SPEECH THERAPY FOR CERTAIN VOCAL DISORDERS

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SPEECH therapy has been defined as the treatment of defects and disorders of the voice and speech. The affections of the voice which the speech therapist is called upon to treat are many and varied and they are in the majority of cases of particular interest to the laryngologist. Disorders of speech, such as stammering, are not the same immediate concern of that branch of medicine.

Changes in the voice may be divided into three main classes :

(i) Aphonias and dysphonias which are due to organic changes in the larynx, or to functional changes in the action of the vocal cords.

(ii) Vocal defects which are due to changes in the accessory vocal organs—the palate, nasal passages and sinuses, tongue, lips, jaws and teeth.

(iii) Alteration of the voice due to complete or very severe loss of hearing and therefore lack of appreciation of the sound of the spoken voice.

Of the organic aphonias and dysphonias some are due to diseased conditions in the larynx—paralytic, inflammatory or neoplastic—and these are rarely suitable for treatment by speech therapy, but require the application of medical or surgical measures. Others are the sequelae of such operative procedures as laryngectomy, laryngofissure, laryngostomy and tracheotomy, when the voice is wholly or partially lost.

It is proposed, in the present paper, to discuss three groups of these disorders, which are in the main referred by the laryngologist to the speech clinic and it may be of benefit to the former to know of the procedures undertaken by the speech therapist for the re-creation of the voice.

The three groups under discussion are :

(*a*) Aphonia and dysphonia of organic post-operative origin.

(*b*) Aphonia and dysphonia of functional origin.

(*c*) Voice defects resulting from severe deafness.

These present problems of great interest to the speech therapist and necessitate widely divergent methods of treatment.

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Post-operative Aphonias and Dysphonias

In operations on the larynx some part or the whole of the voice-producing mechanism may be removed. The reparative powers of the larynx are considerable, but except after the slightest manipulation there is such loss of tissue that an entirely new voice-producing technique has to be evolved. This may be achieved by procuring the overaction of the vocal cord of the healthy side, or by bringing into action the ventricular band of one or both sides or what remains of the band.

Though the muscles of the larynx are voluntary and under the control of the will as a whole, the production of voice is so complicated a manœuvre and so automatic in its detailed exercise that the individual is largely unaware of how the voice is produced or varied. To learn, therefore, to substitute these almost involuntary activities by others, demanding the conscious use of muscles whose existence was previously unsuspected, requires a high degree of patience and close application by both the pupil and the speech therapist, and it also necessitates considerable ingenuity on the part of the latter to devise exercises whereby this can be brought about.

Laryngofissure, in most cases, entails the complete removal of one vocal cord, of the entire free margin of the ventricular band and a variable amount of the soft tissues to the buccal side of this area. The recreation of the voice after such an operation depends upon the formation of a fibrous band or bar in place of the lost tissues, with which the cord of the healthy side is able to make contact. The more this band resembles the normal vocal cord the better, and care should be taken to make the superior and inferior margins of the area of excision as straight and as sharp as possible and in a plane parallel to the axis of the vocal cord.

When the patient comes for voice treatment after this operation, the therapist should begin work on a tiny cough, avoiding the use of false cords, because the tension will be too great and may cause pharyngitis. The hand-pressing method is very useful in the early stages of treatment of these cases, as well as in certain cases of voice weakness. The patient is told to close the hands and to press the backs of the fingers together with the hands held horizontally in front of the body, level with the chest and a little distance away from it. The therapist gently tries to draw the hands apart and the patient must resist. This creates the requisite amount of tension to

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cause the true vocal cords to work. If, however, the pressure and the tension are too great the false cords will be used instead. The therapist, therefore, must be careful to use just enough force to let the patient feel a little resistance.

The following case history describes briefly the treatment of a case of aphonia in the speech therapy clinic at Westminster Hospital.

M.T., female, aged 23, was referred to the clinic in August 1940 because of complete aphonia. Eleven years previously she had fractured her thyroid cartilage, and was forced to wear a tracheal canula for some months. After its removal she continued to breathe satisfactorily but with a hoarse voice until the autumn of 1939 when she contracted pneumonia and developed laryngeal dyspnœa, which persisted. The vocal cords were seen to be united by a thick fibrous web, leaving only a small triangular aperture at the posterior end. Laryngofissure was performed, the fibrous tissue dissected out and a Thiersch skin graft applied on a moulded stent, which was retained for some two months. When this was removed and the thyrotomy wound closed the patient was able to breathe and swallow satisfactorily but was unable to phonate. Her vocal cords were normal in shape but reddened and somewhat roughened on the surface, and she was unable to bring them into a position of adduction.

At her first visit to the speech clinic she managed to produce a little hoarse tone as the result of the hand-pressure treatment described above and she was told to practise it with discretion at home. At her third visit she was able to phonate without the help of the hand pressure, but the tone she produced was hoarse and of a low pitch. Next she was taught the principles of correct voice production, and during the next month she was aiming to increase the resonance and to vary the pitch of her voice. By November there was a definite increase of volume and range. On the higher notes her voice was quite clear and she was working to bring the quality of these higher tones over into the middle register. This proved to be difficult, but by the middle of January her voice was becoming smooth over a wide range. Five months later the inflection and volume were quite normal, and though there was still some huskiness, the result on the whole was considered satisfactory.

In cases in which complete laryngectomy has been performed normal voice is never recoverable and the speech therapist is faced with two alternatives : (i) to teach the patient to produce the voice by artificial means, or (ii) to teach him to use œsophageal speech, an entirely new form of voice production. If the artificial method is adopted the patient is fitted with

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an instrument which will, to some extent, take the place of his larynx. This artificial larynx consists of a small metal cylinder or sound box containing a reed, which takes the place of the vocal cords. A tube leads from the tracheotomy canula to the sound box and the reed is set in vibration by the expired air from the patient's trachea. A rubber tube leads from the sound box to the mouth and is held just inside the lips so that the sound is carried to the interior of the mouth. The sound generated by the reed is converted into speech by the action of the lips, teeth and tongue.

In order to obtain the most satisfactory results from a laryngectomy reed the patient should be taught how to use it by a speech therapist. Difficulty is often experienced in regulating the breathing during speech. If the patient exhales too quickly, the sounds he emits will resemble those of an electric motor horn, and if he has not a naturally nimble and well-controlled tongue his words will be unintelligible. Nearly all patients find that the flexible rubber tube in the mouth interferes with articulation.

Instruction in the use of the laryngectomy reed is given in the following way.

Breathing. The patient is given some simple breathing exercises to help him to control the expiration of his breath. At first the exercises are done without the reed. He is told to take an easy breath (not a deep breath) and to breathe out as slowly and steadily as possible. When he has learnt to do this satisfactorily the reed is used and he repeats the exercise. He can now feel the vibrations of the reed in his mouth and can regulate his breathing till a satisfactory volume of tone is obtained. Lip and tongue exercises for mobility and control are given next. The patient must learn to move his lips quickly and easily and to articulate the labials when the rubber tube has been inserted. Tongue exercises usually require much practice before clear articulation with the reed has been achieved.

Articulation. When the patient has acquired satisfactory mobility of the lips and when he can move his tongue quickly and neatly he is taught the correct lip and tongue positions for the vowels and consonants. He must practise these without the reed at first and study the movements of his lips and tongue in a mirror. Next he must practise without the mirror, while holding in his mouth a piece of rubber tube

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exactly corresponding to the mouthpiece of the reed. He is then given the reed itself to use and begins by making all the vowels and consonants separately, finally combining them. Easy single syllable words come next and then short phrases. At this stage he must learn to speak the phrases smoothly and not to articulate each word in separate staccato jerks.

An intelligent and painstaking patient can learn to use the reed satisfactorily in a few weeks. His articulation will be quite intelligible and the tone not unpleasant, though it will be impossible for him to imitate the many modulations of the natural voice.

The laryngectomy reed has the advantages of being comparatively easy to use, but nevertheless it is an artificial aid, and if the patient is not too old and is sufficiently intelligent it is preferable to teach an entirely new form of voice production which can be carried out independently of any mechanical aid. This is the method known as œsophageal voice production; it is not easy to acquire and sometimes causes considerable embarrassment and distress to a sensitive patient, so the therapist must be careful of the manner of approach in the earlier stages of practice should she decide to embark on this form of treatment.

Method of instruction. The patient is told to close the mouth, which is first filled with air and to contract the supra- and infra-thyroid muscles, thereby fixing, drawing forwards and opening the upper sphincter of the œsophagus, to which these muscles have become attached. Air passes into the upper part of the œsaphagus, can be retained for a short time, and let out at will with the mouth slightly open. Sound is produced by varying the tension of the sphincter and is modified into speech in the usual manner by the accessory organs of articulation.

The patient usually experiences great difficulty in getting enough air into the œsophagus and only succeeds in doing so after much practice. He should, however, be warned to practise frequently, but for short periods only, as any air which he fails to use to modify into sound will pass into the stomach and give him considerable discomfort.

When the patient can produce some sound, however little, in this way, he is immediately taught to modify it into vowels. He is taught the lip and tongue positions for these and then told to produce the sound as before but with the lips and tongue forming each vowel separately. Next he learns to combine

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two or more vowels and then adds consonants. Single syllable words come next and then short easy phrases. If the patient shows signs of embarrassment at the sounds he produces in the early stages he should be allowed to try to modify them into single syllable words at once and leave the practising of vowel sounds till later. With practice the patient can learn to speak quite fluently and though the voice is low pitched, rough and somewhat monotonous it is not repulsive.

Functional Aphonia and Dysphonia

The term functional when applied to aphonia and dysphonia, which are not of a purely organic nature, is often to some extent inaccurate. Clinically, the speech therapist is frequently faced with cases of voice disorders which appear to be of a wholly hysterical nature, and yet finds, when investigating the case history, that there has been some local organic trouble at the time of or previous to the onset of the voice defect. In a case at the speech clinic at Westminster Hospital, aphonia recurred two years after the patient had been successfully treated for tuberculosis of the larynx. Also there is often some slight organic trouble concurrent with the aphonia but insufficient to account for it.

The classical example of aphonia is that in which, on attempts at phonation, the cords are widely opened and held in full abduction, the patient being completely voiceless. The functional nature of this condition is shown by the possibility of producing a noisy cough or even laughter. This advanced type of aphonia can be overcome by many methods in use by the laryngologist—by persuading the patient, by sheer force of will, to phonate whilst holding the laryngeal mirror in position, by applying a cotton wool tipped probe to the cords, by galvanic stimulation and by various other methods. These methods are usually successful but there is a great tendency for a relapse, unless the underlying psychological cause is also treated.

The less dramatic types of functional aphonia are those in which an incomplete degree of adduction is achieved, where tension of the cords is poor, where a spasmodic closure of the glottis occurs on attempts to phonate, or where the ventricular bands are brought into contact as well or perhaps instead of the vocal cords. In this incomplete adduction of the vocal cords the muscle usually at fault is the arytenoideus

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transversus. The tone of the cords is good and full adductor rotation of the arytenoid cartilages is produced by the lateral crico-arytenoid muscles but the arytenoids are not drawn together. Less often it is lack of tension in the internal tensors of the cords which is responsible for the dysphonia and a spindle-shaped aperture remains on attempted phonation.

These types of dysphonia—not aphonia as some voice, though of poor quality, is produced—are not as a rule amenable to the methods employed by the laryngologist and present a more difficult problem for the speech therapist.

The condition is more common in women than in men and usually comes on suddenly after some shock or severe emotional disturbance. The patient finds that (*a*) the voice has completely gone, (*b*) it comes intermittently with short periods of complete aphonia, or (*c*) it is present in very poor quality and produced with considerable effort. There is often a feeling of constriction in the region of the larynx during attempts to phonate, but the patient can cough quite normally.

As a rule the patient is very willing to give the history of the onset in detail, and to describe all her symptoms minutely. This will be an aid to the speech therapist in deciding whether the condition is (*a*) a means of escape, (*b*) due to fear, or (*c*) an attempt to get into the limelight or a mixture of these emotional conditions, which it will be understood are always subconscious. The following are typical examples of these conditions :

(*a*) *Means of escape.* A singer was starting rehearsals for an important role in opera shortly after sustaining a severe emotional shock which left her in a very depressed state and unwilling to face even ordinary social contacts, much less a professional public appearance. At the first rehearsal her voice " went " quite suddenly.

(*b*) *Fear.* A case already mentioned, in which aphonia came on two years after successful treatment for a tuberculous laryngitis. The patient admitted that during those two years she had lived in constant dread of a return of the tuberculosis, and one day when she was overtired and " run down " her voice disappeared and she was convinced that her worst fears were realized.

(*c*) *To get into the limelight.* A middle-aged woman of a particularly hysterical type, who had treated her husband to " heart attacks " till he became bored with them and began to show interest in another woman, suddenly lost her voice whilst

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screaming in one of her nerve storms and succeeded for a time in attracting his attention to her new disorder.

It will be realized that owing to the emotional origin of these voice disturbances, treatment for the vocal symptoms alone will not suffice. Indeed a case cannot be said to have been cured until its emotional origin has been recognized—and accepted by the patient. At the same time the therapist should remember that the symptoms are very real to the patient and their emotional origin quite unsuspected, so that it is advisable to begin with the voice first, thus satisfying an immediate need and establishing confidence, and then proceed to approach the background, which may be of an obvious nature needing sympathetic commonsense discussion or of a deeper character only to be treated by a psychotherapist.

The treatment of functional aphonia may be either with or without mechanical aid. Where mechanical aid, such as the MacLeod-Johnson stimulator, is employed it must be remembered that the stimulation, though assisting the production of voice, has its chief value in such cases as a vehicle of suggestion.

In treatment without mechanical aid the first objective is to detract the patient's attention away from the throat. Usually much attention has been focused upon the larynx by the necessary medical examination undergone by the patient before she comes to the speech clinic. Very often, in spite of the assurance of the doctor, she still has a lurking suspicion that there is something organically wrong with her throat. It is, therefore, most important to convince the patient that any organic trouble that there might have been has been cleared up without trace and that her present difficulty is due to the fact that she has been using her voice in the wrong way ; a short and simple description of the breathing and vocal mechanism follows, stressing easy phonation and full resonation. The patient is now asked to direct a stream of breath (not voice) into the nasal passages and, to assist concentration, should place the fingers of both hands lightly on either side of the nose. The therapist works with her, gradually introducing a faint hum and then asks the patient to feel the vibration on her (the therapist's) face, at the nose, cheek-bones, and lips. The patient now tries it for herself, concentrating her attention not on making a sound but on feeling vibration on her own face. Once a hum has been produced the patient is told not to force it, but to allow it to grow, feeling the vibrations more

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and more strongly. Then she opens on to all the vowel sounds, followed by the combined consonant and vowel sounds and finally to short and to longer phrases.

When the voice has been restored, the patient should be assured that she has now become mistress of her voice and there is no need for her ever to lose it again. Such cases are not easy, and success depends upon the suggestibility and mentality of the patient, her environment, and on the approach and handling of the speech therapist.

The MacLeod-Johnson stimulator is so made that the electric current which produces the stimulation, applied externally to the patient's larynx, at the same time produces sound, the pitch of which can be regulated and graduated from low to high. By this means the patient receives both laryngeal and auditory stimulation, while the therapist, by means of a pair of headphones, can lead the patient, with regard to a given note, usually produced first as a hum. From the hum the patient is told to open on to " ah " and thence to other vowel sounds, then to count, etc. Many cases have been treated by these means, but its most obvious disadvantage lies in the fact that it is a mechanical aid entirely outside the control of the patient's individual will, and many patients are subconsciously inclined to endow it with magical properties and to feel that if the voice goes again the instrument will restore it. For this reason the speech therapist should regard the stimulation as a secondary aid, to be used only when other methods have failed.

The following case histories are of two patients who were treated without mechanical aids in the speech clinic of Westminster Hospital.

U.L., female, age 26. Functional dysphonia.

The voice was very gruff and hoarse and frequently " faded out " entirely. Onset occurred three months before treatment, and there was nothing that she knew to account for it. She was a young woman of commanding appearance and an abrupt and domineering manner which covered considerable shyness and lack of confidence. At work she was in charge of several girls and often had to speak to them out of doors. After a good deal of persuasion she admitted that she went in some fear of losing her authority over the girls by letting them discover her fundamental shyness. " I know my job all right," she said, " but my personal relationship with the girls worries me and so I shout at them to show that I'm not afraid and don't care what they think of me. But all the time I really want them to like me."

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The patient reacted very quickly to the voice treatment outlined above, although she had previously received treatment by faradic stimulation without results. After three visits her voice had improved very much, but it was not until she had acknowledged and accepted the fact that her vocal difficulty was due to her fear of " making a fool of herself " and that she had used it as a means of escape from her duties that her voice became entirely normal.

A.G., female, age 45. Functional aphonia.

A.G. had suffered from tuberculosis of the larynx some years before the aphonia for which she was admitted to the speech clinic. The old trouble had quite healed and she had been able to speak quite normally for a number of years. The aphonia was complete and the laryngologist's report stated, " No lack of mobility in cords, but absence of co-ordination in attempt to phonate."

Faradic current on the throat had been tried without success. She was in a very depressed condition, rather unintelligent, and very emotional and at first refused to co-operate in any way.

The onset was said to have taken place quite suddenly four months previously, " while having an argument on a bus with another lady ". When after considerable persuasion she produced a hum she was so horrified that she burst into tears. It was not until she had been admitted as an in-patient and was receiving medical and dental treatment as well as voice treatment that her voice became normal. Though subsequent reports are satisfactory it is questionable if this result will be maintained, because she refused to discuss the psychological aspect of her difficulty and to the last was convinced that a miracle had been performed upon her, and even succeeded in publishing the fact in the popular press.

Voice Defects Resulting from Severe Deafness

A normal child learns to speak by hearing and imitating the speech of those around it. Deaf-mutism is a condition in which speech is absent owing to a high degree of deafness. The deafness may be congenital or acquired at a very early age.

It is vitally important that the case of the hard-of-hearing child should be correctly diagnosed while the child is still young enough to learn easily, and before speech and hearing have had time to deteriorate through lack of use. In such a case the child who had acquired partial deafness will at first strain to hear speech, but eventually he will give up the unequal struggle and the residue of hearing will decrease from disuse, while what he hears imperfectly he will repeat imperfectly, and so the faulty articulation and the flat toneless voice of the deaf are produced.

Cases of congenital deaf-mutism do not come within the

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scope of the speech therapist. Such patients should be admitted to a school for the deaf, where they will have the advantage of being educated as well as taught to speak and to lip-read by highly skilled teachers who are trained and qualified in the work. If, however, severe deafness has been acquired some years after speech has been established, the speech-therapist can do much to prevent the deterioration of the voice.

Method of instruction. The patient is told to concentrate on trying to recall the sound of some familiar voice and to describe it—whether it is high or low, whether loud or quiet, or if it is monotonous. She is advised to practise recalling many familiar voices in this way. Next she learns to distinguish difference of pitch by placing her finger-tips lightly on her throat in the region of the larynx, and after mentally recalling tones of different pitch to produce them and compare the movements of the larynx. She learns to control the volume of her voice in the same way. Later she must learn to control the pitch and volume and to use inflection without the help of her fingers, relying only on her memory of voice and on the sensations experienced in her larynx and her resonance cavities—her mouth, nasal passages and sinuses—during phonation.

This work requires great concentration, and care should be taken not to tire the patient and to give plenty of encouragement, for deaf people usually have little self-confidence and are easily discouraged.

The three types of vocal disorders which have been selected for survey are frequently to be met in the speech clinic of any general hospital. Speech therapy, however, has a wide range and there is no lack of variety in the work. The therapist is called on to treat defects of articulation, ranging from comparatively simple lisping and lalling to those which are symptomatic of neurological disorders. Many speech disorders are closely allied to emotional disturbances, particularly in cases of stammering in both adults and children, and in such cases the treatment consists chiefly in the elimination or adjustment of those emotional factors.

It is interesting to note that there is a considerable field of voice disorders which do not fit into any scientific classification. Perhaps it would be more accurate to call them voice defects or pecularities, rather than disorders, since they do not seem to cause any particular distress. Most noticeable among these is the harsh, rasping voice of the newsvendor, the strong,

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hoarse cry of the stall-holder on any market place, and, most common of all, the voice of the cockney street urchin. Yet few of these come to hospital suffering from loss of voice. They go on happily all their lives using their voices in a way which ought to ruin any voice in a week. This vocal harshness seems to be most prominent among those who live in large cities, amid constant noise and often in overcrowded houses, so it is perhaps reasonable to suppose that nature strengthens their vocal mechanism to stand the strain imposed by environment. And the result, though unmusical, serves its purpose.

It will be seen from what has been written that the training of the speech therapist must include many subjects—phonetics, neurology and psychology as well as the theory and clinical practice of speech therapy. The specialty is a young one, and some confusion still exists between the functions of the speech therapist and those of the teacher of voice production. They are quite distinct, the former being concerned with speech and voice from the therapeutic angle and the latter from the educational or artistic side. In recent years speech clinics have been established in many hospitals in London and the provinces. Some of these are also training centres for students of speech therapy. The neurological branch of the Emergency Medical Service has asked the British Society of Speech Therapists to supply a list of speech therapists available for part-time appointments in specialized units all over the British Isles, and it is hoped that in the near future other specialized units will consider appointing speech therapists to their hospitals.

Speech therapy first began to take an organized form during the war years 1914-18, but it was not until 1935 that the British Society of Speech Therapists, now on the National Register of the Board of Medical Auxiliaries, was established. It was formed to organize the specialty by instituting a system of examination based on a suitable syllabus of training, and to set up a standard of knowledge and professional practice consistent with the responsible nature of the work. Members and associates of the society work in close collaboration with members of the medical profession and there has recently been much proof of the increasing recognition of speech therapy in medical circles.

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