

## 57. *Habilitation*

FOR many years most cleft palate patients were operated on by general surgeons, dental surgeons or, if they were lucky, plastic surgeons, and that was the end of it. Merely by chance, the dentists faced the results, and occasionally a speech therapist was called in for aid. If, 23 years ago at Duke University, 65 percent of cleft palate cases had no orthodontia and 75 percent had no speech therapy, imagine what was happening in the hills of Tennessee or down in the Ozarks.

In the 30's, 40's and 50's, when St. Louis, with Barnes and Children's Hospitals of Washington University School of Medicine, was the American cleft lip and palate mecca, the surgeons totally ruled the handling of clefts. It would be somewhat chilling for me to visualize an orthodontist or a speech pathologist criticizing Barrett Brown's palate results or dictating his timing or choice of surgery. As I remember, Brown was so "busy" he could never have sat for several hours with a "team" listening to other specialists' opinion of his work. Thus, there was a one-way communication on the cleft cases, but that is not to say the aid of the dentist and the speech therapist was not sought. This is how Frank McDowell recalled those days:

When done successfully in one palate operation at 18 months, about two-thirds of these would spontaneously develop normal speech. About one-third had varying degrees of speech abnormalities—and they represented the real problem. The best solution to it was, we felt, via a careful speech analysis at about the age of 5 years by a speech pathologist who was a specialist in cleft palate speech problems. This person could then pinpoint the exact problems the child was having, prescribe the exact things the child needed to work on, then assign him to a specific teacher for individual

lessons to overcome these specific shortcomings. There were check-ups by the pathologist at about 6-month intervals to see how much progress was being made and which exercises could be dropped. This, together with skilled orthodontic care, got rid of nearly all (but not *all*) the speech problems. The main problem, of course, was in those children who came from a distance, who had speech problems, and who did not have these skilled personnel available to them. If it was only a couple of hundred miles, we insisted they make the trip every week.

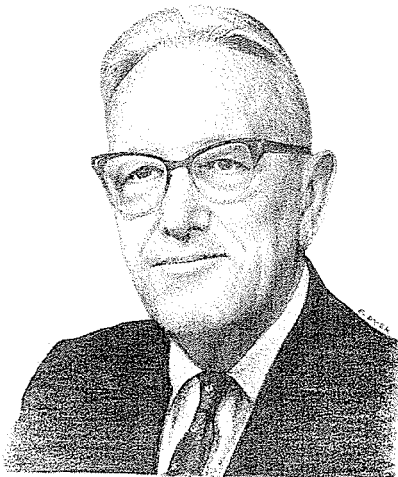
There were also some dropouts—and one of our main functions was to try and get lackadaisical parents of children with speech problems to see how important this therapy was. Too often, for convenience, they would want to enroll them in their local school program—which was usually class therapy for stammering and made the cleft palate children worse. We had to fight this and get them to see that individual private lessons were more important than another car or another TV set.

### TEAM APPROACH

In 1966 Robert H. Ivy reviewed the history of the team approach in the management of cleft lip and palate:

It is readily understood that in that period mentioned, the treatment of cleft lip and cleft palate was carried out in a very haphazard manner; almost every general surgeon had a part in it, in addition to a handful of men more or less qualified as specialists in the field.

In Pennsylvania, as time went on, certain dentists were manifesting a special interest in the dental problems involved. During these years, we began to hear more and more of Dr. Herbert K. Cooper of Lancaster, an orthodontist who had been confronted with the problem of handling many cases of unsuccessful surgery, and other cases where surgery had accomplished everything possible, but which still, to be complete, required extensive mouth rehabilitation. Some time around 1938, Dr. Cooper, in an effort to cope with some of the financial problems involved, sought and obtained the support of the Lancaster Rotary Club. Through his extraordinary talent in the professional and administrative fields, this venture culminated in the establishment of the Lancaster Cleft Palate Clinic.



*Herbert Cooper*

At this time the secretary of health of the Commonwealth of Pennsylvania recognized that cleft lip and palate should be included in the State Crippled Children's Program. It was also proposed that, as soon as feasible, besides surgery, the program should include general dental care, orthodontics, prosthodontia

and speech therapy. Meanwhile, at the Lancaster Clinic, the underlying philosophy of the present-day complete cleft palate management was being developed under the direction of H. K. Cooper. This was in the form of an integrated team approach by a group of clinicians representing the several interested specialties.

Since those early days, *cleft palate teams* have formed in most major medical centers with better overall care for the patient. It is interesting to follow to the end the method of habilitation developed by descendants of the St. Louis dynasty. One of the important organizers in the field of cleft lip and palate is William C. Trier, who is motivated toward the team approach because of the tremendously satisfying feeling that the patient with a complex problem is having all of his needs met.

Trier, trained by Brown, Byars and McDowell in St. Louis, reminisced in 1977:

My training in plastic surgery gave me an opportunity to observe the care of children with cleft lip and palate solely by the surgeon. Although there was telephone or written communication with the orthodontist and, I presume, the speech pathologist, there was no opportunity for even these three disciplines to meet together to diagnose, plan treatment, evaluate each case.

Trier returned to the U.S. Navy and found no cleft palate team there. In five years, when he followed Joe Connelly as chief of plastic surgery at the National Navy Medical Center in Bethesda, he retained the cooperation of orthodontist Peter Cocarro of NIDR and induced Jim Lore, speech pathologist and psychologist, to form a team. Upon retirement from the Navy, he joined Erle Peacock (also trained in St. Louis), who was chief at the University of North Carolina. Trier summarized:

Among other exciting things, this gave me the opportunity to join a first-class cleft palate team. This team had begun modestly when Erle recruited a speech pathologist, rented a house in Chapel Hill with a housemother, and conducted the first Summer Resident session for seven children. The kids were entertained royally by the townspeople of Chapel Hill, got rides on the fire engine, swam in the University pool and also underwent intensive individual and group speech therapy. In the following year, Don Warren joined the faculty in the School of Dentistry and he and



William Trier

Erle established a real team with the various dental specialists, pediatric and ENT support and moved the program to Story Book Farm, a camp for children on the outskirts of Chapel Hill.

There are two basic operational elements to the program. The first is a diagnostic and evaluation aspect including dental, plastic surgery, pediatrics, otolaryngology, psychology, speech pathology and social services study. The patients are presented at a weekly conference attended by all the disciplines where a summary of their findings and recommendations are presented and plan of treatment decided. I then meet with the family after the conference and outline the plan for the child.

The other major element to the program is the resident sessions held each spring and fall. The Chapel Hill school district provides a full-time school teacher who conducts an intensive academic program providing individual intensive speech treatment each week for the ten-week session. Many of the children also receive needed outpatient dental treatment during the resident session and frequently secondary surgical procedures are performed at the end of the session or even far enough in advance of the session to allow its evaluation.



*Cloyd Harkins*

#### MIAMI TEAM

Miami formed one of the relatively early cleft palate teams in 1951, when prosthodontist Cloyd Harkins came and lectured at Lindsay Hopkins Educational Center on the value of prosthetics to postpone palatal surgery. After this, the South Florida Cleft Palate team was formed and led by prosthodontist Norman Alley, including pedodontist Herman Anderson, orthodontist Robert Litowitz, pediatric surgeon Robert Dickey and, later, speech pathologist Betty Phillips. After a few years, prosthodontist George Balber became chairman and the clinics were held at Variety Children's Hospital. In 1968, when Balber resigned, I was elected to replace him and the clinic was moved to Jackson Memorial Hospital and, eventually, to the Mailman Center for Child Development, where it meets regularly every Tuesday from 9:00 to 11:30 to evaluate, on the average, seven cases a week. Since 1968 Evelyn Shields has been our super-secretary. Many fine specialists have served on this team over the past 10 years, as seen in this photograph taken in 1978:





1. A. Goldenberg, orthod.
2. C. Cabesa, audiol.
3. G. Cubicciotti, vis'g p.s.
4. E. Shields, sec'y
5. S. Berkowitz, orthod.
6. R. Litowitz, orthod.
7. A. Wolfe, p.s. (cr-fac.)
8. W. Dickson, anat., sp. & h.
9. J. Bensen, speech
10. D. Dickson, anat., sp. & h.
11. G. Sinko, speech
12. F. Pullen, e.n.t.
13. W. Mullin, p.s.
14. R. Millard, p.s.
15. Mother and patient

*Residents' row:*

16. F. Freshwater
17. R. Zaworski
18. S. Spear
19. F. Mergen

*Absent:*

- B. Segall, prosthod.
- J. Riley, speech
- A. Earley, audiol.
- D. Crampton, pediater.

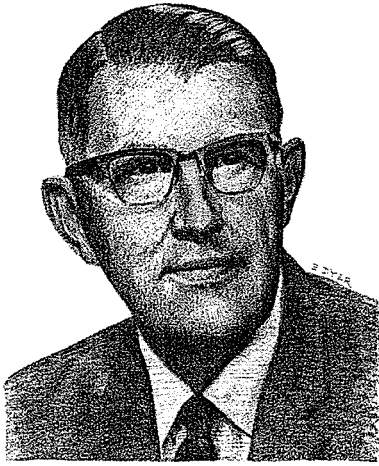
### *My early dream*

As a camp counselor and later as director of my own athletic day camp, I realized the value of early training of special sports skills to young boys. By 1945, when I became interested in cleft surgery, it was my plan to create a special camp for cleft children where they could enjoy the learning of certain skills, gain the confidence such mastery brings and thus offset their apparent handicap. This camp was to have a dentist and speech pathologist, besides a cowboy, and athletes as counselors. Although I have not entirely given up the camp dream, I find that all my time and energy are being sapped in the concentrated effort to bring cleft infants to attractively functioning and appearing adults, which leaves little time or energy to teach a kid, except my own, the Texas skip, an arm roll or a right cross. I do request the cleft patients' parents to encourage, instruct or seek instruction in special skills for their children, and under no circumstances to withhold them from any sport to which they are attracted!

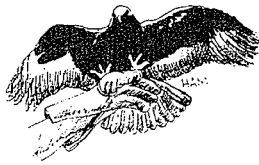
In 1976 orthodontist Howard Aduss of the University of Illinois Medical Center synopsised the value of the team:

We are now seeing young adults who are the product of what has come to be known as "the team approach" to the treatment of clefts. On balance, this system has resulted in better treatment, fewer complications, and less deformity. At the same time, and most importantly, the clinician functioning within the environment of the team has not lost his individuality or freedom to innovate, but has developed new techniques based on input from this interface with other team members.

## AN ANALYSIS OF THE TEAM



Herbert Koepf-Baker



Herbert Koepf-Baker of Southern Illinois University, Carbondale, who incidentally has been a falconer for 30 years training and flying peregrine falcons, gyrfalcons, goshawks, eagles and American redtails in many parts of the world, also has had an interest in cleft palate. At the age of 10 years, on a farm in remote northern Michigan, he heard a cleft palate person speak, and after his mother explained, "Lawrence's mouth does not have a roof," he became intrigued. Years later in Pennsylvania he worked with Cloyd Harkins, experimenting in constructing and fitting prosthetic speech aids for young and old cleft palate patients. In 1978 he recalled from North Carolina:

Harkins and I taught the first formal course in prosthetic rehabilitation of cleft palate patients for a group of 25 dentists, surgeons, speech pathologists, nurses and social workers, and at the final meeting of the course the class determined to organize, becoming the Academy of Cleft Palate Prosthesis—later to become the American Cleft Palate Association. This is probably the earliest interdisciplinary effort in the field of orofacial disorders.

In 1971, in *Cleft Lip and Palate*, Koepf-Baker wrote on the cleft palate team. Here are highlights:

An impressive feature of congenital craniofacial deformities is the multiplicity of functional impairment which they induce. The primary goal in the treatment of children with these disorders is the reduction of the disabilities which attend them, and the alleviation of the personal and social handicap they impose. . . . The clinical team is a logical response to this need. . . . [It] makes possible a diagnosis derived from broader and more accurate sources of information, and more representative judgments and decisions. . . . [The roster of specialists] may involve: audiology, clinical psychology, plastic and reconstructive surgery, medical-social work, orthodontics (dento-facial orthopedics), otology, pediatrics, pedodontics (general dentistry for children), prosthodontics, and speech pathology. . . . There is little room for exclusive authoritarianism in clinical leadership. . . . Ennui can be the team's most insidious disease. But it can be prevented by the early and continuing recognition that a cleft palate team can be and must be more than the conventional "medical conference." . . . There are actually two measures which recommend themselves: research and continuing education. . . . Orderly, disciplined scientific investigation, if properly employed, can transfuse the team organism. New and stimulating ideas and

fresh, challenging information and point of view are critically essential. Properly controlled research recharges the team's flagging batteries. . . . There is also the urgent need for enlarged bases of communication in the team through continuing education. . . . I am constrained to make an important concluding point . . . . I have come to regard the word *multidisciplinary* as reflecting the quality of immaturity. The proper term describing the mature and effective team, as I conceive it, is *interdisciplinary*. It better suggests the attribute of interpersonal and interprofessional interaction that distinguishes this form of human enterprise.

Of course, when it is all added up, it is the surgeon in the operating room who wins or loses the game in each case. The choice of his surgery and its timing must be influenced by the facts about results seen in the orthodontist's models and the speech results as analyzed and aided by the speech pathologist and the radiologist.

#### SPEECH THERAPY

A most important aspect of postoperative palate habilitation is speech therapy. As early as 1889, Billroth had a remarkably clear understanding of cleft palate speech. As translated by Clodius, he wrote:

Dr. R. Coën lets the patients read. He reports upon the status of speech, as regards which sounds were pronounced normal and which defective, before he starts instructions. Speech therapy consisted of making the patients read loudly and especially to accent the vowels, thus training the muscles. The sounds formed in the anterior oral cavity were pronounced more easily than the ones originating from the posterior oral cavity. The voiceless sounds were more difficult to pronounce than the voiced; the plosives were less distinct than the hissing sounds. /L/ is uttered most easily, /G/ with most difficulty.

Professor Exner mentions the physiological interest of these cases, because the adults, like children, must learn to speak. As opposed to the children, however, their disadvantage consists of the fact that the adults have to forget their previous language and innervation feelings and acquire new ones.

There are several books and numerous book sections devoted specifically to the subject of speech therapy. It has been my good fortune to know three "prima ballerinas" of the speech specialty:



Muriel Morley

Muriel Morley of Newcastle, Madame Borel-Maisonny of Paris, and Betty Jane McWilliams of Pittsburgh.

### *Morley*

Muriel Morley, speech pathologist for Wardill and later Braithwaite in Newcastle upon Tyne, England, has written a classic little book, *Cleft Palate and Speech*, now in its seventh edition. Here are some of her reminiscences in 1976:

It is the nature and the prerogative of the elderly to look back over the years and perhaps to see events in a perspective which is impossible to the young and to those actively involved in creating new events.

In the middle of the 1920s, a young surgeon, William E. M. Wardill, in Newcastle upon Tyne, became interested in and concerned about the social problems facing those with abnormal, and frequently unintelligible, speech due to a cleft palate, both before and after surgery. Wardill was one of the first surgeons to give time to the follow-up of his patients and to a careful study of the speech results he was obtaining. It was at this time that we first met, and I was invited to help with the speech therapy of his patients. For the next fifteen years or so, during the 1930s and 1940s, various operative procedures were devised, aimed to produce raised scar tissue on the posterior pharyngeal wall, to narrow the pharynx and to lengthen the velum, to improve the mobility of the velum and to reduce the formation of scar tissue of the palate. Many surgeons were now operating upon children in infancy, as it was thought that if successful surgery were carried out before the child began to speak, faulty patterns of articulation would not develop. As many general surgeons continued to operate on this condition, some of the failure to the subsequent development of normal speech could be attributed to the formation of scar tissue, causing contraction and immobility of the palate and deformities of palatal growth. This led to a theory, put forward at the end of the 1940s, that early surgery could damage the growing points of the palate, and that surgery should be postponed until growth had continued to 7 or 8 years of age. The argument amongst surgeons concerning the optimum age for surgical treatment lasted well into the 1960s. However, many plastic surgeons were obtaining good results by operating in infancy and continued to do so. One of these was Fenton Braithwaite, who succeeded William Wardill in Newcastle upon Tyne.

*It still rages today!*

Braithwaite, when operating on a lip, felt the essential aim was to unite the tissues as nature intended them to be and to leave growth, stimulated by muscle activity, to complete the process. He applied the same principles to the surgical repair of the palate. Braithwaite rarely used a pharyngoplasty and never as a primary procedure, as he aimed to avoid damage to the



mobility of the posterior pharyngeal wall. He used lateral incisions of the palate within the alveolar margins, which were carried posteriorly around the lateral walls of the pharynx and partially behind the posterior pharyngeal wall. This allowed the lateral walls of the pharynx and the elements of the palate to approach the midline, so that the soft palate could be sutured without any tension, thus again producing a muscle transplant of the lateral pharyngeal muscles. The optimum time for this operation was considered to be around the end of the first year of life.

Within a few days of birth, the normal reflex co-ordinations for sucking and swallowing become established. However, children begin to develop the co-ordinations for speech through vocalising and babbling, and certainly from the sixth month, these tend to become increasingly established and are necessarily abnormal in the child with a cleft palate. These faulty co-ordinations, in the control of the oral and nasopharyngeal outlets with lip and tongue movements, also tend to improve postoperatively, but if operation is postponed until speech is fully established in both its sensory and motor aspects it becomes increasingly unlikely that these patterns of articulation will change spontaneously. However, the majority of those operated upon at the optimum time (before 3 years) were observed to develop normal speech rapidly, or more gradually, without any specialised help. Continuing observation every six months showed that 97% of the children had adequate physiological control of the nasopharyngeal airway postoperatively, the majority of whom developed normal speech which persisted into later life.

Certain problems arose, however, during growth. It was necessary to watch for any hearing problems which might be sufficient to hinder speech development. There were also children in whom the interference with the normal development of the palate had occurred so early in its growth in pregnancy that there was only minimal development of palatal tissues, too limited for any operative procedure to be entirely successful at the first attempt. Some children need help in acquiring the requisite co-ordinations and control of the nasopharyngeal airway and articulation, and especially if associated with mental retardation and also when operation had been postponed until fluent speech had become fully established. There were also certain children with no palatal abnormality who have difficulty in establishing the normal phonology for intelligible and normal speech. Some such children will also be found amongst any group of children with clefts of the palate. Such children will have greater difficulty postoperatively acquiring the normal muscle movements and co-ordinations of the lips, tongue, palate and pharynx, and in developing normal articulation when the anatomical and physiological conditions are adequate.

These are my personal experiences, particularly in working from 1932 until 1963 with two eminent plastic surgeons in Newcastle upon Tyne. It



Betty McWilliams

yes !!

has been an interesting experience to observe the development of the treatment for this condition over a period of forty years and its gradual improvement until surgery can now achieve a functional result in most of these children.

### *McWilliams*

Dynamic and articulate Betty Jane McWilliams, speech pathologist and director, Cleft Palate Center, University of Pittsburgh, in 1976 wrote some pertinent general observations:

1. Speech therapy is not for everyone and everyone is not for speech therapy.
2. Speech therapy is no substitute for an inadequate velopharyngeal valving mechanism.
3. It is a national disgrace that so many children with inadequate velopharyngeal valving mechanisms are being subjected to years of speech therapy that has no chance of succeeding. Steps must be taken to assure that all children with this problem get the kind of diagnostic and treatment services which they require.
4. A geographical accident appears to be responsible for determining whether children are going to have adequate management for cleft lip and palate or whether they are going to be made worse by inadequate treatment procedures.
5. The plastic surgeon is the key man on the cleft palate team because he is the only one who can restore structures to what they ought to be.
6. The speech clinician can rarely claim the credit for a cleft child who speaks normally. We are primarily diagnosticians and assessors of outcome and must rely, for the most part, upon others to provide mechanisms that will support normal speech.
7. Feeding need not be a severe problem for children with clefts, but it often is because professionals are inadequately equipped to provide instruction to parents.
8. Breast feeding need not be impossible for the child with palatal defects. It is difficult but it can be done. More attention needs to be focused on this interesting area.

Then in 1977 she discussed speech problems associated with cleft palate:

It has taken generations of surgeons and speech pathologists working together (not always in the warm harmony implied in the discussions of "team interaction" written by Pollyanna and her successors) to realize that there is no such thing as a "typical" speech pattern associated with cleft

palate. The literature has, in fact, often rendered a disservice to children with clefts and the professionals who treat them by failing to come to terms with the beautiful reality of essentially normal speech in at least 75 percent of cleft children who are adequately treated from birth (Morris). The tragedy of this failure to state that excellent speech is the "expected" outcome, primarily from surgery alone, is that those with a success rate of zero are really not being challenged to take an honest look at their grim results. Thus, unnecessary human disasters continue to occur. We all share some of the responsibility for this—even though these events, of course, occur only in a vague place which we know as "Elsewhere, U.S.A."! Why don't we simply admit that we are seeking normal speech, that we are very often successfully achieving it, and that *all* children with clefts are really entitled to this "equal opportunity"?

Responsibility for these remarkable advances in "cleft craft" belongs primarily to the surgeon. An information base on velopharyngeal closure has been contributed by speech pathologists, and speech pathologists have forced surgeons to new objectivity in assessing their results. However, the beautiful speech demonstrated by many children with palatal clefts is almost *never* the result of speech therapy *per se*. On the other hand, the surgeon can no longer blame his poor results on poor speech therapy and expect the speech pathologist to accept the verdict and the subsequent guilt without bringing into question the adequacy of the velopharyngeal valving mechanism and the possible role of other factors which may contribute to speech problems and to which cleft children seem to be particularly prone.

Among those factors, we consider very early in infancy the potential role of the almost universal otitis media found in children with cleft palate. Early treatment and adequate control of this condition appear to have a positive effect upon expressive language development which many studies have shown to be somewhat slow in pre-school children with clefts (McWilliams; Shames and Rubin; Smith). A part of the expressive language deficit, however, seems to be related to *willingness* to talk rather than to an actual disability. This has been shown with little children whose habitual sentence length was short and who usually showed less complexity than would be desirable but who could, when they were sufficiently comfortable, use the longer and more complex sentences appropriate to their life ages. Thus, while language disorders may occur in cleft children, the danger of wrong diagnosis is apparent. Nursery schools often have much to offer the average cleft child whose middle ear disease is well controlled but who needs to be stimulated to talk as well as he is able.

Another speech problem which cleft children often have is a delay in consonant articulation development. These delays are not necessarily directly related to the original deformity, but our own simplistic approaches to

problem-solving often lead us to treat the wrong thing. A seven-year-old boy is a case in point. He had no hypernasality, nasal escape, nasal turbulence, or other oral-nasal resonance imbalance. His articulation pattern, however, was immature with the substitution of w/r, l; f/θ; and d/ð. He reported that he was in "speech cwass" and that he was doing "bwoing exocises" because he had "a cweft pawate" and had to "stwengfen de muscles" of his "fwoat." His articulation disorder went untreated because the clinician erroneously assumed that his speech problems must surely spring from poor velopharyngeal valving and that blowing was the best way to help him improve. The clinician thus failed to relate to the aspect of his verbal output that required modification. Little harm was probably done, but it was an expensive error in terms of money, time, and emotional investment. And the poor clinician was destined to failure, a failure sometimes unfortunately obscured by the passage of time, one of the primary modifiers of all kinds of early childhood behavior. We often look like experts because we fail to give credit to Nature's provision for maturation.

We must be aware, too, of the ever-present maxillary problems, including missing teeth and crossbites, that influence tongue behavior and may lead a child to develop a lateral lisp. This deviant channeling of air for sibilants is confusing to many listeners because they can't distinguish between the type of error and the sound that accompanies velopharyngeal inadequacy. Both arise from deviations in the air stream for speech. When this happens, sometimes pharyngeal flaps are done. The child *still* has his problems obviously, and the surgeon may secretly feel like a failure—as does the speech pathologist who ignores structure. The orthodontist has much to offer such patients.

Another problem of a similar nature is the anterior oronasal fistula, which, most of the time, is asymptomatic. Once in a while, it will occur in the rugae, and the patient will use the channel to produce sibilants. When he does, he will usually have massive nasal escape even though his velopharyngeal valving mechanism is just what the surgeon ordered. Closing the fistula with dental wax (or chewing gum) will often reveal that sibilants can't be produced at all without that fistula. What sounded like a posterior problem can now be understood as an anterior one, and the solution is clear. I confess that we are very much aware of this kind of problem *now*. Once, we were *close* to the door of the operating room to carry out a pharyngeal flap on a seven-year-old who thought we knew what we were talking about.

There are really hundreds of things that plague the speech pathologist. Since speech pathologists, in turn, plague the surgeons—or should—these matters are also of concern to surgeons. Hoarse voice is one of these. A ten-year-old boy with a repaired cleft on the soft palate and normal speech in spite of mild inaudible nasal escape on sibilants is such a case. When he was asked to participate in a research project, he arrived with his father,

who said immediately, "I could hardly wait to come. Just listen to his speech!" In the six months since he had last been seen, he had experienced a growth spurt, and his voice had become hoarse. Nasal escape was still present, but there was no increase in hypernasality. Videofluoroscopic examinations revealed that his borderline valving mechanism *almost* closed but never quite accomplished the task. He was exerting every effort to maintain the speech he had once had, and he was sacrificing his vocal cords in order to do so. Laryngoscopic examination revealed large bilateral vocal cord nodules (McWilliams et al). A pharyngeal flap was constructed, and the voice quality gradually returned to normal as the nodules diminished.

Then there are the children who really do have velopharyngeal inadequacy. If honest confession is good for the soul, then I should feel great after confessing that I don't think I have much to offer such a patient once the diagnostic work is completed. There are thousands of children and millions of dollars being invested each year in programs of speech therapy that haven't a prayer of succeeding until velopharyngeal closure—or something *very* close to it—becomes an anatomic and physiological possibility. Fortunately, now, the surgeon can often accomplish this with one of several techniques, usually a properly designed and executed pharyngeal flap. Sometimes, the prosthodontist must be called upon; and everybody has to settle for an appliance that will become a lifetime project for the patient. But that's better than communicative failure which will very probably persist no matter how much speech therapy is undertaken until that complicated and vital valve can work to separate the nose from the mouth.

I hope all of this has not sounded too pessimistic. However, I think it is important to face up to human limitations, and speech pathologists have them! We *can* contribute to the diagnostic process and see what needs to be accomplished if the patient's speech is to improve. We can help to change behavior that is *not* the result of insurmountable structural or motor problems. I even think we can assist the surgeon in evaluating the true nature of his results—an absolutely essential activity if we are to assure all children everywhere of the best possible speech. Fortunately, most plastic surgeons mirror these concerns, and valuable working relationships emerge and are maintained as a result.

### *Yules*

Controversial Richard B. Yules of Worcester, Massachusetts, ever since his inspiring year with Robert Chase at Stanford University, has been interested in the postoperative speech aspect of cleft palate and has perhaps carried it a bit farther. In 1970 he wrote in *Plastic and Reconstructive Surgery*:



*Richard Yules*

Speech therapy is an integral part of the team management . . . but all too often the speech therapist has been the scapegoat for ego-deflated surgeons. Indication for one or the other therapy was sometimes based on who saw the patient first, rather than on a rational selection method. . . . Only recently have cinefluorography and respiratory data suggested that certain categories of patients may be totally correctable with speech therapy alone—while others require mechanical intervention.

Although some speech pathologists regard nasal emission generally as articulatory deviation [D. C. Spriestersbach; D. Sherman], it is possible to distinguish some articulation problems for therapy before hypernasality is eliminated. Conversely, therapy can be oriented toward elimination of hypernasality which, once achieved, makes articulation errors easier to correct. Although some comprehensive contemporary publications deny “that motor exercises are of value for increasing velopharyngeal competence,” other speech pathologists find “therapeutic exercise and velopharyngeal gap” to be related. Surgical researchers have succeeded in training patients to constrict their circumpharyngeal sphincter voluntarily, getting them to condition this new-found pharyngeal aid into the speech sphere—thereby eliminating hypernasality in 60 percent of cases [R. B. Yules, J. E. Josephson, and R. A. Chase].

Such exciting speech results lead one to speculate on what effect postoperative motor training might have on postoperative results. More importantly, they add impetus to the attempts to define those variables which allow selection of those hypernasal patients who do not need surgery but who can benefit from speech therapy.

### *Laub*

To emphasize the importance of speech therapy, Donald Laub of Stanford University wrote in 1976:

I have trained 2 people, one from Mexicali, Mexico, and one from San Pedro Sula, Honduras—both only Spanish-speaking schoolteachers—at Stanford—via totally bilingual interpreters who made tapes of the texts and the lectures and returned them to their country to follow and teach our postoperative palate patients. This has led me to the conclusion that speech therapy should be carried out on *almost all patients*, not just ones with “insufficient anatomy.” Speech therapy, I am convinced, should have a greater role in palate habilitation and this is my present “kick” in cleft palate.

## KNOW THYSELF

Richard Jobe of Stanford was presented with an 11-year-old boy who had had his secondary palate cleft closed by his general practitioner at the same time he did a tonsillectomy. As the child had wide open rhinolalia, Jobe used a superiorly based pharyngeal flap. He recalled:

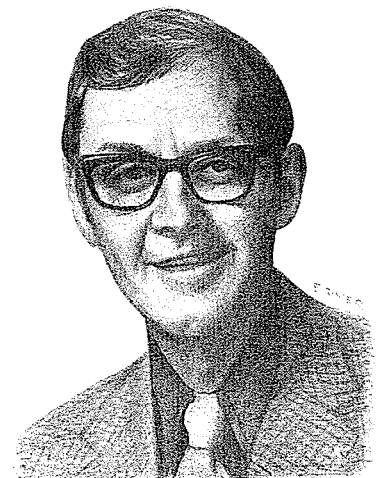
The patient had an uneventful postoperative course, though since there was a slight difference in opinion in his family as to whether or not the surgery should be done, he acted out every minor agony of the surgery to the great detriment of his mother, who was in favor of the surgery, and for the pleasure of his father, who was not. The family was immediately annoyed, of course, postoperatively because the child did not have a miraculous recovery of speech to normal. I lost contact with the patient.

About two years later at a cleft palate clinic in San Jose, a speech teacher brought in the same youngster. She reported having met this child in the school speech therapy situation and had introduced him by means of tape recorder to the fact that his speech sounded abnormal. Apparently for the first time, he understood how his speech sounded to the outside world and he began, with her help, to work on making it sound right on the tape recorder. Within a couple of weeks he was able to eliminate completely the hypernasality from his speech and significantly improve his communication. Within a month of this time, the youngster would not replicate his rhinolalia for the benefit of anyone because he had learned by now to speak normally.

I cannot say with certainty that my surgery was at all necessary or beneficial to this child. Had he understood his own speech defect, he might very well have made the same conversion without the surgery. One of the most difficult chores we have is to train people who have learned to speak abnormally to understand that what sounds normal to them inside their head would sound abnormal even to them outside their head. For this reason, I insist the speech therapists use tape recorders to help in this aspect of communication."

## THE IMPACT OF LEARNING

In 1977 Hughlett Morris, speech pathologist at the University of Iowa, former president of the American Cleft Palate Association and editor of the *Cleft Palate Journal*, noted:



*Hughlett Morris*

Quite probably the most important contribution to the cleft palate story to be made by the speech pathologist is the crucial message that speech production patterns are influenced highly by learning factors.

In our great interest and concern to address the matter of restoring to normal—or near normal—the oral structures, we all sometimes forget that the patient *learns* to talk, and that *how* he learns to use the oral structures is at least as important (if not more so!) as the structures themselves.

An interesting example of this is the use of the so-called glottal stop, heard frequently in the speech of cleft palate patients and most clearly demonstrated in what most of us recognize as the Cockney dialect. Essentially, the glottal stop is a stop plosive consonant for which the stop phase (and build-up of air pressure) is at the level of the vocal folds, as opposed to the tongue and the alveolar ridge (the *t*), or between the lips (the *p*), and so forth.

We can't really know *why* a cleft palate speaker uses the glottal stop. However, we speculate that apparently he adopts that consonant as a substitution for the other stop plosives because, to his ear, the glottal stop sounds more like a normal *k* (or *t*, or *p*) than does a *k* with accompanying nasal escape of air pressure. And so in early childhood before surgery (or dental prosthesis) has been successful in providing velopharyngeal competence, many cleft palate children use the glottal stop in their speech as a substitution for other stop plosives (most likely, the *k* and *g*).

And, because that substitution has been learned, just as are other aspects of his speech and language, he may very well continue to use the glottal stop, even after velopharyngeal competence is obtained by physical management and there is no longer any "need" to do so!

Taken alone, then, the presence of glottal stops in a patient's speech is not a useful observation for diagnosis of velopharyngeal competence, because we don't know whether the glottal stops reflect a present physiologic deficit or the patient had such a deficit in the past and is still behaving as if he still has it!

When we begin treatment for such a patient, we first must determine whether the velopharyngeal mechanism is competent. If it is not, referral for consideration of further surgery is needed; if it is, speech therapy is indicated.

Jack F. Bensen joined the Speech Department of the University of Miami in 1955, the same time I came to Miami, and we have worked together ever since. He is an excellent clinical speech therapist and here are some of his thoughts:

Speech is a learned process, learned by imitation starting shortly after birth. The child imitates the sounds he hears and the usual end result is a speech



Jack Bensen



patterning similar to that used by his parents and his peers, but unique to him.

The speech pattern of the individual with a cleft palate is the result of his attempting to produce the language patterns of his environment with an inadequate mechanism. Attempts to imitate the sound patterning around him, but with less success, result in the development of compensatory adjustments, or when these are inadequate, either acceptance of distorted sound patterning or some withdrawal from speaking or any combination of the three.

Once the cleft palate child finds some method of reproducing a sound which resembles the sound being imitated, he will continue to utilize this manner of production of that particular sound and begin the establishment of a habit pattern. When compensatory adjustments become habitual, they resist change and the longer they are utilized, the more ingrained they become, increasing the difficulty of eradication.

Speech therapy requires utmost cooperation, dependent upon the intellectual maturity, attitude and motivational drive of the child and the skill of the therapist. There are four areas of concern for the speech therapist.

#### 1. *Palatal Functioning*

If the individual has nasal emission of air during the production of all plosive and fricative sounds we have a problem. Assuming that there is adequate length and the potential for closure, it is necessary to somehow activate the function. I have found two methods effective for doing this; the more desirable is direct muscle training using a mirror. This is a very simple procedure—simply have the patient imitate your palatal action while saying “ah,” reward as motion increases. When it appears that closure is obtained consistently have the patient prolong “ah” and then say “p.” If “ahp” comes out without nasal emission you are on your way. “p” is the consonant of choice because there is no tongue movement which might interfere. From “ahp” go to “ahpah” and then to the other plosive sounds. Closure for the fricatives is best obtained by starting with a plosive and transferring to the fricative, i.e., “pf” “bv” “ts” “dz” etc. The secret here is to have the patient allow a minimum amount of air to escape on the fricative element of these sounds at first, maintaining as much intra-oral pressure as possible, and gradually increase the air flow.

If the above method fails, try direct stimulation. This is done by using your finger or a tongue blade and exciting the palatal muscles by stimulation. As motion increases, have the patient feel and observe what is happening and carry on as with the mirror training.

Blowing exercises are better for young whales and dolphins.

## 2. *Production of Consonants*

Always begin working on the specific sound which is easiest for you to get the patient to produce. If you have a choice of two or more, start with the one that most distorts the speech. If you can get adequate production of a distorted, substituted or omitted sound by imitation, you are in clover and can go on from there. The next lucky way is to give simple directions such as "Shut your teeth and blow" for "s" or "Put your tongue behind your upper teeth and blow but don't let the air out" to get the implosion for "t," then have him drop the tongue suddenly over and over again, increasing the speed. When you have a child who consistently uses a glottal catch for the plosives, start with "p," then "b," then "t," then "d," and finally, "k" and "g," unless he can easily get one of the sounds out of this order. The "k" and "g" are the most insidious and sometimes seem to take forever. Don't despair. With a considerable amount of ear training and manipulation it will eventually come.

## 3. *Facial Grimaces*

The amount and speed of movement of the muscles used for nares constriction by individuals with cleft palates is truly remarkable. In their attempts to produce some semblance of normal sounding consonants, they develop an amazing ability to shut off the nasal passageway, unfortunately at the cost of facial contortions. It is wise to attack this problem as you are working on specific sound production. Don't make the mistake of trying to eliminate these grimaces all at once. Take one step at a time and use the mirror constantly, offering more encouragement the younger the person.

## 4. *Voice Quality*

This is the most difficult aspect to treat, as it is the most persistent of all the anomalies of cleft palate speech. Excessive nasal resonance is universal in the cleft palate population and, even after successful surgery, continues in almost all cases. Why? In the first place, we build up an aural image of self and resist any change; secondly, we have built up, through perceptive cues and kinesthetic awareness, a habitual muscle patterning subconsciously, which becomes automatic. Any change must start with an awareness of need and desire for change, and right here is where the trouble begins, because change in voice quality will make the patient sound different. Besides resisting this change, most young children lack the ability to make the finite adjustments of the mechanism required. Fortunately, this can be handled somewhat obliquely. With young children, don't attempt to work on voice quality directly. Be a bit more subtle. During drill on the faulty consonants have him open up wide but relaxed to incorporate a vowel sound. At the same time adjust the volume. When all the rest of your therapy is accomplished and this excessive nasal resonance persists, you can begin to attack

the problem head on. Now this really becomes an art. Through imitation, suggestion (open up a bit more, make your lips round, feel the sound by your teeth, hit your hand with the sound), you must shape and manipulate and, when you get a sound that is "good," pounce on it and have him repeat and repeat, feeling and hearing what he is producing. Remember, what you are doing is training him to listen and feel perception and sensation, and this takes time.

Speech is habit and every day that an individual practices speaking with an inadequately functioning palate, he increases the development of compensatory adjustments and makes them more difficult to eradicate, justifying the speech pathologist's plea:

Surgeon,  
Surgeon,  
Give him a palate true  
One that functions  
As it's supposed to do.

We don't want a very short one,  
An immovable, tight or cleft one,  
But one set back  
In its right track  
And we'd like it before he's two.

At the 1978 Florida Cleft Palate Association meeting, Miami speech pathologists Jan Riley and Garnet Sinko made some practical observations:

Foibles and follies of speech therapy can be attributed to three basic sources:

1. A poorly qualified speech pathologist. Minimal requirements for a speech pathologist include an earned master's degree with a major in speech pathology, and attainment of a Certificate of Clinical Competence awarded by the American Speech and Hearing Association.
2. Timing of referral is important in two respects: (a) If the child is referred in the first 12-18 months of life, over the years a qualified speech pathologist can inform the parents of the normal process of language development, refer for necessary surgical and dental services, and prevent establishment of poor speech habits by assisting with suggestions for speech and language stimulation. (b) Speech therapy at any time is limited by the amount of velopharyngeal incompetence; in the presence of complete lack of V-P closure, it is sheer folly to expect nasal emission and hypernasality to disappear or to expect the acoustic end product of articulation and resonance to be adequate. However, glottal stops and pharyngeal fricatives can be eliminated and correct tongue placement for consonants developed, thus reducing the amount of time subsequently required in therapy following surgery. It is folly to tell the child with velopharyngeal incompetence "try

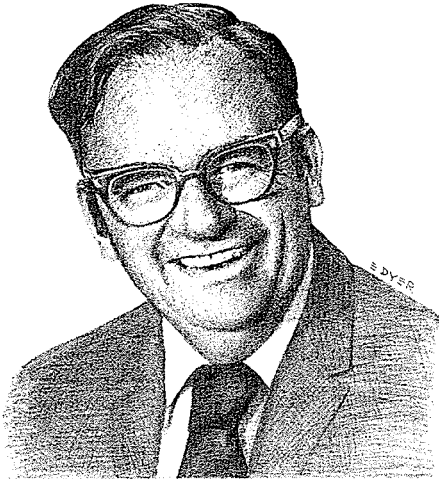
harder” or “listen,” because the more physical effort the child expends, the more nasal emission will be produced. Without adequate closure the child cannot make *p, b, t, d, k, q, s, z, sh, ch,* or *j* sounds correctly, unless his nose is pinched closed. Listening for accurate production will only frustrate him and contribute to a poor self-image. It is further folly to expect a child with marginal closure, just because he can produce sounds correctly in isolated words or short phrases, to talk normally in conversational speech. In fact, this inability should be cause for referral to evaluate the need for additional surgery. The final folly is to believe that if a child has achieved velopharyngeal competence as a result of surgery, all deviant, habituated learning will have been immediately eradicated. The therapeutic process can sometimes be lengthy and is always dependent on the third source of foibles.

3. These are the environment in which the child resides and the problems of mental retardation, psychological disturbance and hearing loss, all of which compound and frequently transcend the problems associated with speaking with a cleft palate.

The most imaginative cleft lip and palate habilitation program including speech therapy has been instituted by Edward H. Kopf in Las Vegas, Nevada. To see his therapy clinic in action, which I did in 1972, is both touching and thrilling, but as it is his conception, he should tell you about it:

#### *The Office Dummy*

Ventriloquism is fun for everyone. We have used the technique with cleft palate children for seven years now as an adjunct to traditional speech therapy. Our office has been converted to the “fun office” for these children



*Edward Kopf*



who require repeated surgical procedures rather than a place of terror. The doctor's smock and the nurses' uniforms have become symbols of love and pleasure rather than fear and pain.

It has been our feeling that if a ventriloquist can communicate through a puppet with its extremely limited mouth action, no facial expression and no hands to move that person unconsciously has developed fabulous communication techniques which he can transfer to himself.

Children who have had cleft palate surgery, with or without speech problems, as well as other children with communication problems are referred to the free ventriloquism clinic in our office open for two hours every Saturday morning. Children can come if they or the family feel the need, stop when they are satisfied and return as needed when rejection or other problems occur in their lives, for love, acceptance, and learning new routines with their puppets.



The children range in age from 18 months to 15 years. They are taught ventriloquism techniques, breath control, the regular alphabet and ventriloquism substitutes, facial expressions, delivery, jokes and simple routines which are appropriate for birthday and all major holiday parties. We try to give them a skill that other children do not have so that they are the first to be invited to parties rather than the last.

*Great!*

The parents, especially mothers, are involved in making and repairing the puppets, writing skits, hunting jokes, home rehearsal and weekly transportation. The fathers, other siblings and grandparents make enthusiastic audiences at more formal holiday presentations. On major holidays, professional ventriloquists from the Las Vegas Strip come, listen, applaud, encourage, advise and perform one of their routines as a reward.



The children in our program learn to communicate in an exciting fun situation. They learn the alphabet early as a "head start" giving them confidence when they enter the strange world of school. They develop poise and confidence while speaking and performing before their peers, adults and strangers. They no longer fear a large crowd. They develop a sense of humor. Laughter is accepted as an expression of love rather than criticism.

When he stands up to perform with his puppet he has a dependable friend with him and he does not feel alone. The dependable friend stays with him for life. It is his puppet who has all the problems. In the beginning, it is the puppet who cannot speak well until speech becomes more polished. The excuses for the puppet's failures are marvelous. The puppet is an animal and animals don't speak well; or he is old and has no teeth; or it is a baby.



When a new "cleft palate baby" is born, the parents are invited to the ventriloquism clinic so that they can see for themselves that these children are beautiful, lovable, have normal intelligence, are clever and have pleasant personalities. They see children in all ages and all stages of repair and development. They know they have been told the truth and there are no surprises. They talk to other parents freely and can intelligently discard ridiculous folklore and old wives' tales.

Plastic surgeons do not need to learn ventriloquism to add the dimension to their offices, since there are many talented professionals and amateurs whose puppets are gathering dust in some drawer just waiting for a chance to help make a better world.

With this technique we see the development of confidence in the child, pride in the parents and love in our staff.

