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ON THE

TREATMENT

OF

CLEFT PALATE.

BY

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ON THE TREATMENT OF CLEFT PALATE.

It is not my intention here to speak of the history of the various operations for the varieties of this deformity, as these have been already sufficiently made known; nor do I wish to mention anything except my own experience of the treatment of the condition, with the single exception that I should like to draw attention to two circumstances in connection with its etiology. These are, first, that the deformity seems to be endemic in some localities, cases occurring with extraordinary frequency; while in others it is absolutely unknown.¹ This seems to be the case in different districts in Yorkshire. Secondly the deformity is, invariably in my experience, hereditary. I have never yet seen a patient with cleft palate in whose family, if the family history is known for any distance back, it has not occurred before. Very frequently in the same family of children two or three will have different varieties of cleft. The deformity is often atavic, and I have known it to miss as many as three generations. I mention these facts because I believe they are not sufficiently known, and are not mentioned by the authors I have read.

The most frequent variety of intermaxillary cleft is the simple unilateral harelip. The mesial cleft lip is so rare, that only two specimens are known to exist. The bilateral cleft is, as far as surgical proceeding is concerned, practically the same as the unilateral, save when the premaxillary bones project from the end of the vomer, In this case the operation must be performed at two sittings, the first consisting of the division of the bony attachment of the displaced bones, the paring of their edges and of the corresponding edges of the maxilla, and the insertion of the premaxillaries into the cleft. This has in my hands always been successful. For the after part of the operation, for the union of the lip, a variety of operative measures have been recommended, and most of them I have tried without having found that any of them are, in their results, in the least superior to the old-fashioned incision straight through the lip with a slight deviation inwards at the bottom, to form a prolabium, with the removal of plenty of tissue. I have seen very disappointing results when a thin shred of tissue has been removed.

¹ I understand that nearly all the lion cubs born in the Regent's Park Gardens have cleft palate, and that this is not known to occur in other collections.

There is one very objectionable result of the operation for hare-lip which I have endeavoured to obviate, and I believe successfully. I mean the scars left by the needles when used transversely to close the wound. The only difficulty about the operation is with regard to the time during which needles so employed ought to be retained. If removed too soon, the wound is torn open; if removed after the second day, hideous and ineradicable scars are produced.

To avoid these scars I use ordinary sempstress's needles, strong and threaded with a few inches of silver wire double. I introduce each needle through the lip (in the plane of its surfaces), about half an inch from the prolabium, and bring the point out at the middle of the cut surface. I then introduce the needle at the corresponding point of the opposite cut surface, and again bring it out at the root of the ala of the nose. Thus, when both needles are *in situ* they form a St. Andrew's cross, the point of intersection being in the centre of the wound. The needles are then pushed home up to their eyes, the wires twisted firmly together, the points cut off close to the skin, and the stumps retracted into it. Thus all possible scarring is avoided, save on the mucous surface of the lip, where it cannot be much noticed. I have a modification of this plan to secure a prominent prolabium, but I cannot by description render it very intelligible. The wires are made by it to pass through the prolabium instead of over it.

The next most common variety of intermaxillary cleft is that involving the soft palate, and from a third to two thirds of the hard palate, sometimes with, but more frequently without, harelip. Next in order of frequency is the complete cleft, and least frequent is the simple cleft of the soft palate, with which I have only twice met. It is, perhaps, not strictly correct to include all these varieties under the term *intermaxillary cleft*; but as this is the best name for the complete cleft, and as all the others are but modifications of it in their origins, and in the treatment I propose differ but very slightly, I find it the best term to use for all.

In detailing the method of treatment which I have pursued in cases of complete intermaxillary cleft I shall, with very few exceptions, give all the details necessary for clefts of more limited extent. I must first of all, however, take exception to a statement by my friend Mr. Thomas Smith, in his paper in the fifty-first volume of the 'Medico-Chirurgical Transactions,' to the effect that Sir William Fergusson has brought nearly to perfection the operation for cure of the soft palate by division of the muscles, and that almost as much has been done for the hard palate, so that there is "as little room as need of improvement in the *modus operandi* for the cure of these deformities."

I think it premature to say so much when we know very well that at least half of the children born with extensive clefts die within a few days after birth, from starvation; and when we know also that the

improvement effected in speech by the majority of the successful operations is very trifling indeed, and that these successful operations are a small minority of those attempted.

Most unquestionably the greatest step in the development of the operation was the conception of Mason Warren of shifting the muco-periosteum for the purpose of forming a hard palate,¹ or at least an anterior palate. The next step in importance was the successful performance of the operation in infancy by Billroth; and after this the demonstration, I believe by Mr. Thomas Smith, that chloroform can and ought to be used.

The proposal of Sir William Fergusson to divide the muscles was brilliant and ingenious, and when performed in his way certainly effective enough in rendering the flaps passive; but the result has not, in my experience, been any improvement in the voice when the operation has been successful, nor has the operation always resulted in the closure of the cleft, either in my hands, or under the more skilful manipulation of one of Sir William's most able pupils, recently deceased; nor, I understand, does it always succeed, even in the hands of that most expert of British surgeons, the distinguished deviser of the process. After the division of the muscles and contiguous structures by the method alluded to, and also by that of Mr. Pollock, and when the operation has been successful, I have seen the flaps of the soft palate atrophy and almost disappear in less than six months. Fergusson's operation, moreover, is one which I think no one without Sir William's own consummate dexterity would venture to perform on an infant, and the same may be said of Pollock's; and unless we can close the cleft of the soft palate in infancy it will be of little use to attempt it. Finally, Mr. Annandale's cases and my own show that the operation may be performed with the most perfect success without the division of any muscle. I believe I have discovered the reason why a very great number of operations are unsuccessful, and that I have overcome the difficulties. To these I shall again allude.

The success Billroth had in a child aged twenty-eight weeks was due, I am convinced, to his performance of the operation at three sittings. In complete cleft I never do it in less than two, and I am quite certain that many operations are unsuccessful because too much is attempted at once. Experience has taught me that the cleft of the hard palate ought to be closed first, and then that of the lip and soft palate at another operation, not earlier than three weeks after the first.² The reasons for this order are that the anterior

¹ 'New England Quarterly Journal of Medicine and Surgery,' April, 1843.

² My reason for delaying the operation on the lip is that if the lip should require to be lifted from the subjacent textures, as it frequently does, its removal will interfere with the nutrition of the flap of the anterior palate; and if the operation on the lip is not successful that on the palate is still less likely to be.

palate is of the utmost importance in deglutition, and its formation is the easiest and most certain part of the process. Indeed, I have only once failed in getting it closed, and that was in a case where I did the whole cleft at one sitting, and the whole reopened. A child can feed very well with a cleft lip and a cleft in the posterior palate, so that if the hard palate is closed *immediately after birth*, as I propose in future to do, the operation may be completed at any time within the next six months. I perform this preliminary operation as follows:—With an ordinary scalpel I make an incision not more than three quarters of an inch long, as close as possible to the alveolar processes immediately behind the spot at which will appear (or have already appeared) the canine and premolar teeth; another along the edge of the cleft, nearly as far as the posterior internal angle of the horizontal plate of the palate bone. If one or both of the walls are vertical, I make the inner incision far enough up to allow sufficient breadth of flap to drop down, and in this case I make the incision extend rather further back than if the palate plates are horizontal. Then passing the raspatory proper to the side (D or E in plate)¹ through the incision near the teeth, I lift the mucoperiosteum carefully off the bone, coming close behind the incisor teeth (or where they will be). If the raspatory figured be used, and it be properly made, there is little fear of injuring the anterior palatine arteries. I have repeatedly performed the operation on the dead body, and have always found that with this instrument, even in the foetus, the vessels are pulled slightly out of their canals, but never torn. Having lifted the flap at the anterior part, it must be cleared as far as the internal incision, care being taken not to go near the posterior palatine arteries. Generally the arch is high, and it will be found that flaps so formed will fall into their positions, but sometimes more traction will be required than would be safe to secure the closure of the aperture, and in such a case the external incision must be carried further back; it must be borne in mind that to do this safely the incision must be made actually *on the alveolar processes* external to the artery. I know an instance where an almost fatal hæmorrhage occurred from the division of a posterior palatine artery. Great care must be taken not to tear the internal edges of the flaps, and if they are not quite free the knife must be used.

I may here say all that is needful about the stitches. In the first place, it is more prudent to put too many in than too few; for if there be any point where the flaps do not come together, especially in the soft palate, the chances of the success of the operation are very much lessened, and it is no easy matter to put in an extra stitch after the others are *in situ*. I use silver wire always, and introduce it directly with the greatest ease, by the use of the two needles figured

¹ The figures in the plate are reduced about one-third in size.

(B and C in the plate), using them together. One is a fine tubular needle, carrying the wire, and generally held in the right hand. Both flaps are transfixed at the same moment for one stitch, thus securing that the points are exactly opposite. The wire projecting from the tubular needle is at once caught by the notch of the other, and brought out. The insertion of a stitch always, except in the uvula, takes me less time to do than to tell how it is done. I insert the stitches in order from before backwards, and close them in the same order, and am thus enabled to see exactly the effect of each step in the process, and to remedy any mistake, without having to undo work which is not faulty. There is also the advantage in this plan, in opposition to that recommended by Mr. Smith, that there is no risk of the posterior stitches being dragged out by the separation of the flaps during the operation, if they are supported by those already closed anteriorly. It is not long since I witnessed the operation done by a distinguished but not very self-possessed surgeon, who put in the stitch in the uvula—by far the most difficult part of the operation—twice, and twice it was torn out because it was unsupported, and the patient was not under chloroform. If the patient is in a conscious state the dragging is very great, and the absence of anæsthesia has contributed greatly to the want of success of the operations attempted.

I have figured (F) a little double hook which is very useful in arranging the wires, and in passing stitches where there is any peculiar difficulty; the other (G) is useful sometimes in putting on the stitch a point where a little further division by the knife is required.

I never remove the stitches until the fourteenth day.

Having succeeded in closing the anterior palate, it is advisable to wait some time, at least three weeks, to allow the new vascular connections to be well established; and in relation to the statements that bone is developed in the transposed flaps, I may say that I have now five cases where its presence can be determined.

At the second sitting the harelip and posterior cleft may be closed. What I have to say in reference to this second operation on the palate applies equally to all cases where the cleft is limited to the soft palate and posterior third of the hard. There are many cases, however, where the cleft extends far forward, which it will be much safer to treat as if they were complete clefts, and perform two separate operations on them.

Let me here say that while the patient is under chloroform I have found no difficulty in keeping the mouth open by an intelligent assistant using no more complicated apparatus than a strong silver spoon. I seldom have had more than two assistants; frequently, and in some of my most successful cases, I have had only one, as in the case where my friend Dr. Atkinson both administered the

chloroform and kept the mouth open. I have long since discarded all gags, and I have an especial objection to such complicated and expensive, though extremely ingenious, mechanism as the gag devised by Mr. Thomas Smith. It is not long since it was broken during the operation by the patient of another surgeon in my presence.

It is confessedly in the treatment of the cleft of the posterior or soft palate that the great difficulties exist in the way of success, and the greatest of these difficulties is a tendency to separation of the flaps. To obviate this we have the various plans for dividing the muscles, and for lateral incisions to relieve tension. The earliest attempt of this kind is one, unfortunately not published, which I have found in the private note-book of my friend Mr. Nunneley, and of so early a date as October, 1841. The case was not, however, successful, apparently owing to the starvation of the patient. The anterior pillar was divided, and the proceeding generally was similar to that recommended in 1843 by Dr. Mason Warren, and recently revived by Mr. Francis Mason. One point noted in Mr. Nunneley's case I wish to draw special attention to, namely, that the only tension seemed to be at the upper suture, opposite the junction of the hard and soft palates. Nearly every author who has written on this subject has noticed this, and all allude to some of their cases having been quite successful, with the exception of a small aperture at this point. My late lamented friend Maurice Collis especially points out this; he says, "Where the hard and soft palates meet there is, as a rule, such deficiency of bone, from the angles being rounded off, as to make it almost impossible to complete the closing of the fissure when the operation is taken at two times. At least one may esteem himself fortunate if there is not a pin-hole or something larger at this spot, which will only close after repeated touches of caustic or tincture of cantharides."¹ In the unsuccessful cases which I have seen in the practice of others and in those which I have had myself, I have observed that, with only a single exception, the separation of the flaps has begun at this point; in fact they very seldom meet at this part, at least in my own cases the flaps did not meet until I had employed the means I shall shortly describe. This point of separation seemed to be the great cause of non-success; for often, after union was satisfactorily completed everywhere else, I have seen ulceration spread from this point slowly along the line of union until everything was undone.

I have never been fortunate enough to get a cleft palate to dissect; but in order to discover the cause of this separation I did what was next best—I made some intermaxillary clefts on the subject, performed the operation, and then dissected the specimens. I soon dis-

¹ 'Dublin Journal of Quarterly Science,' 1865. Warren and Pollock also refer to this fact.

covered that the cause of the want of union at the point spoken of was the peculiarity of insertion of tendon of the tensor palati, or what I propose to call the circumflex fascia (shown diagrammatically at A). This peculiarity is well enough known to anatomists, but its practical importance in the operation of staphyloraphy has been quite overlooked, and what I believe to be an important physiological function belonging to it has been equally missed. After passing round the hamular process, the tendon of the tensor palati, in the normal palate, forms a tough, glistening expansion, which is inserted partly into the lunette of the posterior edge of the horizontal plate of the palate bone, partly into the posterior internal angle of that bone, and the remainder of the fibres are interwoven with those corresponding of the opposite side, and form a fascia of about three eighths of an inch wide in the mesial line. When both muscles are drawn tight this fascia may be felt under the mucous membrane, presenting a distinct edge, and I have little doubt that this fascia and its muscles exert an important influence in the modulations of the voice, acting by increasing the length of the hard palate.

The muscles which Sir William Fergusson divides are the *levator palati*, *palato-pharyngeus*, and occasionally the *palato-glossus*. It is with great hesitation that I venture to say that I think the division of any of these muscles unnecessary, with the exception, perhaps, of the last, which is occasionally necessarily divided along with the whole of the anterior pillar, to give more freedom to the flap. I think, however, that I may say this, because since the first case of the kind, operated on by Le Mounier and recorded by Velpeau, many others have been operated on successfully without the division of any muscles. My own cases also have satisfied me that the division of muscles is not only unnecessary, but actually injurious to the after results. Mr. Skey has written, "But while using the knife so extensively (as to divide these muscles), it must be borne in mind that every application of it cuts off a proportionate supply of blood, and thus interferes with the union of the flaps. This important fact has hitherto been overlooked. May not some of the untoward results be dependent on this cause?" I have already said that this proceeding has, in my experience, resulted in atrophy of the flaps after complete union.

My dissections lead me to believe that the *levator palati* has very little effect as a separating agent. Its action is almost directly backwards and upwards, and it may be that its division may rather tend to endanger the recently united flaps by preventing their elevation during the act of swallowing.

In Mr. Pollock's operation the tendon of the *tensor palati* is almost certain to be divided, but in that of Sir W. Fergusson's I think it cannot be. It serves, however, no good purpose to divide it, because the amount of action of the muscle is very limited. The

real source of difficulty is the bony insertions of the circumflex fascia. When, in a case of cleft, the horizontal plates of the palate bones are far separated, and when in the operation for the cure of the cleft the stitches are, as they must be, passed through this fascia, no amount of traction will bring the parts of the flaps containing this unyielding structure together, and any division of the tendon between the muscle and the bony attachment of the tendon is not likely to be of much assistance. The only proper course, then, is to effect the dislodgment of the bony insertion; and, fortunately, this may be easily done.

The following operation, as the second stage of the treatment of a complete cleft, or for the treatment of a cleft involving only a small part of the hard palate, has been in my hands invariably successful. The flaps are to be pared from below upwards, especial care being taken that the fork of the cleft be cleanly pared. An incision is then to be made on each alveolar process corresponding to the position of the first and second molars, and the raspatory introduced as far as the fork. From this point the flap is to be raised along the edge of the cleft as far as the posterior internal angle of the horizontal plate of the palate bone. Some difficulty is always experienced in raising the periosteum from the palatal plate of the maxilla, but from the palate bone it is easily stripped; and I need scarcely say that it is of the utmost consequence to keep close to the bone, and not to *button-hole* the flaps—the raspatories, therefore, must not be sharp. Having reached the point indicated, the blunt convex edge of the raspatory is to be used to scrape the tendinous attachment of the muscle off from the semilune of the palate bone; it rises easily along with the periosteum, and in doing this the thin mucous membrane on the superior surface of the velum is to be torn through. This is to be continued until the apex of the hamular process is reached, and in this proceeding it will be found that the muco-periosteum round the posterior palatine vessels will be loosened and raised without injury to those important structures. The point of the raspatory must not be introduced into the canal containing these vessels. The stitches may then be introduced, and, if necessary, the external incision may be continued backwards to the tubercle of the maxilla, and the anterior column be snipped across. In this way the flaps may be made to meet accurately, and a successful result may almost certainly be obtained.

The following brief notes of all my operations may serve to illustrate the foregoing remarks:

A lad, aged 10, on whom I operated without chloroform, and divided the muscles completely after Fergusson's plan, was not benefited in the least. The cleft involved the hard palate to a very slight extent; the wound opened on the third day, beginning at the usual point, and the flaps subsequently atrophied completely.

A girl, aged 14, in whom the cleft involved about one third of the hard palate, was operated on under the influence of chloroform, the muscles divided after Fergusson's plan, and the muco-periosteum lifted to close the cleft in the hard palate. On the third day she ate a lot of half-ripe gooseberries, and succeeded in tearing open the posterior third of the wound. The rest united perfectly; but now, nearly three years after the operation, the soft palate has completely disappeared, and there is not the slightest improvement in the voice.

I operated on a lad, aged 21, with a complete cleft, and closed successfully, at the first sitting, the whole of the cleft in the hard palate, without using chloroform. A month afterwards I operated on the cleft of the soft palate, dividing the muscles of the right side by Sir W. Fergusson's plan, and those of the left by Mr. Pollock's. This operation was completely successful, save the usual pin-hole; but the soft palate has completely disappeared now, two years after the operation. There has not been the slightest improvement in his speech, but his comfort in eating is much increased.

I operated on a cleft of the soft palate in a young lady, dividing the muscles by Mr. Pollock's plan. The operation was successful, but the flaps had quite disappeared within six months after the operation, and the speech was as indistinct as ever.

In the case of a lad, aged 19, on whom I operated without the division of any muscles, and in whom the cleft involved nearly a half of the hard palate, the wound united all but an aperture large enough to admit a cherry-stone, at the usual spot. This hole shows no disposition to close; but now, nearly a year since the operation, there is no atrophy of the flaps, but the voice has not improved in the least.

In the case of a child, aged 10 weeks, with a complete cleft, a patient of Mr. Kemp, of Wakefield, I closed the entire cleft at one sitting, without the division of any muscles and without the use of chloroform. On the sixth day the wound was completely united; but on the tenth a speck of ulceration appeared at the junction of the hard and soft palates, and spread slowly along the line of union, completely backwards and forwards for a third of the hard palate. The failure in this case was due, I think, partly to the performance of the operation without chloroform, but principally to my having done too much at one operation. In a child, aged 13 weeks, with a complete cleft, I succeeded in the first operation in closing the cleft in the hard palate, without the use of chloroform. The second operation, on the soft palate, failed, because it was performed without chloroform.

In the remaining cases I have always kept the patient under chloroform, and have employed the measures described in the body of this note, and I have been invariably and completely successful.

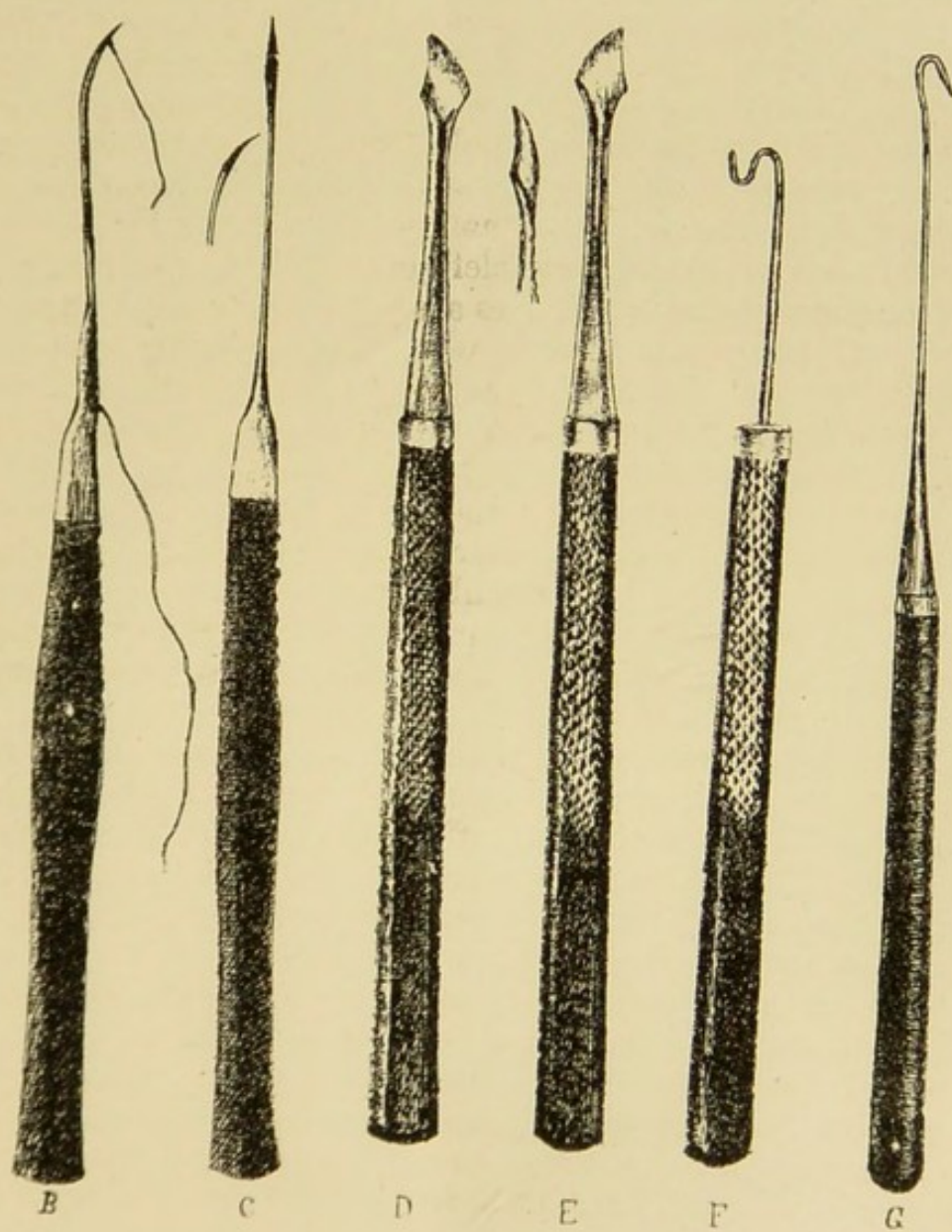
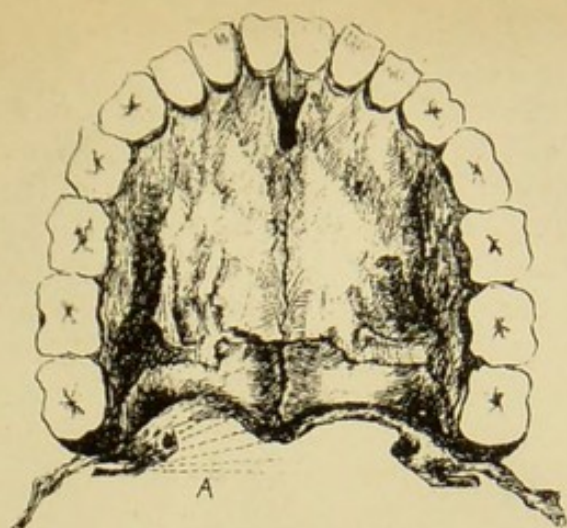
In a lad, aged 15, I closed a complete cleft by two operations at six weeks' interval. Five months after the operation the flaps had not atrophied in the least, but the voice had not improved in the slightest degree. He expressed himself very grateful for the increased comfort he had derived from the operation in eating and drinking. I closed a complete cleft in a patient of Mr. Greenwood's, of Ossett, a lad, aged 7, by two operations at a month's interval. The cleft was very wide, and the walls vertical; but now, eight months since the operation, very little trace can be found of the operation, and there is no atrophy of the flaps. The voice, however, has not improved in the least.

In the case of a female child, aged 9 months, in whom the cleft involved a third of the hard palate, I completed the operation at one sitting, with a success so perfect that now, six months after the operation, there is no trace of the operation discernible. In this case my friend Dr. Atkinson was my only assistant, and to his admirable skill in the difficult task of combining the administration of the anæsthetic with the management of the spoon the perfect success of the case is in no small measure due. There have been several cases of intermaxillary cleft in the family of which this child is a member, so that its relatives are perfectly familiar with the peculiarity of the voice in those in whom this deformity exists. They inform me that the child is now beginning to talk, and that no abnormality can be detected in its voice; that it is quite different from the others of their family similarly affected.

Several distinguished surgeons have seen the last two cases, and have been pleased to signify their satisfaction with the results.

Four months ago I successfully operated on a cleft very similar to the last, in a male child, 23 months old. The parents and child have disappeared from the neighbourhood, so that I cannot say what the result has been on the voice.

These are all the cases on which I have operated, and it may be said with some justice that I speak from limited experience; but the success which has attended my efforts in the last four cases has been so marked that I believe I am justified in recommending the process I have adopted. I am, moreover, quite convinced that, if the operation is to have any beneficial influence on the voice, it must be performed during infancy, either before or very soon after the child begins to speak. I had a case lately of an infant in whom I had intended closing the cleft of the anterior palate a few days after birth, but the little unfortunate died of starvation during my unavoidable absence. I think that we might save many of these children if we could help them to suck by giving them a roof to their mouths.



M^{rs} LAWSON TAIT ON STAPHYLORAPHY.

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