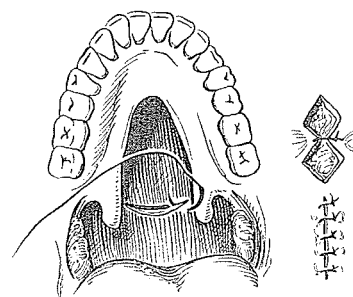


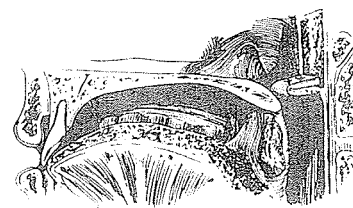
39. *Forward Projection of the Pharyngeal Wall by Flaps*

IN 1876 Rutenberg proposed that the pharyngeal wall be brought forward to enable it to be reached by the velum. A transverse incision in the posterior pharyngeal wall, when closed with sutures longitudinally, produced a projecting ridge and narrowed the pharynx.



PASSAVANT AGAIN

In 1878 Passavant condemned all his previous operations and devised another for the correction of velopharyngeal insufficiency. He developed a quadrilateral flap on the posterior wall of the pharynx medial to and above the level of the Eustachian tubes, its base connecting with the mucous membrane covering the superior constrictor muscle. This flap was elevated and folded on itself to create a shelf-like projection, the sides of which were united by suture to corresponding areas on the lateral walls of the pharynx. Here was an attempt by Passavant to out-Passavant Passavant's pad. Unfortunately, the shelf flattened out in time.



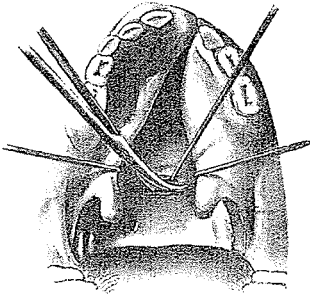
AUGMENTING PASSAVANT'S RIDGE

As Wardill of Newcastle upon Tyne once stated:

On examination of almost any unoperated cleft palate during the pronunciation of "ah" with the mouth wide open, a prominent ridge is seen running transversely across the posterior pharyngeal wall to appear into the upper reaches of the soft palate. . . . Passavant was the first to describe this. . . . With the help of my colleague, Mr. James Whillis, the superior

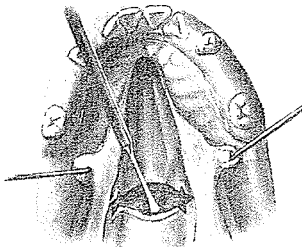
constrictor muscle has been shown to arise not only from the usually described situation, but also from the palatal aponeurosis.

In 1930 Whillis suggested that



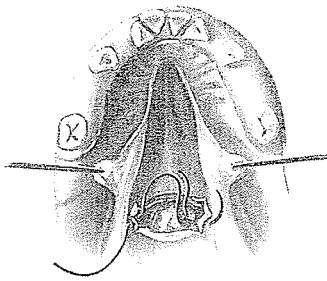
the most suitable name for this muscle is palatopharyngeal-sphincter, as its action appears to be assisting in shutting off the nasopharynx by producing the ridge of Passavant on the posterior pharyngeal wall.

WARDILL

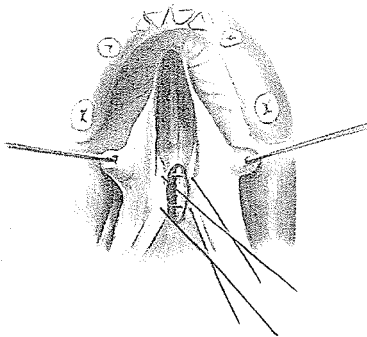


In 1927 Wardill advocated a pharyngoplasty similar to that of Rutenberg which was designed to increase the forward effectiveness of this superior constrictor muscle ridge. As he wrote:

The pharynx is stimulated and the position of the ridge of Passavant is noted. With a fine tenotome, the mucous membrane is incised transversely at the level of the ridge over the anterior arch of the atlas through the superior constrictor muscle.

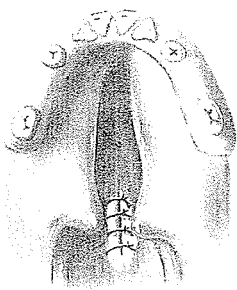


He freed this muscle from the buccopharyngeal fascia, extended the incision laterally as far as the salpingopharyngeus muscles and closed the horizontal incision in the vertical direction, thus achieving a ridge. At this time Wardill used merely relaxing incisions for his cleft closure.



In an overt gesture against British socialized medicine, Wardill migrated to Baghdad where Steffensen found him and made some pertinent inquiries. When asked, "Why not omit the pharyngoplasty in some cases?" Wardill responded with his typical, dogmatic logic:

In some cases this might be reasonable, but having gone through the time when about one percent of successful speech results was the rule, I am hesitant to discard a well-tried procedure which, to my knowledge, has never done any harm.



Gillies occasionally used the Rutenberg-Wardill pharyngoplasty. As he said:

This procedure is an application of the principle of bringing the mountain to Mahomet.

He cited an example of one case in which a Gillies-Fry push-back plus a Rutenberg-Wardill push-forward pharyngoplasty produced 100 percent normal speech:

The Wardill pharyngoplasty brought her pharynx forward in a definite ridge which is present today.

Today
was
1953

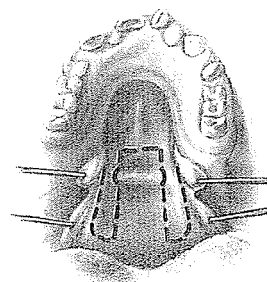
In 1947 Bentley, using the Wardill method in 87 cases, but 41 with Wardill's pharyngoplasty and 46 without, revealed a slight superiority with pharyngoplasty. His report showed that, without speech therapy, there were 36 perfect speech results in each category. There was imperfect speech in 10 *without* and in only five *with* pharyngoplasty.

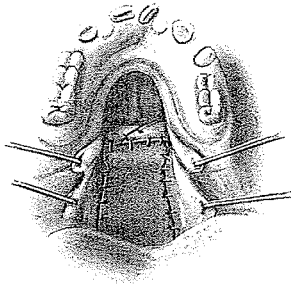
HYNES

Wilfred Hynes, trained by Gillies at Rooksdown House and head of FHMS 5 in Italy in World War II, developed an outstanding plastic-jaw unit nestling on a hill overlooking a little stream and woods on the outskirts of the great industrial steel city of Sheffield. With basic physiology and good common sense, which tempered him as strong as Sheffield steel, Hynes made contributions to plastic surgery. In fact, in 1950 he advocated a modified bilateral pharyngeal flap to produce forward projection of the pharyngeal wall. He raised vertical mucomuscular pedicles based superiorly, incorporating each salpingopharyngeus muscle. By transposing them 90 degrees, he slid them side by side to overlap each other under slight tension and sutured them into a horizontal incision through mucosa across the posterior pharynx. This maneuver created a prominent, (what was hoped to be) permanent and often contractile shelf above Passavant's ridge to act as the posterior wall of the palatopharyngeal sphincter. Hynes emphasized that closing the donor defects had reduced the transverse pharyngeal diameter, with an improvement in the pitch of the voice. He used his pharyngoplasty in conjunction with a V-Y palate closure and advised that it not be undertaken before the age of 10 years.



Wilfred Hynes





Each year Hynes ventured from his inaccessible unit on a pilgrimage to see what other plastic units were doing and to report on his own work. In 1952 he had just developed his pharyngoplasty and, on his annual jaunt, he called on Gillies at Harley Street and offered to demonstrate his operation at Dollis Hill Hospital, one of Sir Harold's old haunts. I had the good fortune to be allowed to accompany Gillies to observe Hynes in action.

After approving the Wardill-type pharyngoplasty as an adjunct in certain cases, Gillies added:

It is probable that the new, more positive Hynes pharyngoplasty will take its place.

In 1957, in *The Principles and Art of Plastic Surgery*, Gillies and I summarized:

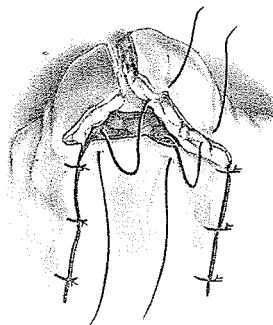
So, whether the palate is Dorranced, Wardilled, Brownd, or Gillies-Fried, with or without a tube pedicle, it still may be bolstered from be-Hyned.

A comparison

Williams and Woolhouse of Montreal in 1962 compared the results in 24 cases. In 12 a Hynes pharyngoplasty was performed and in 12 a lower-based pharyngeal flap was used. Oral manometer readings were considered to correlate very well with speech results. Williams and Woolhouse recommended the Hynes procedure in cases in which there was a minor degree of velopharyngeal incompetence.

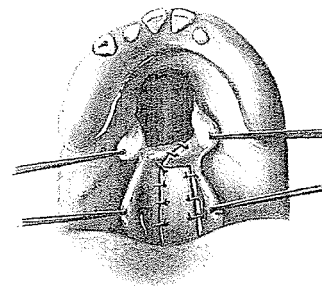
Refinements

In 1967 Hynes clarified the recent developments of his operation. First, the entire bulk of the lateral pharyngeal muscles, including

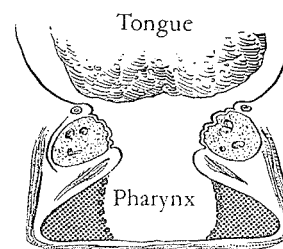


superior constrictor, palatopharyngeus and salpingopharyngeus, was incorporated in the flaps:

The two lateral flaps are then transposed upwards and inwards and are inset into a defect high across the posterior pharyngeal wall made by a transverse mucosal incision just below the level of the Eustachian region. [One of these flaps is set into the transverse incision and the second flap overlaps the first to form a bulky (tube pedicle-like) ridge.]



Hynes emphasized more at this time the inward advancement of the mucomuscular flaps and the narrowing of the pharynx with the closure of the donor areas. He insisted that actual closure of such large donor areas permanently obliterates the pharyngeal recesses extending laterally behind the posterior pillars of the fauces (shaded areas). This is an especially beneficial outcome in the “failed cleft palate” with the “enlarged static pharynx,” which, in spite of palate lengthening, continues to leak speech into the nose. As he wrote:



Thus, two synergistic slings have been created—a posterior element formed by the posterior pharyngeal ridge of the pharyngoplasty and an anterior element formed by the repaired velum.

Hynes did not advocate a primary pharyngoplasty for all clefts of the palate. He did prefer his “two-in-one” operation of V-Y pushback and Hynes pharyngoplasty in clefts of the soft palate only and in longer, wider clefts with less tissue to work with in constructing a competent velopharyngeal sphincter.

Although the Hynes pharyngoplasty was used all over the world, it became extremely popular in Britain for a couple of decades.

J. P. Reidy of London, an ardent apostle of Kilner, in 1964 gave his conclusions on pharyngoplasty and speech:

1. Where adequate palate repair is undertaken at 1 year, there is *no* indication for pharyngoplasty as well at that age.
2. Pharyngoplasty is indicated as a “supportive” operation only when the result of the palate repair can be assessed (5 years plus), and where the speech result proves disappointing.

3. The figure of 171 pharyngoplasties in 944 cases applies to the known speech results up to April 1963. It follows that with follow-up of the more recent primary cases, pharyngoplasty may well be necessary in some.

4. The Hynes pharyngoplasty has proved to be the most satisfactory.

I wrote to Hynes in 1971 and he responded:

About my pharyngoplasty, I well remember Sir Harold Gillies assisting me in a case some 20 years ago. The operation was done at the Dollis Hill Hospital, which as far as I remember, was a private concern—at least the patient was a private one. She was Miss McDonald whom I did not see before or after the operation and I suppose Sir Harold, pre-occupied at the time, forgot about asking me to see the patient again. I am, therefore, unaware of what he thought of the result or indeed of the operation. I can say, however, that the late Professor Kilner and his team accepted the operation with enthusiasm to the extent that they practiced this procedure extensively—and still do.

I recall 3 interesting incidents:

No. 1 I was approached by a cleft palate patient of 75 years of age, who demanded a pharyngoplasty so that he could at least utter one word correctly before he died. I need hardly say he died without the operation or realizing his ambition.

No. 2 I was approached by one middle-aged patient who wanted a cleft palate operation for cosmetic reasons. He was inclined to laugh rather easily and felt his mirth inhibited because of his fear of showing the very wide cleft in the roof of his mouth. I have never had any other request for a cleft palate operation for cosmetic reasons.

No. 3 I operated on a young parson, who was in fact a son of a Bishop, under rather pathetic circumstances. He had an insane desire to be a parson, I can say insane not because it is foolish to do this sort of thing, but because he wished to follow a profession where a good speaking and carrying voice is essential. He spoke reasonably well but could not project his voice far enough for the congregation in a normal-sized church to catch what he said. He was in fact traveling the country looking for a living with a church small enough to suit his diminished capacity.

Hynes concluded:

To the day I retired, I practiced my particular operation and was satisfied with the results. I never did the rival pharyngeal operation, so I am unable to compare the two procedures. However, I am quite convinced that my operation is the only one that meets the requirements of a patient whose pharynx shows reduced lateral movements as the lateral pharyngeal recesses are completely obliterated by my operation. Interestingly enough, my son,

D. M. Hynes of McMaster University, Hamilton, Ontario, Canada, worked out a radiological method of demonstrating the movements of the oropharynx and wrote it in *Clinical Radiology* in 1970.

In 1976 Joss of Norwich, England, wrote:

My colleague here, Frank Innes, uses a pharyngoplasty by Hynes, but there are very few people who use this method now.

Also in 1976, Innes wrote to explain his approval of the Hynes pharyngoplasty:

When the pharynx is too deep and too broad from side to side, the term "cavernous" is frequently appropriate: the best possible pushback of the soft palate will not achieve competent closure of the isthmus. An operation to bring the posterior wall of the pharynx forward and at the same time, to narrow the lateral dimension of the pharynx is required.

Wilfred Hynes of Sheffield showed us that this could be done. His pharyngoplasty (Hynes 1950) is another admirable application of basic plastic surgery principles. . . . The flaps should, however, be as thick as possible. . . . Hynes at first thought his pharyngoplasty ought to be introduced in the primary repair of clefts in young children, but I am sure that this is not necessary. The soft palate makes contact with the pharynx at a very high level in young children and I doubt if the Hynes pharyngoplasty eminence can be placed high enough to be effective in such young patients. . . . The Hynes operation works well only when the palate is effectively elongated.

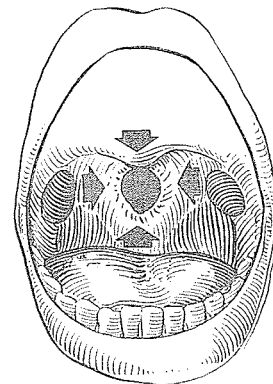
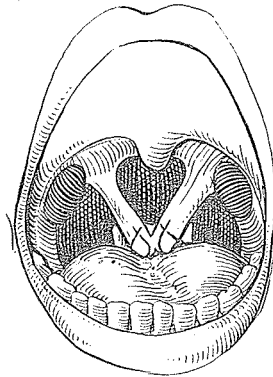
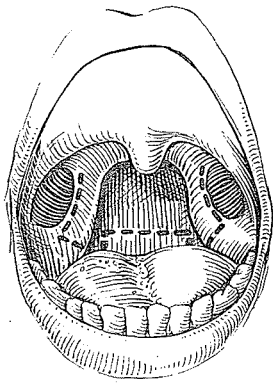
Like a number of other surgeons, I have always felt that the shelf created by this pharyngoplasty would tend to flatten appreciably in time. In fact, some would say it had as much chance of standing up for any length of time as a sand castle against the incoming tide. This assessment was more true of the original design and less true after Hynes thickened his flaps and almost tubed them to each other. The additional advantage of reduction of the lateral pharyngeal recesses must not be discounted.

CONSTRUCTING A SPHINCTERIC MEMBRANE

Another intriguing use of the posterior pillar flaps has been developed by Miguel Orticochea, of pure Basque descent, born in



Miguel Orticochea



3 to 5 weeks later

Montevideo, Uruguay, trained by Pitanguy in Rio and now running on "his own motor" in Bogotá. In 1970, in the *British Journal of Plastic Surgery*, Orticochea reported that for 11 years he had been closing the palate by simple approximation with sutures at 2 years of age. Six months later, at 2½, he cut the posterior pillars of the fauces, carrying the total palatopharyngeus muscles as two long rectangular flaps with superior bases. An inferiorly based pharyngeal flap, 1 × 2 cm., was elevated at the level of the tonsil, and the two pillar flaps were stitched side by side to the pharyngeal flap with U sutures. He compared this palatopharyngeus muscle transplant to the various muscle transplants effective in the hand and foot. Evolution of this sphincter over the next few months closed off the lateral spaces, resulting in a dilating-contracting circular hole, like the "diaphragm of a camera." Orticochea claimed that this sphincter in the membrane develops better, the younger the patient is at the time of the operation. He also stated:

Nevertheless, all the patients who presented with open rhinolalia before surgery, improved to a greater or lesser degree with the construction of the sphincter.

The vagueness of his report prompted me to quiz Orticochea during his "sphincteric" lecture to my residents in Miami in 1971. As he speaks little English, his presentation was interpreted by a capable Spanish-speaking E.N.T. resident. This situation, along with Orticochea's tendency to use such words as *all*, *always* and *never*, introduced a number of uncontrollable variables. Our discussion went as follows:

My first question:

"Miguel, do you always use this operation on all of your palates?"

"Yes. Ninety percent of Latin Americans with cleft palate have velopharyngeal incompetence. During 17 years of my practice in cleft lip and palate work, I have seen only two cases of direct suturing of the palate which functioned with competence, one in Buenos Aires and one in Bogotá. The Spanish language has only three nasal phonetics and the Latin American palates *all* are short with wide nasopharyngeal apertures. For this reason I use this sphincteric procedure in *all* cases. In certain cases when the flaps will

not reach, then the operation is done in two stages. If I lived in the United States, then I would use this operation only on incompetent cases.”

“Do you ever have failure of closure in the lateral holes?”

“Never! They are always closed in a few weeks.”

“Does fluid collect in the shelf behind your sphincter?”

“No, because the motion of the sphincter prevents the collection of fluid.”

“Does this affect tonsillectomy?”

“The tonsils can be removed at any time.”

“Here is an important case,” he emphasized, as a slide was projected of a palate with velopharyngeal incompetence in which the patient was saying “ah.” The posterior pillars of the fauces could be seen trying valiantly to make parallel approximation to each other but with a centimeter of failure.

My final question:

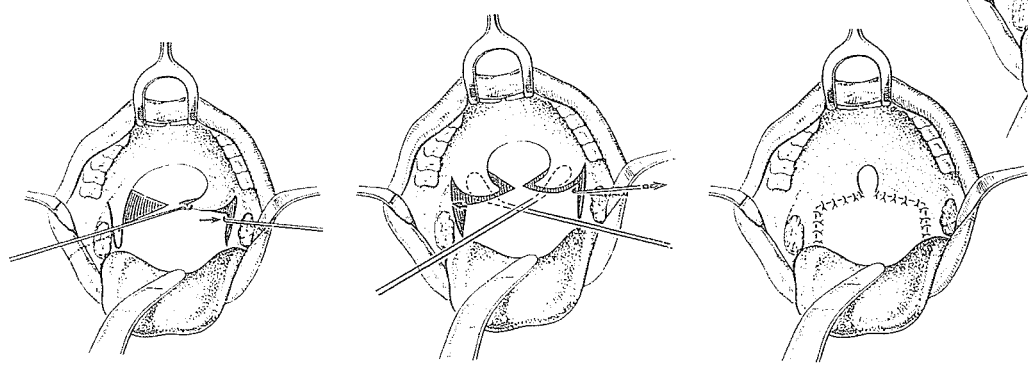
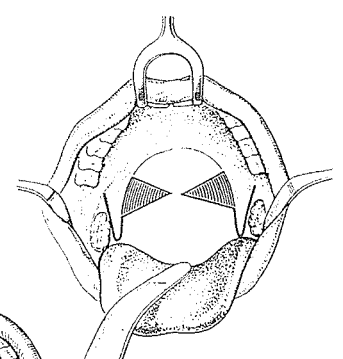
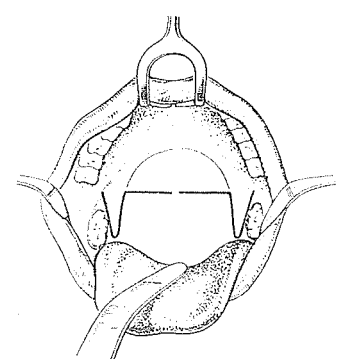
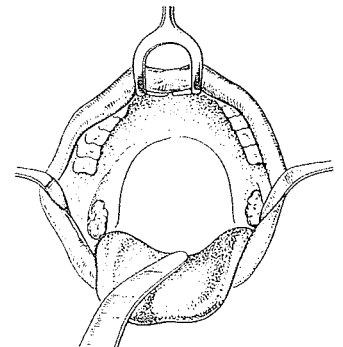
“What is your percentage of good speech results?”

“That is difficult to answer. I have no statistics.”

It should be noted that Ortichochea is an active and exciting innovator. Although I have found several of his ideas lacking in principle, there are some that have been important and have started a new trend (musculocutaneous flap). His variation in the use of bilateral pillar flaps sparked other modifications.

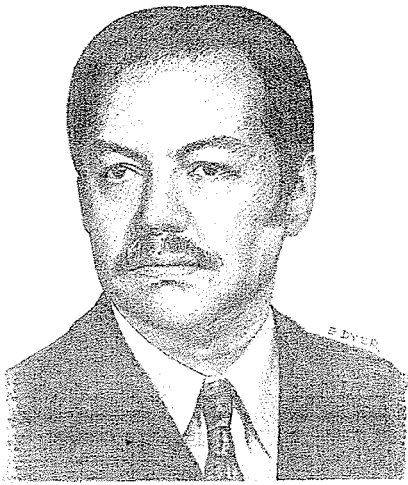
Amiable Heinz Reichert of Stuttgart, in the *Journal of Maxillofacial Surgery*, 1974, described a lateral velopharyngoplasty which he feels is an improvement over the Ortichochea procedure, both in principle and in technique. He explains concisely:

Using a Z-plasty, the lateral base of the pharyngopalatine arch is swung over upwardly and inwardly in exchange for a mucosal flap from the posterior pharyngeal wall. The palatopharyngeal muscle is thus transformed into an oval muscle sphincter, which actively closes the nasopharynx. . . . The application of the principles of Z-plasty ensures that no raw surfaces remain postoperatively, and that healing occurs fast and without complication.

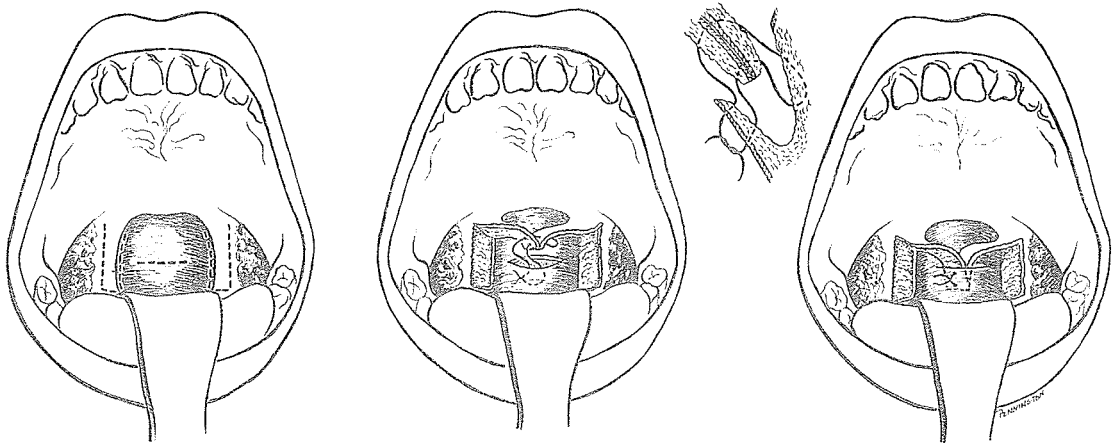


Reichert reported having used this procedure with success in three patients, noting that indication for the operation was limited to secondary scarred palates with poorly developed muscles.

Angel Heller of the Dentistry National University of Cordoba, Argentina, trained by Schuchardt, presented a modification of the pharyngoplasty of Orticochea in the 1975 *Journal of Maxillofacial Surgery*. He had found that in the Orticochea pharyngoplasty the sphincter closure showed a tendency to form a circular opening, the lumen of which was not always narrowed in sound function. Heller's variation developed bilateral palatopharyngeal flaps, based superiorly, which are cut from the posterior pillars. A transverse incision in the posterior pharyngeal wall made it possible to dissect a pocket. The two dangling palatopharyngeal flaps, with their mucosal surfaces back to back, were tucked into the pocket with a mattress suture. Thus, velar closure was achieved in an anteroposterior direction by a transverse closure so that a sphincter action could be more effective.



Angel Heller



Since 1968 Heller has performed 22 of these pharyngoplasties with his "crossed" palatopharyngeal flaps. He noted:

1. The double flap takes well in the surgical pocket where it is placed.
2. It is an easily performed technique with rapid, uncomplicated healing.
3. An active muscular closure is achieved during speech, with positive intrabuccal pressure.
4. The sphincteric closure is effective during deglutition, even when the flaps do not contain enough muscular fibres.
5. The nasopharyngeal closure may be perfect with a positive intranasal pressure and permits a free flow of air during muscular relaxation, which as

a result of the type of flap and its "scissors" mechanism, facilitates nasal secretion flow.

6. Even when dynamic muscular activity is not achieved in the secondary palatoplasties, the intercrossing of flaps proves to be an effective sphincteric closure.

In 1977, in *Plastic and Reconstructive Surgery*, Ian Jackson and John Silvertown of Canniesburn Hospital, Glasgow, presented their modification of Orticochea's operation as a secondary procedure. Two lateral flaps of postfaucial pillars, including the underlying palatopharyngeus muscles, were cut free, sutured to each other end on end and then tucked under a wide, superiorly based pharyngeal flap to create

a very bulky transverse roll on the posterior pharyngeal wall.

Of 100 cases, 74 have had at least one year follow-up, and speech results were reported to be 90 percent improved: 47 percent with no nasal escape; 23 percent with hyponasal speech at 3 months but none at 1 year; 4 percent with persistent hyponasal speech. In the six cases which had failed with the conventional pharyngeal flap, all showed improvement. Advantages of this sphincter pharyngoplasty were: (1) easy procedure, (2) velum not disturbed, (3) shrinkage less with contracture merely reducing the heart-shaped V.P. aperture, (4) less tethering during maxillary advancement, and (5) secondary adjustments possible.

