REMARKS ON DYSPHONIA*

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Organs producing speech

THE speaking voice is a late evolutionary development in man, and is largely an acquired characteristic. The organ of phonation is the larynx which has been adapted for this purpose, although evolved primarily for breathing and deglutition. Air is squeezed from the lungs through the larynx and is set in vibration by the movement of the vocal cords. The noise or voice thus produced is made into intelligible speech by the pharynx, tongue, lips, palate, teeth, nasal cavities and nasal accessory sinuses. Some of these organs give the voice resonance, whilst others are concerned with articulation. Up to a point resonance is a quality inherent in the individual whilst articulation is consciously acquired, but the two qualities cannot be completely separated, as both depend upon muscular movements which alter the size of the pharyngeal and oral cavities as well as the tension of the walls. The very act of articulation thus automatically affects resonance.

Many a singer whose voice has deteriorated still gives great pleasure by using to the full his training in articulation and enunciation to support his failing voice. Technique of this quality is, however, exceptional, as the average person is not trained either to sing or speak. Professional speakers are well aware that speech is a complicated and exacting art, especially if it is to be recorded. Modern electronic reproduction accentuates every idiosyncrasy of inflection or articulation, and although this can be put to effective use, it more often results in exaggerating unpleasing qualities.

Normal acquisition of speech

The child acquires the speech of his environment by mimicry, and even late in life the tone and inflection of speech may betray regional origins, and, in England, very often also social origins.

The voice is under constant surveillance by the ear. The child hears the speech of those around him, and naturally imitates it. Even in adult life, with formed speech habits, sojourn in a place where accent is different may result in its insidious acquisition, in spite of conscious resistance. As well as hearing the speech of others, the individual hears his own, and this

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perception forms the afferent side of a reflex arc acting through some area of the cerebral cortex. In childhood an unconscious and automatic regulation of speech results, whilst in adult life the mechanism can be used to exercise a conscious control. However, the voice and speech of a person when played back by a dictating machine sound quite different to him, and self-education is therefore limited without the assiduous and critical use of recording apparatus.

In the normal random acquisition of speech there is thus ample opportunity for errors of technique, and it says much for the natural mimetic powers of childhood that so little difficulty is usually experienced in acquiring a reasonable speaking voice. Nevertheless, defective resonance, defective articulation and defective phrasing are not uncommon even in adults whose livelihoods depend upon speech.

Some types of Dysphonia

Hysteria

The means by which speech is acquired and produced leave plenty of scope for functional disorders, and it suffers more from hysteria than any of the other specialized somatic activities. Functional dysphonia, including stammering, and functional aphonia are common hysterical reactions to environment, and are often obstinately recurrent. There are also grosser functional defects like rhinolalia and puberphonia. In aphonia, the patient is reduced to a whisper, although often a fluent and voluble one, with occasional snatches of resonant voice, uneven and uncertain in pitch. It is due to incomplete adduction of the vocal cords during conscious phonation. However, activities of a more automatic kind are unhindered, and the patient can usually cough with vigour and resonance—one of the ways of recognizing the condition. When coercion fails, speech therapy may succeed, and I have a recording of such a case, which even resisted the blandishments of the psychiatrist.

Vocal strain

Many disorders of adults began in childhood, the commonest being a slightly rough and somewhat toneless voice. The racket coming from any school playground has only to be recalled to realize that children often develop the habit of shouting and screaming to each other as a normal means of communication. This vocal strain sometimes results in a raucous voice which usually disappears during adolescence, but may occasionally persist into adult life. Singing in choirs in an unnatural range may have the same effect, and sometimes occurs in adolescents when the voice is in an unstable stage of development.

Various structural changes are produced in the larynx and have been described elsewhere (Ellis, 1952). They are sometimes so gross that it is

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hard to believe they could ever disappear. However, the reparative powers of nature usually obliterate all trace of abnormality, and proportionately few of these cases retain permanent changes. As in all cases of chronic vocal difficulties, the poor quality of the voice often results in conscious efforts at improvement, and the ventricular bands are brought into play. The rounded surfaces of these bands produce a voice of most unpleasant quality—harsh, strident and devoid of tone—and the act of speaking is performed by exaggerated straining movements. These attributes are almost diagnostic of ventricular band dysphonia. If the habit has lasted any length of time, the ventricular bands enlarge by muscular hypertrophy and mucosal hyperplasia, and the condition becomes virtually irrevocable. Even in such cases speech therapy methods can help. I have a recording of a man whose voice was strained in childhood. The cords are enlarged and slightly irregular, and the ventricular bands are twice the normal size.

Puberphonia

The normal change at adolescence of a boy's to a man's voice is due to enlargement of the larynx and hence elongation of the vocal cords. The change may be abrupt, but is more often gradual, lasting a year or so, during which the voice is unstable, breaking at times into a falsetto and then returning to bass or baritone. There is usually an ultimate drop in pitch of about an octave. The transition between the two stages is occasionally arrested, and, in males, the persistence of puberphonia into adult life is obvious and usually distressing. Certain endocrine conditions may be responsible, by preventing the normal growth of the larynx, and at one time castration was practised to preserve the falsetto voice. Opera parts have been written especially for male castrati. Nowadays, however, the condition is usually due to some psychological disturbance in which homosexual tendencies may be involved. A fully developed case of this type is a problem for the psychiatrist, but the lesser forms can be helped and often cured by reassurance from a laryngologist followed by speech therapy.

The reverse condition, a male voice in a woman, is uncommon, and again may be a bye-product of homosexuality. More often it is due to faulty voice production, perhaps made worse by chronic laryngitis from excessive smoking, and in these cases the laryngologist and speech therapist can often be helpful.

Vocal cord paralysis

An organic functional dysphonia arises if one vocal cord is paralysed. There are many causes of such paralysis, but I particularly have in mind a lesion occurring in a relatively young person. In the last few years I have

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seen several cases, either due to poliomyelitis or a virus peripheral neuritis, cases which are usually lumped together under the heading of idiopathic. A few still occur after thyroidectomy. The vocal cord is usually somewhere near the midline, and the opposite cord in time approximates to it in phonation. The result may be a voice almost indistinguishable from normal, and although this may occur as a natural and spontaneous compensation, careful tuition can be helpful. I have a recording of a young woman of 25 with complete paralysis of the left vocal cord possibly due to poliomyelitis, which illustrates this.

Vocal abuse

Vocal abuse is an extreme form of vocal strain, but usually arises in adult life. There are two lesions, due to quite opposite conditions, specifically associated with bad and excessive use of the voice.

Chorditis nodosa, or vocal nodules, occur at the junction of the anterior and middle thirds of the vocal cords. High notes are produced by the anterior ends of the cords, and abnormal vigour coupled with bad technique may result either in small hæmatomas with subsequent organization to fibrous tissue, or to a hyperkeratosis resembling a corn. Sopranos trying to reach high notes outside their range or clergymen intoning in a forced manner are the usual sufferers, but female teachers screaming at recalcitrant children often develop these nodules.

At the opposite end of the scale are men who talk down in their boots, as it were. The harsh and gruff voice causes undue movement of the arytenoids, and the vocal processes are forced together in an abnormally vigorous fashion. Hyperkeratotic masses gradually develop at the tips of the vocal processes projecting medially into the lumen of the glottis. One is usually shaped like the summit of a volcano and the other is conical fitting into the crater of its fellow. Jackson maintains that the crater is an ulcer with necrotic cartilage at its base, but I do not believe this is usually the case. At any rate the condition results in the perpetuation of the harsh and unpleasant voice from which it derived.

Other hypertrophic changes occur, many of which are wholly or partly the result of vocal abuse. One such patient, working as a cleaner in a dusty environment, also a smoker, and with a family of small children to be controlled, presumably entirely by the power of the human voice, developed nodular hyperkeratotic masses on both vocal cords. The appearance is positively frightening, and I think of carcinoma every time I see it, although I have watched the larynx for nearly four years, have taken several biopsies and can see that both cords are freely mobile.

Functional singing

It is axiomatic that however much a patient may stammer in speaking, he can always sing without stammering. In fact, Mr. St. John Rumsey,

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Mr. Willmore's predecessor at Guy's Hospital, used this as the basis of his treatment of stammering. The singing voice may be abused, as is well known, but it rarely suffers from functional disorders. I have a recording of a case of normal speech and functional dysphonic singing, to coin a phrase, must be almost unique. It has so far eluded cure.

Conclusion

In many functional and organic maladies of the larynx, speech therapy is a rational method of treatment, and in some it is the only treatment. I have cited examples of standard types of case which laryngologists would normally send to a speech therapist without much hesitation. I hope I am speaking for laryngologists as a body in saying that I would like to know whether there are other, perhaps less clearly defined, types of case, which I am at present not recognizing, and which would also benefit by speech therapy. Furthermore, I would be extremely interested in hearing something about the techniques employed by speech therapists in these various disorders.

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REFERENCE

ELLIS, M. (1952) *In* Diseases of the Ear, Nose and Throat, ed. W. G. Scott-Brown, London. Vol. I, p. 609.

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