

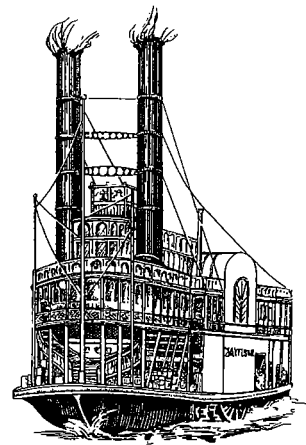
9. *Perfecting the Triangular Flap*

TWO great St. Louis surgeons directed their thoughts toward perfecting Mirault's principle and carrying it to its ultimate. They were Vilray Papin Blair, an anatomist and innovator, and James Barrett Brown, an exceptional craftsman. Both were well-trained general surgeons, and together they constructed a midwestern plastic surgery center at Washington University. From their headquarters by the muddy Mississippi they dominated the cleft lip surgical scene from 1930 to 1948, and during this time cleft surgery made great strides.

BLAIR

Vilray Blair was a descendant of one of the early French settlers who had come up the Mississippi River from New Orleans to St. Louis when this boomtown was the eastern gateway for adventurers, explorers, trappers, traders, missionaries, gamblers, soldiers and settlers. One of his forefathers was Vilray Papin, a trapper who often left his family for long intervals while out catching animals for skins. There was one time when he was gone for over a year. Upon his return he found that his wife, thinking him dead, had remarried and started a new family. Blair, a devout Catholic, delighted in the fact that he had descended from the legitimate side. He attended Christian Brothers College and had to ride horseback out and in from Grand Avenue, which, as he put it,

was one of the main reasons I was sent out there to school . . . and to shoot a few birds on the way home.



*already showing
promise as a
plastic surgeon*

From extracts of reports by J. P. Webster, Barney Brooks, R. H. Ivy and Gordon Letterman, the preparatory exploits that led to the making of this plastic surgeon can be unfolded. After one year in St. Louis Medical College, Blair took a year off to help string high-tension telephone wires across the Rocky Mountains. He returned to school and proved his ingenuity by graduating with his original class, having managed to receive credit for stringing wires. After six years of postgraduate training, he "broke flat," as he termed it, and took to the sea, ending up in Edinburgh where he tried to get into the Boer War as surgeon on a British ship. Barney Brooks, who had been at Washington University with Blair and Brown years before, was my surgical chief at Vanderbilt University in 1947 when he wrote of Blair's Edinburgh experience.

His application was refused because he did not have with him his medical credentials. He was out of money and pawned his watch chain, a family heirloom, for a pound. . . . Then he received a telegram offering him the position of surgeon to a ship sailing to Para. He wired acceptance and went to the Public Library to find in what part of the world Para might be.

Blair sailed a thousand miles up the Amazon and its Negro River branch and then signed on for a voyage to the white man's graveyard, the Gold and Ivory Coast of West Africa, where he joined a troop transport ship during the Ashanti War. His description of events was vivid.

I had not been at sea a month before my curiosity was permanently piqued by the partly fabled, partly true tales of the wealth, the dismal forests, the great rivers, the savagery, the mahogany, the gold and the curios of the surf-bound, fever-stricken west coast of Africa, which has furnished gold, ivory, and slaves to the civilized world from time immemorial. . . . I had not only the curiosity of an ordinary traveler, but my opportunities of observation of fevers of the Javery, yellow-jack, and beri-beri in the Brazils and leprosy in the islands, had taught me there were advantages in studying endemic diseases in their native habitat.

Blair was 30 years old when he returned to St. Louis, finally content to embark on a surgical career.

In time, Blair got to be known as the "lemon" surgeon of

St. Louis because everyone sent him problems and complications. He was a modest, unassuming type of genius who would wake up in the night and scribble down possible answers to problems. Then in the morning he would call in a friend to help him decipher his scribblings and decide whether the idea was any good or not.

Appalled by the many absurd operations being used at this time on cleft lips, Blair wrote:

As a rule the simpler plans are easier to execute but they are less plastic. Every added complexity of technique is a distraction. Before adopting the more complex methods, therefore, the operator should make himself familiar with every detail of the operation and should understand the logic for doing it. As the operator acquires more skill he may feel justified in adopting a method that in earlier days he considered less feasible, but each modification will be like changing a golf stroke—not always free from immediate grief.



Wilray Blair

In 1930 Blair and Brown wrote:

We have had experience with three different operations consecutively. The Mirault type was taken up ten years ago and has been used ever since. The Rose operation was finally abandoned on account of the difficulty in controlling the tendency of the reconstructed lip to be inartistically long. The Owen operation, which is a decadent form of Mirault, was also abandoned because the results were still more objectionable. It is upon the "Mirault operation" that the following procedure was based, but the details as given in this paper were gradually worked out from our own experience. The logic of the Mirault plan is that a flap is taken from the upper part of the lip where there is excess tissue and implanted into the lower border where tissue is most needed.

It was their belief that the lip defect is triangular in shape and positioned apparently in the lower part of the lip. This is the premise on which all Mirault-type operations are based.

The Blair-Brown outline of operative technique can serve today:

The first step is to mark off on the lip the plan of the external skin incisions. This will outline the raw surfaces to be united by sutures. Upon the accuracy of these cuts will depend the possibilities of the ultimate result. Therefore, while they are first planned and measured off with the eye, they

*but the
premise
is false!*

are checked up with fine pointed dividers and pricked in with aqueous methylene blue solution on a fine "crow quill" pen or a hypodermic needle, before any cuts are made, so that the landmarks are not obscured by the undermining and the accompanying flow of blood. The first operative step is the mobilization by undermining of each distorted or displaced tissue. This should release the restraining tissues from their underlying bony attachments, and at this stage cartilage may have to be shifted in its relation to bone, its fellows or the overlying skin. The most important point in the operation on the lip is not to excise too much tissue from the lip or any at all from the lining of the nose. Bad suture scars are almost as great an evil.

The Blair-Mirault design

The specific markings were set by pricking point A on the mucocutaneous junction where the oblique base of the columella intersects vermilion. B was placed just above where the ridge that bounds the philtrum on the opposite side meets the mucocutaneous junction. C is halfway between A and B. Okay so far . . .

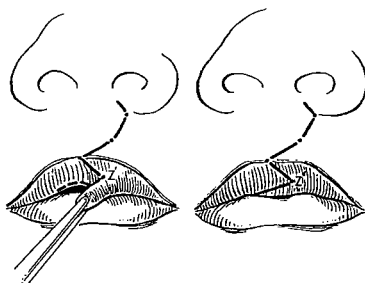
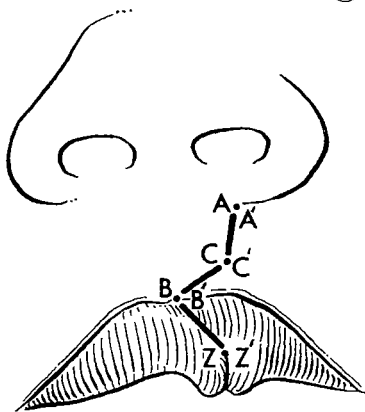
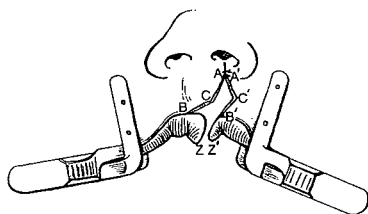
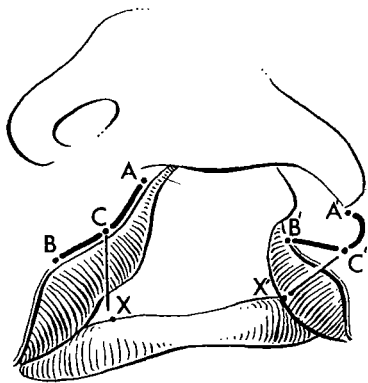
On the cleft side A' is pricked just below the point of the ala. The placement of point C' has a *mercurial elusiveness* which almost discouraged me in 1944 from trying to become a plastic surgeon at all. In Blair's own words:

The placing of point C' requires some consideration. It should be under and rather internal than external to A', and at a vertical distance from the vermilion border equal to CX. X is supposed to represent the future level of the vermilion border at this point.

B' is on the mucocutaneous line at a distance from C' equal to BC.

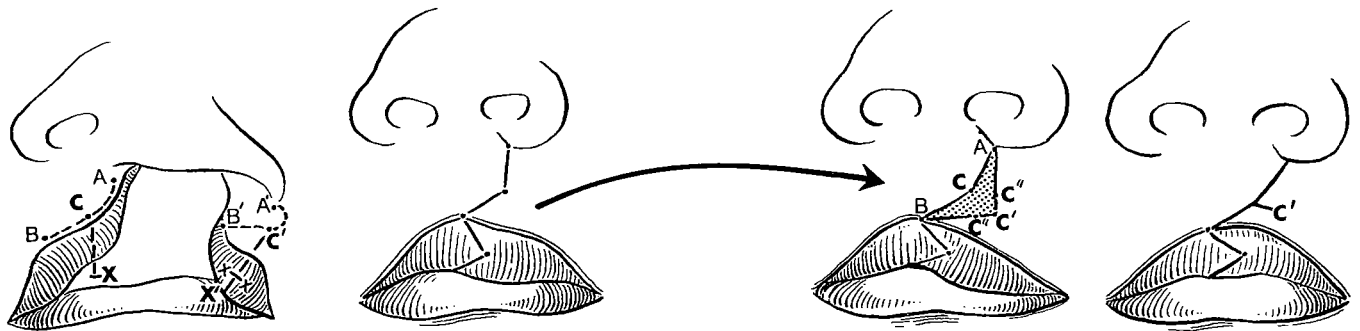
In the creation of a triangular flap C'B'X' from the cleft side, a relatively large amount of tissue was left attached above to the alar base as flap A'C'B'. Like Collis, Blair used as much as seemed indicated to aid in reconstructing the nasal floor. Unfortunately, much of this valuable tissue had no place to go and was simply amputated. Before the marks were incised, hemostatic clamps were applied; then A was sutured to A', B to B' and C to C'.

The vermilion Z flaps were interdigitated.



The hazards of placing C'

Misplacement of point C', with, for instance, C'X' being longer than CX, can be and often has been responsible for strange derangements, and the purse-string correction is not as easy as it seems.



As a pioneer of the flap approach to cleft lip, Blair was bombarded with arguments offered by the conservatives and he proceeded to collect scientific data to prove them wrong. He wrote:

The statement has been lately emphasized that using a displaced flap in the repair of a lip cleft would cause muscular distortions in the movements in the new lip; with this point in view, we have recently made a study, both directly or by means of movie films, of about thirty cases operated on by this plan, and, in none of them, after the immediate postoperative stiffness disappeared, were there any asymmetrical contortions evident.

Blair and Brown were among the first to define and try to correct the transverse axis of the cleft nostril and the flattening of the nasal tip on that side:

To correct these nostril distortions it is necessary first to mobilize all mal-related structures with the least amount of external scars; second, to draw them into the most natural form and position attainable; third, to fix them by suture until healing has occurred.

Blair also alluded to the importance of talent in the operator:

After the surgeon has gained the greatest possible surgical and mechanical skill with the most congenial method, he may still find that the results are not really pleasing unless his technique included also *artistry*, which here, as in portraiture, can camouflage a multitude of defects.

Amen!



Blair
by his
artist
Gertrude
Hance

Although Blair's sense of artistry made him painfully conscious of one of the shortcomings of his method, he accepted it with rationalization:

It seems impossible, by an acceptable means, to restore the philtrum, but the lack of one bordering ridge is not very noticeable if the restoration is otherwise pleasing.

Blair was crazy about horsehair for suturing skin, considering store sutures brittle and worthless. He kept an old white horse at the little Mullanphy Catholic Hospital, and whenever his supply got low he would go out and pull a few specially chosen hairs from the horse's tail and have them boiled. Then he would sit and hum while happily tying knot on knot in the horsehair sutures of his cleft lips.

W. L. Shearer was visiting one time and watched Blair at work until he could stand it no longer.

"Why is it, Dr. Blair, that you tie 6 knots in the horsehair each time?"

Whereupon Blair answered:

"Because 5 won't hold!"

Teacher

Blair was a great teacher, and among his early students were such famous names, along with James Barrett Brown, as William Hamm of Atlanta, Earl Padgett of Kansas City, Louis Byars and Frank McDowell of Saint Louis. Most of the men who became leaders in America at one time or another observed Blair at work. In fact, surgeons came from far and near. As Hector Marino of Buenos Aires, Argentina, recalls:

I remember seeing Old Papin Blair undo a lip two, three times because the result was not up to his artistic expectations. And, how he took his time to explain to his young assistant the unapparent little secrets of the trade that made all the difference in the end result.

Evidently it depended on his mood, for Gerald O'Connor of San Francisco recalls once asking Blair:

"Vilray, I have read your article 50 times but I noticed you did not explain how you make that beautiful alar sweep at the base of the cleft nostril. Could you explain how you do it and where the lining comes from?"

O'Connor said Blair rubbed his chin, looked him square in the eye and said:

"I don't know, Gerald, it just comes from experience."

Selling plastic wares in the marketplace

Realizing the importance of general doctors' knowing modern developments in plastic surgery, Blair set up a cleft lip exhibit on the famous Steel Pier in Atlantic City at the American Medical Association meeting in the mid 30's. He arranged an automatic slide projector to present each step of his operation. When his friend Robert Ivy sauntered by his demonstration, Blair called him over and they stood and watched the series of slides.

"You know, Bob, they accuse me of not showing every step of the operation. Now look, there is the original deformity, there the important marks are made, there are the incisions, there are the flaps being fitted into position, there is the final result with the sutures. What more do they want?"

"That's right, Vilray," said Ivy.

"Trouble is," admitted Blair with a twinkle, "the machine changes the slides too fast!"

A BOSTONIAN SOOTHSAYER

Varaztad H. Kazanjian of the Massachusetts General Hospital and Eye and Ear Infirmary was an astute Armenian who had served in World War I as a dentist in the Harvard Base Hospital Unit with the British Expeditionary Force in France and upon whom King George V conferred the Order of Companion of St. Michael and St. George. This pioneer of face and jaw wounds eventually became Professor of Plastic Surgery at Harvard University. His vast experience and sagacious observation in the trauma and healing of lips and maxillae prompted him in 1939 to lay down some wise criteria for making a choice of the primary lip procedure, whether it be, as he said, "Mirault, Blair, Rose, Husson, Thompson, Veau or Ladd," for these were the popular methods of this time,



Varaztad Kazanjian

*his principles
were more
right than
the methods
being used*

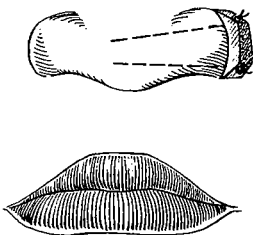
but the method that answers the following qualifications should be given preference:

- 1) It should involve a minimum of operative trauma.
- 2) The operative method should be designed toward bringing the separated parts into their normal anatomic position . . . so that when the child grows the lip will develop along normal outlines.
- 3) For the sake of the immediate result the procedure must not unnecessarily sacrifice skin tissue, because the excision of a piece of skin as small as one-quarter of an inch in length is equal to one-half an inch in length in adult life. A tense lip, besides lacking normal contours, causes undue pressure against the alveolar process of the upper jaw and becomes partially responsible for the retrusion of the upper jaw.
- 4) It must include correct approximation of the nostrils as an important element of the surgical problem.

A RETENTION SUTURE

To Blair's modification of the Mirault cleft lip procedure Cyril Callister of the University of Utah in 1948 added a special retention suture set to prevent the lateral creeping of the alar cartilage. After completion of the primary lip operation he inserted a soft rubber catheter to fit the constructed nostril on the cleft side. Then he passed a strong silkworm gut suture from the septum of the normal side through the catheter, on through the alar cartilage near its tip and laterally down and out through the skin at the base of the flaring ala on the cleft side. A split shot was crushed on the suture external to the alar base. This tube and shotted suture were left seven to eight days to protect the lip closure and to allow the dissected tissues to stick down in their corrected position. Of course, the effectiveness of this retention stitch as with most retention sutures lasts as long as the suture retains. After the removal of the stitch, if the operation was not designed to prevent alar cartilage creeping, the chances are there will be a surreptitious creeping back again.

McDowell's comments on this stitch are pertinent:

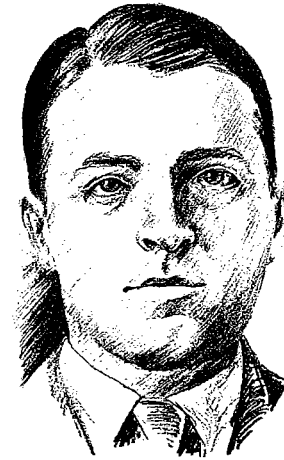


The retention suture attributed to Callister was used by Blair in the 1930's and 1940's as shown in a diagram from his 1930 S.G.O. paper. Blair usually used small lead plates on each end but sometimes split shots . . . and sometimes both. I had to squeeze the damned split shot on a number of them. Brown hated them. The results were zero.

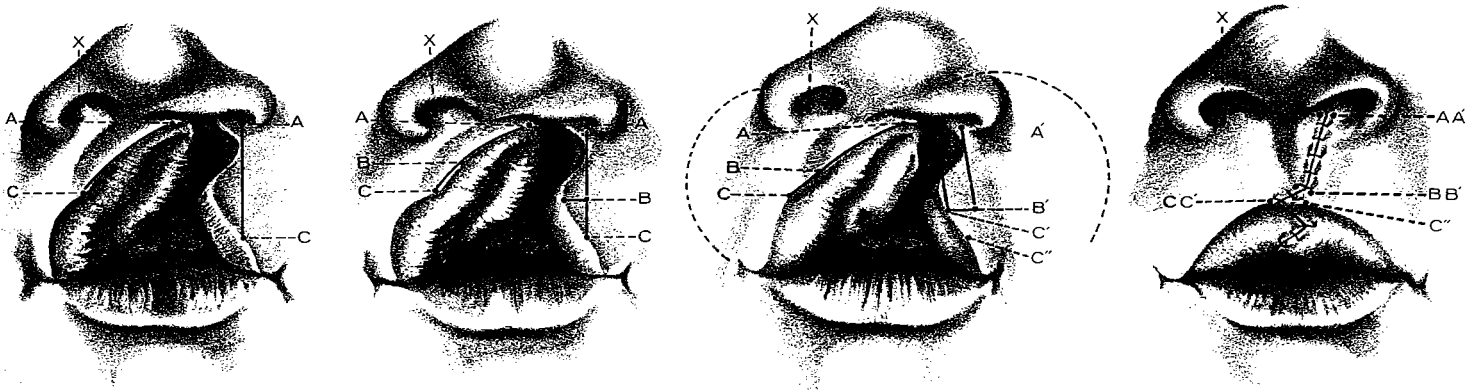
BROWN

James Barrett Brown, working with Blair since 1929, by 1945 had become dissatisfied with the original Mirault-Blair procedure that Blair and he described in 1930. With McDowell he explained:

The main principle of the operation remains just as desirable as ever but better results may be obtained by using a small flap to produce the fullness in only the lower one-third or one-fourth of the lip. . . . A repair with a large Mirault flap (one-half the length of the lip) may be better than a straight line repair, but is not so good as when a small flap is used. It is apt to present the following disadvantages: (1) the large flaps by their greater contraction are apt to lump up more and give a "trapdoor flap" effect; (2) it is necessary to sacrifice a greater amount of lip on both the cleft and columellar sides to fashion and fit in a large flap; (3) the break in the profile line where the forward thrust begins is in the midlip rather than down just about the vermilion border where it normally occurs.



James Barret Brown



Brown and McDowell continued:

This simplified plan of marking has facilitated the entire operation, has made the teaching of it easier, and has caused some interest to be developed by house surgeons who often appeared bored before.

MCDOWELL

Frank McDowell, one of the renowned St. Louis "four horsemen" and co-designer of the perfected triangular flap, reviewed the early days in 1972.

The great trouble with the Blair-Brown design was that all of the principal marks (A, B, C . . . and A', B', C' . . .) were tied in a way to each other but none were precisely related to the anatomy of the child in front of the surgeon and thus no clear indication was offered just where to put the marks. As a result many people have said they were doing the "Blair-



Frank McDowell

Brown operation," or the "Mirault operation" and they were actually doing something quite differently without realizing it.

Barrett and I worked years to develop an easily reproducible design with each mark precisely related to an anatomical landmark on the child. Secondly, after experimenting with hundreds of these (at one time we were doing lip closures for the Crippled Children's Divisions of 11 states) we found that a small triangular flap one-fourth of the length of the lip was far better than the half-lip flap that was used only for the first few years. The key to the precise design was the mark in the floor of the normal nostril (that X, not the old X down at the bottom of the vermilion). Once X is put in the same relationship to the columella as A is . . . then one has only to put A' in the same relationship to the cleft alar base as X is to the normal alar base. When this is done, and A is brought to A', it follows that the nostril floors on the two sides must be equal and the cleft nostril base will have to be in the same relation to the columella that the normal nostril base is. (The other marks are similarly assigned to fixed and easily determined positions.)

With these changes, we had almost a new operation and all of us for the last decades regarded this as the definitive version of the triangular flap operation (rather than the early abandoned one).

Curiously, Blair was never able to do what Brown, Byars or I would consider a really good lip repair—in spite of his interest and pride in it. Nor did he ever do very many. He was a genius in developing new concepts of his own and in quickly recognizing the worth of new concepts developed by others. Even 10 years before you knew him he wore gloves even longer than his large hands so that the fingers hung over the ends by half an inch, a floppy condition not conducive to delicate detail. But then he was never particularly good as a technician in doing little fine jobs.

McDowell is a rare combination of surgeon, encyclopedia, indexer, connoisseur and scribe. His writings were always formulated, as he said,

between the hours of 10 P.M. and 3 A.M. at a time when one is not competitive but reflective.

He did his nocturnal writing at 22 Kingsbury Place, St. Louis, in the second-floor study overlooking the central parkway which in winter was covered with snow and tinged yellow by the gas lights. During this time there was a little gray mouse who used to keep him company during these lonely hours. McDowell admits often crumbling crackers for the friendly rodent to show



his appreciation. When Mary McDowell found out about the mouse and was about to set a trap, Frank talked her out of it with

“But who else can keep me company at this hour?”

Here are a few of Frank’s most recent reflections.

I hope, Ralph, that you will state somewhere in your Book that the real test of any lip operation comes at about the age of 20 years in those patients who had wide total clefts repaired in infancy and who have had no operations since. This is not to say that secondary “touch-ups” should not be done, but for valid comparisons nothing will beat these. The usual history has been that each surgeon enthusiastically promotes the repair he is best at doing for about 15 years and when the results start to develop deformities, he jumps over to the newest and most popular repair of that moment—with no assurance whatsoever that the late results of this new procedure will not be even worse.

In comparing results of various operations, it is important to emphasize that the reader should compare the best results obtained by the few surgeons superior at each type of repair (making sure, of course, that they started with clefts of equal severity). There is no limit to the poorness on the downside; the only valid test is “How good are the best when the child is grown?” (and I am sure that none done by any method will be perfect).

*I have
tried to
follow this
suggestion*

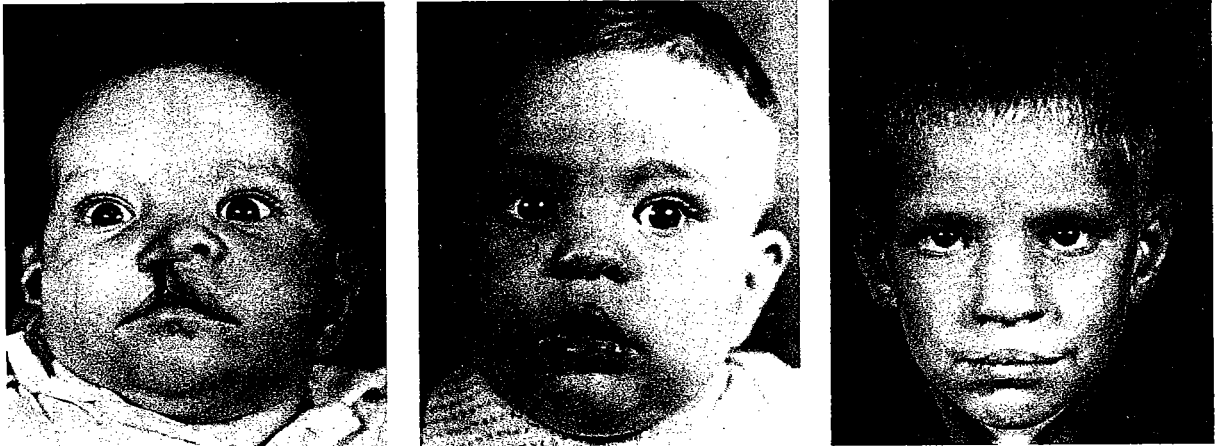
As suggested by McDowell, here are examples of the ultimate that he was able to achieve with his perfected triangular flap. An incomplete cleft is shown but with only an early follow-up.



The lip is o.k., good rotation of the nostril, didn't get dome of nostril up as well as in some.

This lip was mended in 1943 and should receive a high grade for its time in the evolution of cleft lip surgery. In fact, it is better than many of the "would-be sophisticated" methods of today.

A complete cleft operation by McDowell in 1957 did achieve excellent nasal correction, but the horizontal length of the lip from commissure to midpoint is short on the cleft side at six months and at six years still has this discrepancy plus an upside-down bow.



NO BOW

A cardinal criticism of the principle of all modifications of this Mirault-Blair-Brown-McDowell method has been that the final result was without the normal cupid's bow. Brown acknowledged the lack of a bow with one of his aphorisms,

Only God can make a cupid's bow,

and then rationalized the discrepancy:

The slight upward prolongation of the vermilion beneath the philtrum on either side, commonly known as a "cupid's bow," is present in some normal lips, but almost absent in others. The desire for it, among women, seems to vary with other fashion trends. Various operations have been proposed to create it in the cleft lip, most of them involving incisions opening up almost the entire mucocutaneous border, either at the primary operation or secondarily, and substituting a long scar for this normal soft undulation of tissue. It is thought that the resultant scar of these operations, in some instances, may be more deformity than the absence of the "bow." Men seem to care little for the "bow," women are apt to be undecided,

*A cut at
Gillies'
bow
operation*

and it seems too ephemeral to be the object of an operation in most instances. It can be artificially suggested by very thin areas of tattooing, or in women by the use of lipstick.

Twenty years later (in 1966) Frank McDowell, editor of *Plastic and Reconstructive Surgery*, redefended this discrepancy with a skilled pen:

There will probably always be surgeons who feel that the "cupid's bow" is a desirable goal, and other surgeons who feel that it is something to avoid in ages and sexes other than teenaged females.

It is true that the exaggerated cupid's bow sported in the gay 20's by such movie stars as Clara Bow and later cartooned as Betty Boop is no longer in vogue. Yet the soft undulating curves of the normal lip's bow are desirable in any sex, any age, any time.



ROOTS AND STUMPS IN ST. LOUIS

Once in the study of plastic surgery it was inevitable that I would take at least a portion of my training in St. Louis. My grandfather, C. D. P. Hamilton, the original leather expert for the International Shoe Company, had been enticed from Easton, Pennsylvania, to St. Louis in 1899 when it was still a boomtown. Born at Barnes Hospital, I returned there 30 years later as a house officer during the first half of 1950. It was difficult not to be extremely impressed by the simple direct execution by masterful surgeons of the Brown-McDowell modification. When the baby was wheeled out of the operating room with mattress sutures through the external nasal skin tied over bolsters and the flattened nostril molded round with packing, the immediate result was no less than dramatic. Yet, unlike the other loyal residents, I had learned from Gillies that a lift gained by mattress sutures to hold up a flattened alar dome could be expected to last no longer than the sutures or the packing. I must have verbalized this from time to time.

It was exciting to have trained even for a short time with the great team of Brown, Byars, McDowell and Fryer of 400

Metropolitan Building. Unfortunately, I was not one of Brown's favorite house officers, but, like so many others, I gained from his didactic teaching—"the optimum time to operate a cleft lip is the first time." This dynamic native of Mark Twain's sleepy little hamlet of Hannibal, Missouri, probably had a boyhood that evoked the adventures of Tom Sawyer and Huckleberry Finn. He was a paradox of virtues, with intense likes and dislikes, an intolerance of others' methods and mistakes and yet not without a touch of Twainian humor. He loved strawberries, Beethoven and St. Louis and idolized a special favorite of many of us, the dexterous faker and humorous plastic problem, W. C. Fields.



Frank McDowell, who knew Brown best and considered him a king, wrote after his death:

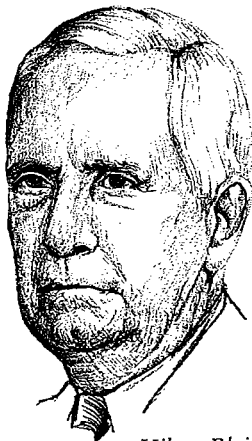
The boyish twinkle in his eyes, present until his last working day, effectively punctured pomposity on sight.

This trait was exemplified by a story told by Lieutenant General Hal B. Jennings, Jr., Surgeon General of the U.S. Army, who had trained with Barrett Brown in 1950. Colonel Brown was being commended enthusiastically by Major General John Hurd for his fine work on the war-wounded at Valley Forge during World War II.

"I can say in all reverence that never since the time of Christ have such miracles of healing been seen upon this earth."

Whereupon Colonel Brown, not displeased, replied:

"God still does the healing, General, we surgeons merely rearrange the details."



Vilray Blair

A FEW WORDS WITH BLAIR

A true highlight of my St. Louis experience was a chance to dine one evening with the renowned, and at this time retired, Vilray Blair. Tall, white-haired and with a quiet gentleness, he listened with sympathetic patience to my questions about plastic surgery. Mindful of his many pioneering feats in head and neck surgery, I asked him:

“Dr. Blair, of all your many contributions to the specialty of plastic surgery which one is your favorite?”

He had a glint in his eye when he answered:

“My cleft lip operation, the modification of the old Mirault procedure which we published in the thirties.”

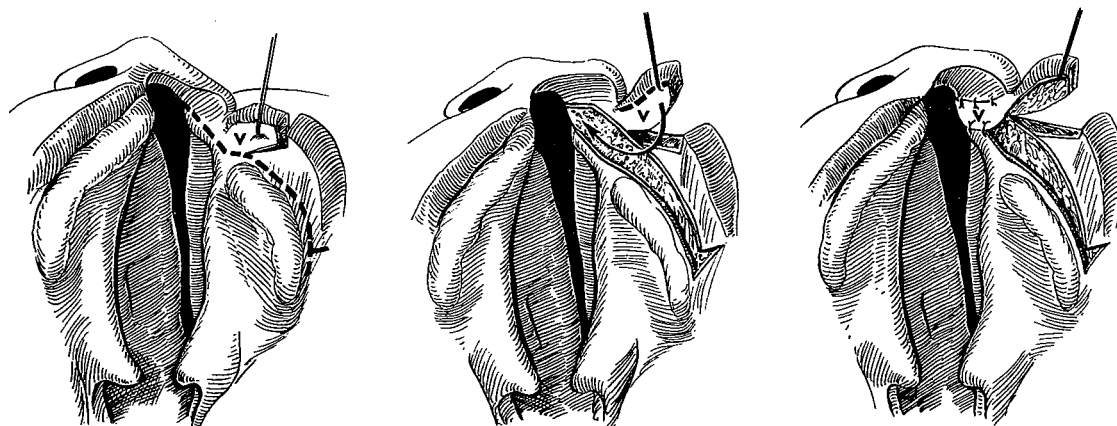
INTERNATIONAL PROGRESS

Of course, the advance brought about by the high standards in St. Louis was caught up in other centers. There was a time in the 40's when the Blair-Brown-McDowell lip operation was used almost universally. Such great centers as Truman Blocker's University of Texas unit at Galveston and A. B. Wallace's unit in Edinburgh used the method exclusively.

Along with its worldwide acceptance new advances began to evolve. Take, for instance, the matador's cape trick perfected in a Spanish surgical arena. Lorenzo Mir y Mir of the Medical School of Barcelona indicated in 1955 in Stockholm that he was convinced that the secondary retraction of the alar base was the result of contraction of the raw area created during the releasing incision which extended from the gingival groove upward through the lateral nasal lining in front of the inferior turbinate. He proposed the use of a mucosal flap salvaged from tissue usually discarded in the Mirault-Blair method which, when whirled like a red cape up into the nose, covered the lateral defect and interrupted potential contracture. This was an *important first!*



Lorenzo Mir y Mir



IMPERSONAL EVALUATION

In the fall of 1962, all plastic surgeons of the United States and Canada were sent a questionnaire on facial clefts, and from the 54 percent response Michael Lewin reported that the Mirault-Blair-Brown-McDowell procedure had lost popularity in the last decade, with only 13.9 percent of the surgeons acknowledging present use of it.

Probable reasons for the decline were outlined by Musgrave for Converse in 1964:

There is too much central vermilion discarded, no cupid's bow is salvaged and as the child grows older the upper lip frequently appears tight and the vermilion border thin.

MORE PERSONAL

Since those earlier days as a resident in St. Louis I have had an opportunity to see truly long-term follow-up results of cases operated on by the Brown-McDowell simplified method, some by inept surgeons but others even by an author of the method. My observations were corroborated in 1966 by McDowell's "twenty-year" follow-ups. Although some results are pleasing, it seems fair to say that, in general, the nose often still has a slight slump with asymmetrical flattening of the tip. The lip is scarred in an unnatural position without a philtrum or a dimple. Instead of the natural cupid's bow with its twin peaks, there is often an asymmetrical single peak. A varying degree of tubercle at the vermilion interdigitation is just off-center to the cleft side. The most serious deformity, which seems to occur often in complete clefts, is a relative side-to-side tightness of the lip's free border that exaggerates a protuberant lower lip. The problem is understandable as all the flap action occurs in the lower one-third of the lip. On the medial side the paring of mucosa is carried so far along the edge that when the lateral triangular flap advances to fit this freshening some tension is created. It actually causes gathering of the malleable free border tighter than is desirable, requiring radical secondary correction later. How this is best done is discussed in the Secondary section.