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THREE NEW PLASTIC OPERATIONS ON THE NOSE AND THROAT.

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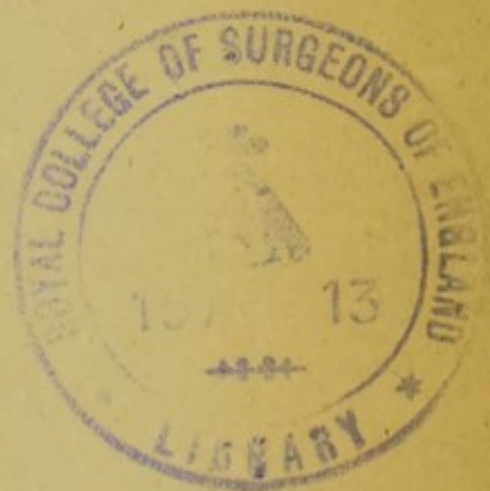
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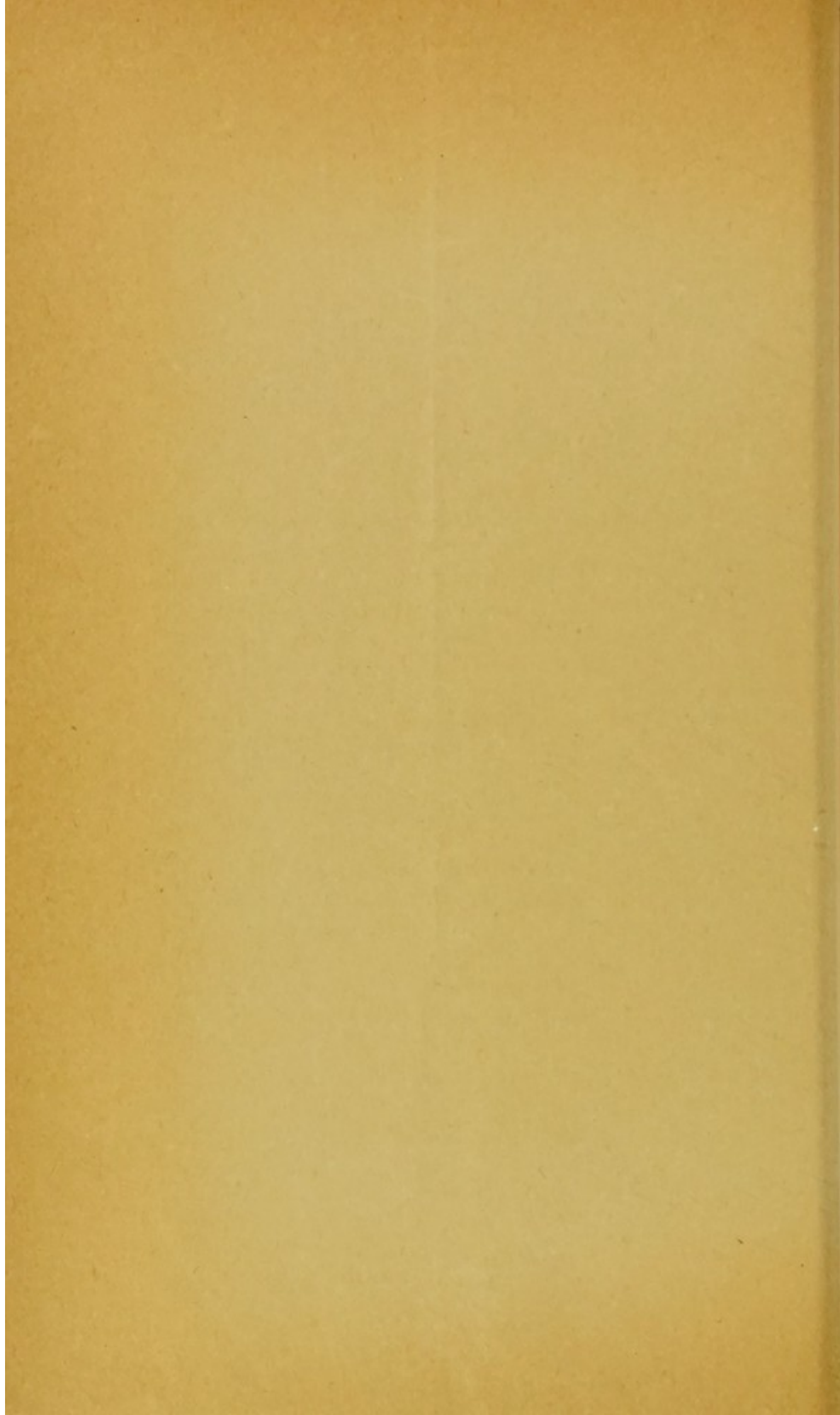
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THREE NEW PLASTIC OPERATIONS ON THE NOSE AND THROAT.*

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It is my privilege to present for consideration and judgment three new plastic operations on the nose and throat. The first is for the relief of the various obstructions of the anterior nares. The second is for the correction of septal deformities in children without sacrificing the septum. The third attempts to cure atresia of the soft palate to the nasopharyngeal wall by a surgical procedure. The work on the first and second of these covers a period of five years; on the third, of less than one year.

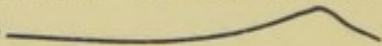
AN OPERATION FOR THE RELIEF OF THE VARIOUS OB- STRUCTIONS OF THE ANTERIOR NARES.

The problem of relieving obstruction in the anterior nares is constantly presenting itself to the rhinologist. Collapse of the *alæ nasi* has been and is the *bête noir* of this class of cases. For the sake of brevity I shall not allude to the literature on this subject as it is scanty and unsatisfactory, but shall go directly to its clinical consideration. The fol-

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lowing is what we frequently observe: (1) A narrow nose with weak, flaccid alæ. (2) Thickening of the septal base in its anterior part. (3) A great redundancy of the soft parts below and anterior to the cartilage. (4) The floor of the nostril just beyond the entrance is sometimes observed to rise from $\frac{1}{8}$ to $\frac{1}{6}$ of the total distance to the apex of the opening, thus forming an obstructive ridge at a right angle to the meatus. Thus from the inner and outer sides and from the floor the lumen of the nostril may be encroached upon. In the above deformities prenatal conditions combine with defective nasal breathing during the growing period to produce the picture. (5) The traumatic nose with broken down, piled up cartilage and distorted, irregular anterior floor.

The better to understand what follows, I shall give you a brief description of the anatomy bearing upon this operation. In the desiccated skull the nasal openings resemble an ace of hearts inverted. With the lower boundary of this opening we are concerned. You will observe that it presents a sickle-shaped edge, more or less sharp and more or less raised above the floor of the nasal passage behind. If the floor level behind be carried forward we find that this edge in many skulls is from $\frac{1}{2}$ to $\frac{2}{3}$ cm. above it. Now if we examine a nostril *intra vitam* we shall observe that this edge lies about 1 cm. behind the junction of the upper lip and nasal opening, and that the direction of this portion of the nostril floor inclines upward to meet at the apex of the ridge the upward inclined plane of the meatal floor behind (Fig. 1). This crescentic ridge then forms the highest portion of the floor, which might be represented thus 

Forward of the ridge, and on the floor and inner aspect of the nostril, are loose, areolar tissue and fat covered by skin and mucosa. The bulk of this subcutaneous tissue varies in different individuals. In some it encroaches materially upon the lumen of the opening. The lower inner boundary of the opening is formed by the anterior nasal spine and intermaxillary crest joined above by the quadrilateral cartilage. These are sometimes thickened and distorted and encroach upon the opening from the inner and lower margin. My operation aims to place the

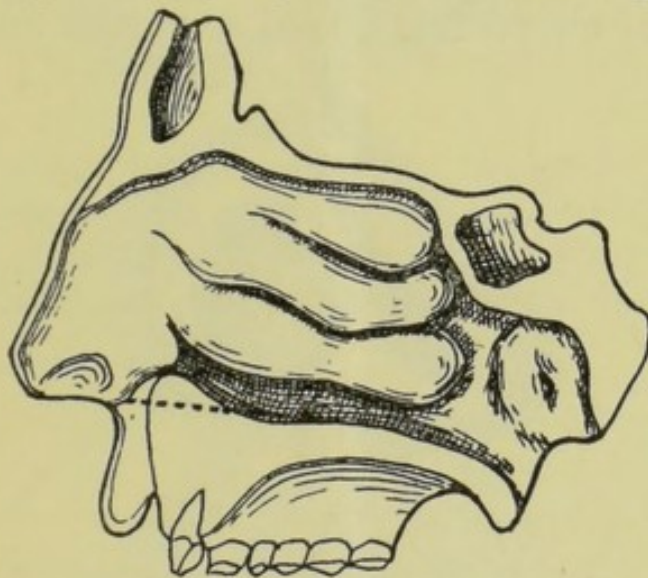


Fig. 1.

floor of the nasal opening on a level with or below that of the meatal floor behind, and to widen the opening at its lower and inner aspect by removing the bony ridge, part of the anterior nasal spine and intermaxillary crest, and all redundant soft tissue from the floor and septal side.

An incision begun well up on the septal side and a little to the skin side of the rounding edge of the nostril is carried down to and across the floor and up into the ala. (Fig. 2.) It is better to include

all the subcutaneous tissue, as it strengthens the flap during the subsequent manipulation. The dissection is continued backward, using scissors and scalpel, until the ridge of bone on the floor is reached. Here the periosteum is incised and, as the dissection continues backward over the ridge, is included in the raised flap. With small chisels and Kerrison's bone forceps the bony ridge is removed over the full width of the opening and downward until the whole floor of the nasal cavity lies on the same plane. Then with a sharp, straight chisel the base of the septum (nasal spine and intermaxil-

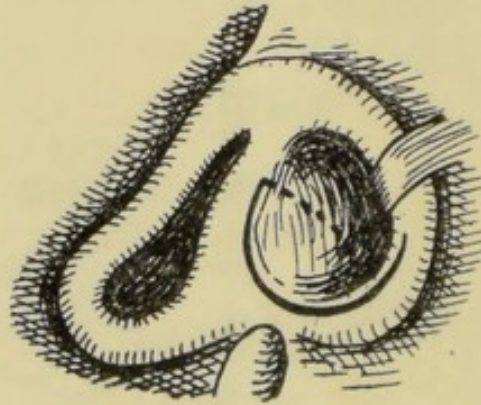


Fig. 2.

lary crest) is shaved down, beginning well forward and extending well back of the crescentic ridge, but the whole thickness of the septum must not be removed. Then the flap, which is quite thick in front, is thinned down by removing all the fat and areolar tissue from its under surface until nothing but the true skin and mucous membrane remain.

Now if the work has gone successfully we find that the new nasal floor lies about $\frac{1}{2}$ to $\frac{2}{3}$ cm. below the old one, and that the skin and mucous membrane flap is too short to lie upon it. In my early cases I incised the flap from before

backward along the center of the floor and laid the severed portions on either side, but this brought the line of contraction in the worst possible place, so it occurred to me that by placing

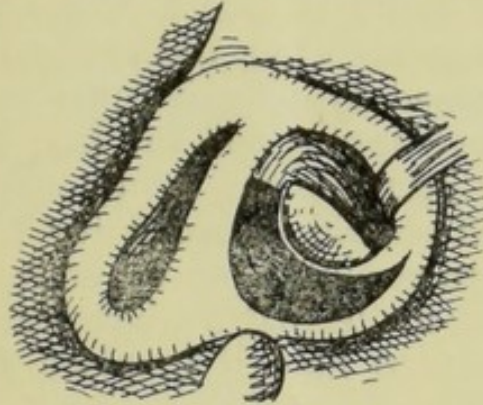


Fig. 3.

the bare area (necessitated by bringing the flap down to the newly made floor) on the septum a minimum amount of contraction might be secured. The flap is therefore incised (as seen in Fig. 3)

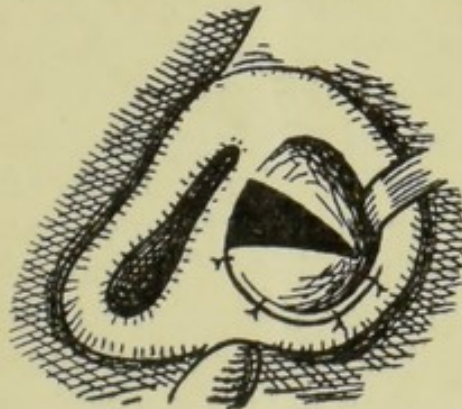


Fig. 4.

as high as possible on the septal side, the incision being directed backward and downward toward the floor, which it meets at the farthest back point of denudation.

The flap is lowered to the new floor and stitched in place with fine iodized catgut (Fig. 4). Either

vaseline gauze or a molded guttapercha splint, made to fit the case, holds the flap gently but firmly in position. The splint is made in the usual way by molding dental guttapercha. For these cases I cut the splint so that a flange projects forward and downward over the upper lip, to which it may be fastened by adhesive plaster. This prevents the splint slipping too far into the nose and tends to better keep the flap firmly against the new floor. A splint should be worn for ten days constantly, and then at night only for some time longer. It should be so made that its backward projection is sufficient only to hold it in place and keep the nostril well open.

This operation has been done by me on fourteen cases: For thickening of the anterior nasal floor due to fracture, in one case; for congenital high placement of the anterior nasal floor, in two cases; for encroachment on the nasal opening, from a combination of thickened septum, high nasal floor, and redundancy of the soft parts, in three cases, and for collapse of the *alæ nasi*, in the remainder. The degree of alar collapse in these cases varied from a mild interference with inspiration to a marked falling in. The operation does not open the nostril over the point of collapse. It enlarges the nostril downward and inward. The current of air thus has a free access and the *alæ* are not sucked in on each inspiration. In this way indirectly the collapsed area above stands more open during inspiration. All the cases were much benefited by the operation.

The operation may be done under cocaine, but it is difficult to anesthetize the bone. Ten of my cases were done under general narcosis. The oper-

ation is difficult, first on account of bleeding, and second on account of the careful dissection necessary to raise the periosteum from the ridge and behind the ridge, without buttonholing it. On the integrity of the flap depends the result of the operation, since cicatricial contraction is fatal to its success.

A PLASTIC OPERATION FOR THE RELIEF OF SEPTAL DEFORMITIES IN CHILDREN.

This procedure is also applicable in adult cases where the septal deformity is so near the front that

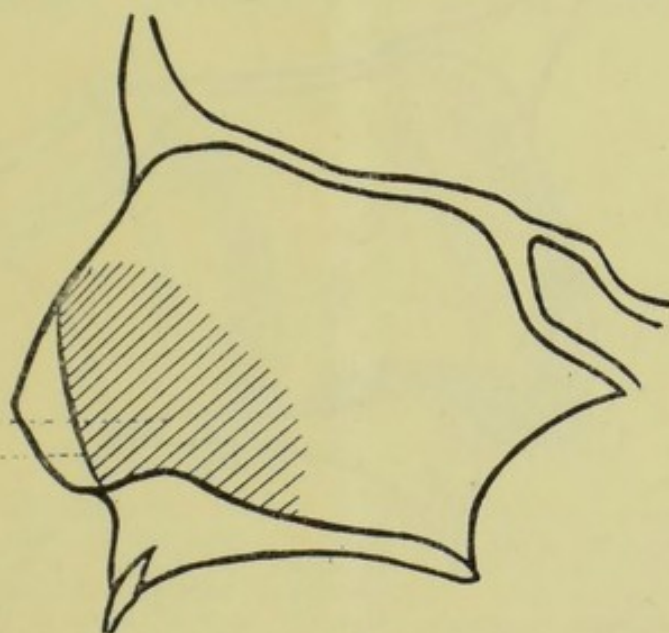


Fig. 5.—Lateral view. 1, Area of deformity. 2, Primary incision.

the ordinary submucous resection would endanger the contour of the nasal tip. It has been too much the custom to leave the septal deformities of children until about the fifteenth year before attempting their correction. Two reasons are uppermost in bringing about this delay. The first is fear of stunting the development of the nose. The second is the difficulties encountered in internasal work in

children, since the work must usually be done under general anesthesia and must, by the older methods, be followed by weeks of after-treatment on an unwilling subject. These reasons certainly do not weigh against the paramount necessity for proper nasal breathing during the developmental period of childhood. I need but hint at the long train of deformities and diseases attendant upon obstructed nasal breathing during this period, to convince you

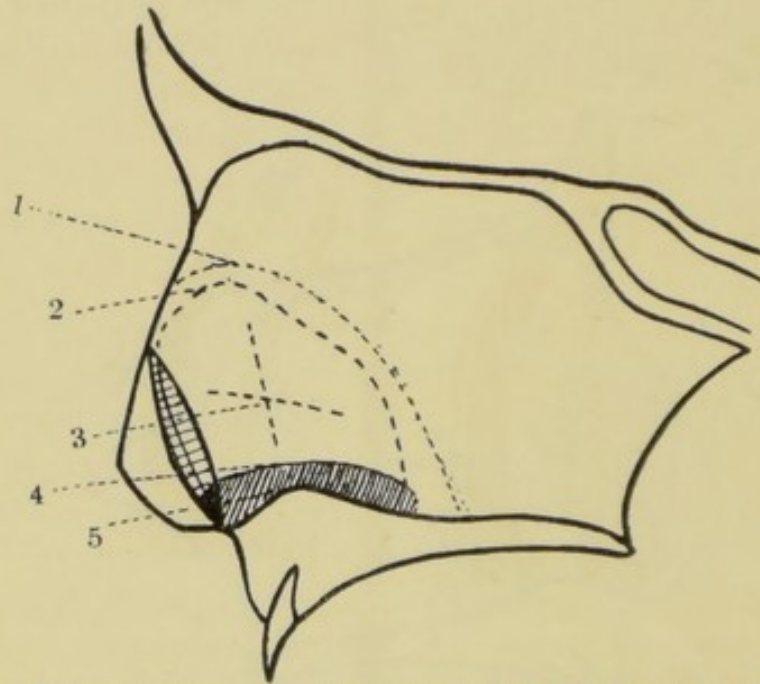


Fig. 6.—Lateral view. 1, Occasional line of incision above and behind the mucous membrane flap. 2, Line of incision through the cartilage under the mucous membrane flap. 3, Lines indicating possible angulations of deformity. 4, Anteroposterior incision through the cartilage to the distal mucous membrane. 5, Area of cartilage removed.

that in every case of nasal obstruction in childhood corrective treatment should be undertaken just so soon as the condition is discovered.

The type of septal deformity most commonly met with in children is a marked and angulated deviation of the cartilaginous septum. This may occupy any portion of the cartilage. I would remind

you that the cartilage occupies a proportionately greater area of the septum in children than it does in adults. Here the angulation is sharp, often well forward, and may be both in the horizontal and perpendicular directions.

I would set the following requirements in any septal operation on children: (1) The removal of only sufficient cartilage or bone to allow the remainder to fit into the nasal frame without overlapping or crowding. (2) The destruction of no mucous membrane. (3) The maintenance of a perfectly straight cartilage without the necessity of

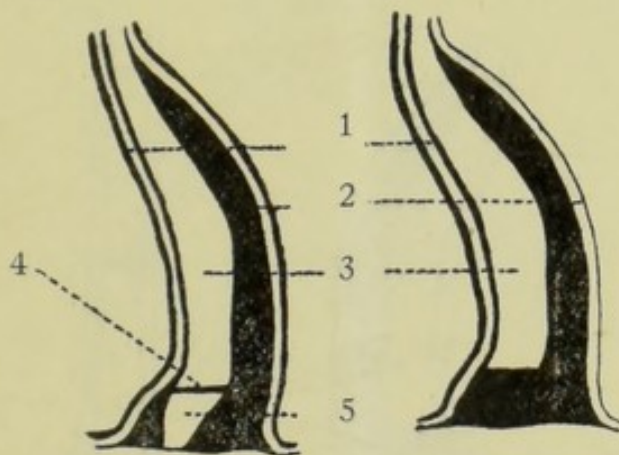


Fig. 7, Anteroposterior view. 1, Distal mucous membrane. 2, Proximal mucous membrane. 3, Deformed cartilage. 4, Anteroposterior incision through the cartilage to the distal mucous membrane. 5, Area of cartilage to be removed.

splinting for more than four or five days. This means that all points of leverage should be carefully cut at the time of operation. (4) The operation should be so done as to require practically no after-treatment more irksome to the child than an occasional inspection.

All the crushing operations on the nasal septum are even more ineffective in children than they were in adults before the advent of the submucous resection. They are quite on a par with the gunshot

prescription in medicine. The poor ultimate results and the long and irksome after-treatment urged me to try the following plastic procedure. The results when the operation was accomplished, as described below, have been satisfactory. I have observed no return of the deformity or interference with the normal development of the nose. In children under 12 years chloroform or ether anesthesia is used. Chloroform is preferred, as it engenders much less bleeding. In children over 12 and of phlegmatic temperament I have used, occasionally, local anesthesia. When general anesthesia is given

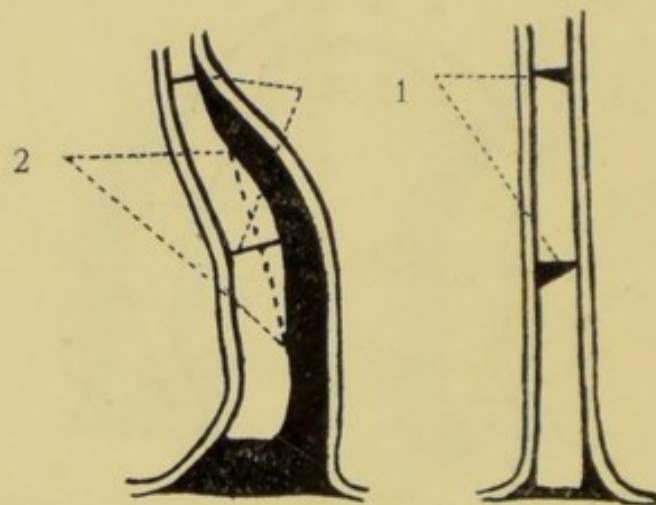


Fig. 8.—Anteroposterior view. 1, Incision in the cartilage at the lines of angulation. 2, Line of possible shaving.

bleeding adds tremendously to the difficulty of the operation. I have had in some cases a fairly dry field by packing the nose with adrenalin on cotton for 15 minutes before the anesthetic is given. In a few recent cases I have raised the flaps under cocaine anesthesia and completed the operation under ether.

The operation: An incision is made well forward of the deformity, beginning as high as possible on the septal side and extending down and

across the floor to the external nasal wall. (Fig. 5.) The mucous membrane and perichondrium are then elevated all over the face of the deformity and well behind and above it. (Fig. 6.) So far the procedure is exactly the same as that used in the ordinary submucous resection. Then the cartilage is incised to the mucous membrane of the other or distal side, from before backward, the whole length of the deformity and at an elevation of about one-quarter to one-third of an inch from the nasal floor (Figs. 6 and 7). This strip of cartilage is removed flush with the floor, taking with it the

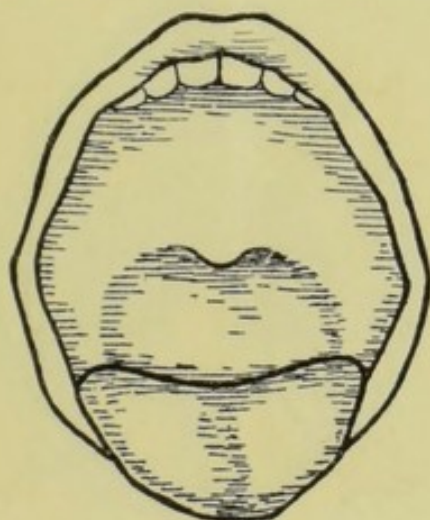


Fig. 9.

intermaxillary spine. Care must be exercised not to separate the mucous membrane from the remaining cartilage on the opposite or distal side. An angular knife is introduced under the mucous membrane flap to a point behind the deformity (proximal side) and an incision is made extending upward to the junction of the cartilage with the nasal bones, then forward along the upper border of the deformity to the tip of the nose. This incision goes to, but not through, the mucous membrane of the

opposite side. Occasionally this incision is made behind and above the mucous membrane flap, thus cutting through the mucous membrane and cartilage on the proximal side wall behind and above the farthest point of denudation. This latter incision limits, to some extent, the blood supply to the flap from behind and above, but leaves it still attached to the floor, where it receives sufficient nutriment.

Now, it will be observed, we have the area of deformity separated *en masse* from the rest of the

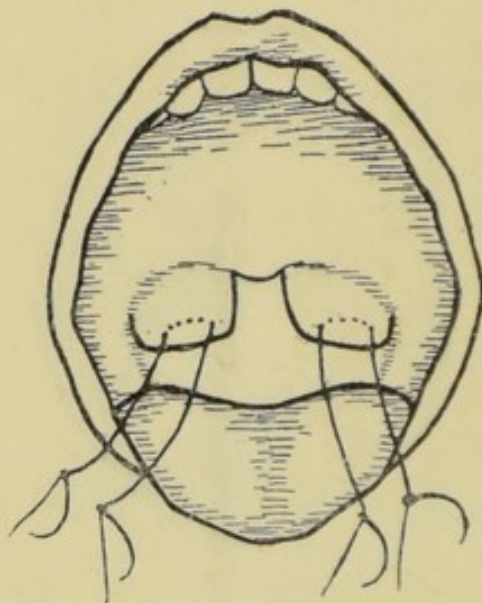


Fig. 10.

septum, being attached to it only by the mucous membrane of the opposite (distal) side and by the soft tissues at the skin margin in front of the septum. Through these two points the loosened area of cartilage receives its blood supply. This separated plate of cartilage may now be moved over to the median line, swinging upon its upper margin as a hinge. As it swings to the center its lower margin approximates the floor, filling in partially

or wholly the space from which the strip of cartilage has been removed.

Often, unfortunately, the surface of the loosened cartilage occupies two or more planes, so that when brought to the center, as described above, it still, by its various angulations, does not form a perfect plane with the septum behind. (Fig. 8.) To remedy this, incisions are made at the junctions of these planes through the cartilage to the mucous membrane of the opposite side. This divides the cartilage into two or more pieces, which can then be

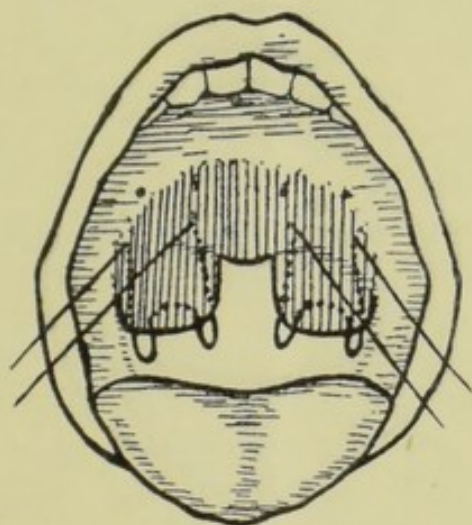


Fig. 11.—The points of emergence, a, b, c, d, should be higher than indicated in the diagram; as e, f, g, h.

readily adjusted so as to occupy but one plane in the central line. (Fig. 8.) The cartilage may be thinned by shaving it. The original incision in the mucous membrane is stitched. A molded gutta-percha splint is introduced on the side of the deformity and worn for four or five days. No further splinting is necessary. When the operation is properly done the cartilage should occupy the center with no tendency to revert to the old position. If any point of leverage is left uncut no

amount of later splinting will prevent the deformity from partially or totally returning.

When the deformity involves the bony septum it is generally in the shape of a ridge or angular deviation extending upward and backward. To remedy this a small hole is made in the cartilage where it joins the bone. A mucous membrane elevator is introduced through the opening to the distal side and separates the mucosa from the concavity of the ridge. On the proximal side the mucous membrane is also elevated from the convexity of the

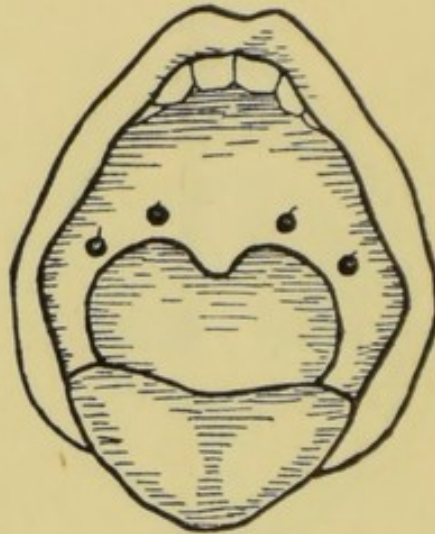


Fig. 12.

ridge. The strip of bone thus exposed is removed. Then with flat bone forceps the upper and lower segments are broken over to the center line. Their convergence fills in the space formerly occupied by the bone removed, thus neither crowding nor overlapping occurs, and the septum tends to remain in the center without splinting.

I devised this operation five years ago and have done it over 100 times. The earlier cases were not all successes. In one case the loosened piece of cartilage sloughed out, but in my later cases I have

had no failures. This I attribute to the greater care exercised in reducing all points of leverage by complete incision (Fig. 6) and by better conserving the blood supply to the partially severed cartilage.

A PLASTIC OPERATION FOR THE RELIEF OF ATRESIA OF
THE SOFT PALATE TO THE POSTERIOR
NASOPHARYNGEAL WALL.

Many procedures have been brought forward for the relief of this very obstinate deformity. The only ones that deserve mention are those of Nichols and Roe. Nichols' operation was some advance upon the older methods of divulsion and of incision with retention splints. Its principle is to cicatrize the external angles of the nasopharynx by retained silver wires or silk prior to cutting the nasopharynx open. Roe announced last year a new operation setting forth the correct principle which is to cover the posterior surface of the soft palate with a mucous membrane lining. He accomplishes this by taking a flap from either cheek and sewing them to the posterior surface of the soft palate. I did this operation on a case of syphilitic atresia with adhesions extending one-half an inch up the posterior wall. It was further complicated by having had two former operations fail, one a simple incision and the other Nichols' wiring at the angles. The result was good. Dr. Roe, in his paper, gave the scantiest details of technique. I attempted the operation under ether anesthesia but got no further than an inspection of the field. It seems to me utterly impossible of performance except under local anesthesia. Even under local anesthesia it is so difficult a procedure that I was prompted to look about for some more simple

method of procuring the necessary flaps. This led me to devise the following operation:

In all these cases of atresia that have come under my notice the mucosa covering the anterior surface of the palate is continuous with that covering the posterior pharyngeal wall. These two mucous membranes are so fused that all lines of demarcation have disappeared. On either side the pharyngeal pillars are dimly outlined, giving the lateral boundaries of the original nasopharynx. In the

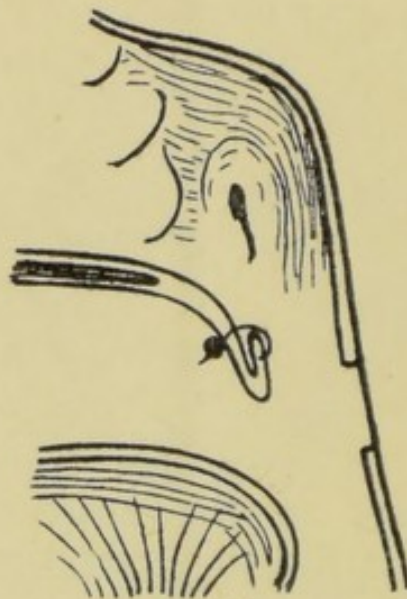


Fig. 13.

center we generally find a small opening, sufficient to admit a probe, leading up into the nasopharynx. With a bent probe in this opening it is possible to outline the extent upward of the atresia. (Fig. 9.) The principle of my operation is to line the posterior surface of the palate with two flaps, one for each side, taken from the posterior wall of the pharynx below the original curve of the soft palate. These flaps should be taken off as far down the pharyngeal wall as the atresia extends up the naso-

pharyngeal wall, so as to completely cover the denuded area.

The technique is quite simple. A curved needle armed with a fine silkworm gut is introduced into the mucous membrane of the posterior pharyngeal wall just to the outer side and about 1 to 2 cm. below the central opening mentioned above, and carried laterally to emerge at the edge of the posterior pillar. A similar stitch is taken on the other side. The points of entrance and emergence are about $1\frac{1}{2}$ cm. apart. (Fig. 10.) With a sharp scalpel the flaps are now outlined, beginning at the outer side of the points of emergence of the stitches, curving downward and inward, then upward to end at the entrance of the small probe opening into the nasopharynx. Then with an angular knife or a curved scissors introduced through the opening into the nasopharynx, the atresia is separated out to the lateral pharyngeal walls and downward to the outlined flap incisions. The stitches are held as traction sutures, keeping the tissues taut while the flaps are being separated from the pharyngeal wall.

Now we will observe that the nasopharynx lies wide open and from the lower margin of the soft palate hang two flaps transfixed near their lower margins by two sutures. All that remains to do is to turn these flaps backward and upward against the raw posterior surface of the palate and stitch them in position. Four ends of sutures project from the mouth. Each end is threaded on a sharply curved needle. The needle is held in a special holder which grasps the needle parallel with the long axis of the handle. The needle is passed well up behind the palate and its point drawn forward through the palate above the raw area on the posterior surface. Similarly each of the four needles

are brought through on a line with their relative places in the flap. (Fig. 11.) By drawing them taut the flaps ascend and take their positions against the posterior surface. Fine perforated shot are threaded on each suture and clamped in position near the anterior surface of the palate, care being taken to allow for considerable postoperative edema. (Figs. 12 and 13.) The contraction which takes place on the posterior pharyngeal wall, from which the flaps are taken, is negligible, since the surface is soon covered by a mucous membrane graft from the edges. The stitches are removed in four or five days. Two weeks after the operation the finger is passed into the nasopharynx. This is repeated every four or five days for a month. Then (if deemed advisable) the patient is given a dilator to use at home, to be passed by him twice a week for three or four months. This dilator is a cone set at a right angle upon a handle and made in sizes to suit the individual case. Three patients have been operated on by this method. They are all cured. The nasopharyngeal opening shows no tendency to contract.

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