to be relieved as soon as possible, in order to return to her family. She recovered, with good use of the jaw.

In connection with this subject, and to show the pathological result of the proceeding, I may refer to the following account of the *post-mortem* examination of a case of Esmarch's operation, read before the Société Impériale de Chirurgie, September 5th, 1866. M. Boinet showed the lower jaw of a girl who had closure of the jaws, from cicatrices resulting from cancerum oris. Rizzoli's operation had been performed at the beginning of 1860, but failed at the end of twelve months. In 1863 a wedge was removed with perfect success. She died of phthisis in 1866.

"The right ramus of the jaw is deformed, being shorter and broader than on the opposite side. The condyle and the coronoid process are less separated and shorter than on the left side, and the sigmoid notch is shallower. The left temporo-maxillary articulation has lost much of its mobility, and the ligaments are shortened. The sections had been made in the middle of the body of the bone, the angle being intact. The lower border of the jaw presents a difference in length of one centimètre and a half between the two sides, which corresponds to the breadth of the wedge of bone removed at the operation. The osseous tissue of the ascending ramus appeared reddened; the dental nerve was natural at its entry into the inferior dental foramen. Between the two portions of the jaw there exists a very complete false joint, which is permanent three years after the operation; it is very mobile, and the parts which serve as the hinge are fibrous and stretched so that the middle portion of the jaw can fall; during life this was sufficient to allow easily the introduction of the forefinger into the mouth. The fibrous tissue which unites the bones occupies the whole interval left between the bones, and extends for the whole depth of the jaw. Its breadth appears to be quite half a centimètre, and its strength uniform."—*Gazette Hebdomadaire*, October 12th, 1866.

In a few cases of bilateral ankylosis it has been thought advisable to perform Esmarch's operation on both sides of the jaw. Thus, Dr. Maas, of Breslau, relates in the *Archiv für Klin. Chirurg.* (Band xiii, Heft 3) the case of a man, aged 27, who was admitted into hospital with ankylosis of the jaw on both sides. It had come on after an attack of scarlet fever when he was seven years old, being preceded by severe pain in the part; and since the age of ten he had not been able to move the jaw at all. The secondary dentition was attended with great difficulty in the removal of the milk teeth; and the new teeth were irregularly developed, and for the most part were displaced laterally. The patient, on admission, was of anæmic appearance, though in moderately good condition; the lower jaw was imperfectly developed. Speech was somewhat muffled, but was quite intelligible. Not the least movement of the jaw could be produced under anæsthesia. Herr Middeldorpf operated on the right side, removing a wedge-shaped piece of bone, as recommended by Esmarch, near the angle. The result of this was the formation of a false joint, with power of opening the mouth passively to the extent of about an inch. Between four and five months later, Dr. Fischer performed

a similar operation on the left side; four months after this, the patient could voluntarily open his mouth without pain to the extent of about an inch and a quarter, and his general condition was much improved.

The treatment of cicatricial contraction within the mouth by simple division has been proved over and over again to be worse than useless. The difficulties experienced in these cases, and the failures which so often accompany the methods employed, induced Dr. Ewing Mears, of Philadelphia, to make an effort to effect division of the dense tissue by means of a ligature, believing that reunion could thus be partially, if not completely, prevented.

Having armed a strong-handled needle with a double-twisted, carbolised silk ligature, Dr. Mears passed it from the angle of the mouth backward between the integument and the outer surface of the cicatricial mass, and caused the point to emerge just behind the last molar tooth of the lower jaw. In this manner he surrounded the cicatricial tissue with the ligature, which was tied loosely and moved each day for a week, so as to establish a canal which would not readily close. At the expiration of a week, Dr. Mears tightened the ligature slightly, and every third day for the next two weeks made slight torsion, passing a probe meanwhile along the track of the ligature. In this way the dense tissue was slowly divided, union not taking place at the bottom of the wound, and the jaws were separated three-quarters of an inch, sufficient for all practical purposes. The patient went to his home in the country, and four months later returned.

When suitable apparatus is adapted to the jaws, so as to prevent re-contraction, a very good result may, with patience, be produced in cases uncomplicated by destruction of the cheek itself. Fig. 19 shows a sketch of the mouth of a woman who had cicatricial

Fig. 19.

bands on each side, binding the cheeks and gums together so that she was able only to separate the lips, and in whom division of the cicatrices had been practised in childhood. The lower jaw was edentulous, but the upper front teeth remained, and Mr. Felix Weiss succeeded in adapting a small lower denture so as to antagonise the upper teeth and prevent the further contraction which appeared imminent, at the same time greatly improving the patient's power of articulation (*British Journal of Dental Science*, May, 1880).

The great drawback to treatment by division of bands, and one with regard to which it contrasts unfavourably with Esmarch's proceeding, is the amount of pain which the patient must of necessity undergo during the after-treatment. It requires no small amount of courage on the part of the patient, and some determination on the part of the attendant, to carry out the necessary manipulations within the mouth, more particularly during the first few days after the operation; and even after the shields are fitted to the mouth, they cause some pain and inconvenience, which only those who have arrived at years of discretion will submit to.

Fig. 20 shows the form of the silver "shields" adapted to the upper and lower jaws by the late Mr. Clendon, formerly dental surgeon to the Westminster Hospital, in a case of Mr. Barnard Holt's. The patient was a girl aged 17, and was under Mr. Holt's care in 1862, having five years before had fever, with an abscess of the cheek on the right side, which led to such contraction and adhesion of the mucous membrane to the jaw as to cause great difficulty in opening the mouth. Some attempts had been made to open her mouth by the screw, etc.,

and in 1860 Mr. Holt divided some of the cicatrix with temporary benefit. Mr. Holt now divided the cicatrix within the cheek freely under chloroform, and encountered a firm plate of bone extending between the alveoli of the two jaws, which necessitated the use of a saw for its division. Mr. Clendon subsequently fitted the above-men-

Fig. 20.

tioned shields to the teeth, and wedges were gradually introduced between them to separate the jaws. This treatment was continued for three months, when she was able to open the mouth to the full extent, as seen in Fig. 21.

Fig. 21.

The effect of the use of shields seems to have been not merely to prevent adhesions between the inside of the cheek and the alveolus, but to re-establish, to a great extent, the sulcus of mucous membrane at the base of the alveolus, upon which so much stress is laid by Professor Esmarch. Surgical experience in cases of ruptured perineum, etc., shows how soon mucous membrane is reproduced where it has once existed, or even appears on adjacent parts where its presence gives rise to inconvenience; and there can be no question that in this case the mucous lining of the cheek has been reproduced to a great extent, and particularly near the lower alveolus. Esmarch's theory, that there must be some portion of old mucous membrane remaining which afterwards becomes stretched, is certainly untenable as regards this case at least, for without doubt the whole lining of the cheek and the outside of the alveoli were perfectly raw, owing to the division of the firm cicatrices.

The cause of non-success in former attempts at mechanical appliances is to be found, I think, in the fact that they have all been directed simply to keeping the jaws apart, without any reference to the re-establishment of the mucous lining of the cheek, upon which, as Professor Esmarch says, the movements of the jaw so much depend. That the success in the foregoing case depended upon this is proved, I think, by the existence of a firm band in the cheek which would effectually control all movement were its extremities attached to the two alveoli; but as it is, it gives no inconvenience, and will in all probability atrophy in the course of time.

At the Odontological Society, in June, 1864, Mr. Cartwright narrated a very similar case of contraction (with the exception that there was no bony bridge between the alveoli) in a woman, aged 38, which he successfully treated by similar means, using wedges of vulcanised india-rubber affixed to the shields to obtain the necessary distension.

The occurrence of an osseous lamella or bridge between the two jaws is a rare but not unique occurrence. In the *Medical Gazette* of July

4th, 1845, Mr. J. G. French has reported and figured an excellent example of ankylosis produced by a bridge of bone, which occurred under his care at the St. James's Infirmary.

The patient was 22 at the time of his death, and the closure of the jaws dated from infancy. He was fed through an aperture made by the removal of the incisors on the left side. At the age of 14, an operation for his benefit had been undertaken by an eminent surgeon, and incisions in the mouth had been made with this object, but without any good result. On *post-mortem* examination, the jaws were perfectly united on the left side, and only the smallest degree of motion was possible on the right; the soft parts were removed and the base of the skull was macerated, when ankylosis was discovered to exist between the upper and lower jaws on the left side, the ramus of the inferior maxilla, immediately internal to the mental foramen, extending upwards by a broad thin plate, and uniting with a corresponding plate of the superior maxilla, a cartilaginous material forming the bond of union. The articulation of the jaw was normal.

Mr. Trueman also mentioned in the discussion which followed the narration of Mr. Cartwright's case (*British Journal of Dental Science*, June, 1864) that he remembered seeing in the Museum at Berlin a very curious case where cicatrices existed on both sides of the mouth, which were completely ossified, so that the preparation showed the two jaws united by filaments of bone, on either side of the jaw externally.

Subsequently to Mr. Holt's case, I had under my care a patient with a very severe form of contraction, namely, on both sides of the mouth. The patient was 18, and the contraction dated from her fifth year, when she had fever. Various attempts had been made to give her relief by dividing the cicatrices and using wedges, etc., without benefit; and when she came under my care she had no power of separating the jaws at all, and the cheeks were firmly attached to the alveoli from the angles of the mouth. Having secured Mr. Clendon's co-operation, I freely divided the cicatrices, and after repeated trials that gentleman succeeded in fitting in shields resembling those used in Mr. Holt's case, but reaching over both sides. It was found necessary to extract all the teeth, and after more than three months' assiduous care and frequent modification of the shields, the patient being constantly placed under the influence of chloroform for the purpose, a very satisfactory result was obtained, there being exactly one inch between the metal shields in the incisive region, which would have left about half an inch if the teeth had been *in situ*.

Having thus shown that closure of the jaws depends upon various causes, and is amenable to various methods of treatment, of which I have had personal experience, I think I may venture to contrast these methods.

In cases of cicatrix, I give the preference to Esmarch's method of removing a wedge from the lower jaw on one or both sides. The operation is a comparatively easy one, and in cases where only one side of the jaw is affected, restores the patient a very useful though one-sided amount of masticatory power in two or three weeks, and with very little suffering or annoyance.

In cases of fibrous ankylosis of the temporo-maxillary joint, it may be worth while to try division of the adhesions, and, failing that, to resect the condyle.

In cases of bony ankylosis of the joint, division of the ramus of the jaw beneath the masseter appears to me the least dangerous and most satisfactory proceeding.

A FATAL SUPERSTITION.—A superstition hardly credible in these enlightened days has been attended with fatal consequences to a man named Ryder, at Cornwood, a Devonshire village. The deceased, when in the act of sharpening his scythe, severed two of the arteries of the wrist, and instead of procuring medical assistance sent for a man and his wife who have a local reputation as "charmers," and these people endeavoured to stop the bleeding by the ceremony of "charming." Ryder, seeing how fruitless were these efforts, begged to be taken to the hospital at Plymouth, about eight miles off, and was removed in a trap for that purpose, but he lost so much blood on the road that it was deemed advisable to convey him to Plymouth workhouse, where he died shortly after his admission.

An address of congratulation from the governors of the Middlesex Hospital was presented to the Queen on July 8th by Field-Marshal H. R. H. the Duke of Cambridge.

SIMPLY SEWAGE.—It was reported by the medical officer, at a recent meeting of the Rural Sanitary Authority at Appleby, that the inhabitants had no water for drinking purposes but what he described as simply sewage, and what on analysis was shown to contain over 80 per cent. of impure and offensive matter.