

IS HUMAN SPEECH GOOD ENOUGH?*

By SIR RICHARD PAGET, BART.

THE answer to the query in the title depends on what we mean by human speech—and what we mean by good enough!

Very few ideas can be directly expressed by sounds; sound itself is not an essential of human speech—we can speak (to ourselves) and express meaning simply by making the motions of 'articulation', without producing any sound; deaf people who have learnt the art of lip-reading can understand such silent speech, by watching the gestures of articulation. It is therefore the gestures rather than the sounds of speech which carry meaning; the functions of sound, in speech, are to enable its meaning to be identified by ear.

The gestures of articulation are fundamentally pantomimic, and this pantomime is made audible by the vibration of our vocal cords—to produce 'voiced' sounds; or by blowing air through our vocal cavities—to produce the 'unvoiced' speech sounds. The gestures of articulation modify these voiced or unvoiced sounds in much the same way as the manipulation of the keys, slides, etc., of a musical wind instrument modify its sounds; just as a skilled trombone player could, with his eyes shut, visualize the gestures of another trombone player by simply listening to his playing, so we, subconsciously, recognize a speaker's gestures of articulation by listening to his speech. The voiced and unvoiced sounds of speech are the relics of the original emotional language of mankind.

The origin of mouth pantomime may be recognized in the born deaf; they naturally express their ideas by bodily pantomime—mainly hand pantomime—which they enrich with facial expression. Some form of emotional expression is essential if we are to succeed in making our fellow men think as we want them to.

The combination of hand pantomime and emotional sounds eventually produced speech because of the Darwinian "imitation or some kind of sympathy" between the movements of man's hands and mouth (Darwin, "The Expression of the Emotions" (1872), p. 34). Alfred Russel Wallace, in an article in the *Fortnightly Review* during 1895, wrote: "Speech was formed and evolved . . . by men and women who felt the need of a mode of communication other than gesture only. Gesture-language and word-language doubtless arose together, and for a long time were used in conjunction and supplemented each other".

It follows that as primitive man pantomimed, his mouth—without his knowledge—took part in the pantomime; the result must have been a 'gabble' of speech-like sounds due to the changes of the volume and size of orifice, and the constrictions and stoppages of the vocal cavities, and to the changes of the tone of voice caused by changes of emotional state.

In general pantomime, the sequence of gestures does not represent a succession of words—it describes actions or states as a whole. This stage of general pantomime, accompanied by mouth gabble, may have been man's normal mode of expression during the greater part of his million or half-million years of prehistoric development.

According to Prebendary Albert Smith, chaplain to the Royal Association in aid of the Deaf and Dumb, the uneducated born deaf still do not think in the

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same way as hearing people. They have no signs comparable to our words; their impressions are generalized (like their pantomime) and they cannot define anything, because they have no units with which to define. This is a point of the utmost importance. It distinguishes the career of primitive man from that of *Homo sapiens*, the analytical thinker of the last six or eight thousand years. At some point in his unrecorded history, man must have hit upon a new way of mentally handling his impressions; he separated them into categories, such as shape, colour, number, etc., and symbolized each separate element by a distinctive pantomimic sign. He could then begin to play with units of thought, transposing and recombining them in his mind, so as to arrive at new combinations and inventions.

This is admittedly hypothesis; but it offers a reasonable explanation of man's sudden and rapid advance in civilization. It was not man's brain which suddenly changed, but his way of using his brain.

The discovery, by primitive man, of the new method of analytic symbolism must have led, by slow degrees, to a new type of sign language composed of separate signs equivalent to modern words, performed in a more or less logical order, such as the Red Indian sign language.

The gesture theory of speech has recently received powerful support from Prof. Alexander Jóhannesson, of Reykjavik University, Iceland, who sent me a statement of which the following is a summary: In a twelve-years study of the Icelandic language (old and new) Prof. Jóhannesson examined every Indo-European root and found the etymology of about 20,000 words. It became gradually clear that a great many roots showed a primary meaning which was in accordance with the nature of the sound. In 1943 he published (in Finnish) his book "On the Primitive Language of the Indo-European People", in which he explained about 25 per cent of the whole Indo-European material and showed that a great part was due to imitation by the speaking organs of the movement of the hands. Having written about half of his book, my "Human Speech" came into his hands; he was delighted to see that, by studying the nature of the sounds, I had come to nearly the same results as he had by comparative philology. He was encouraged by my work and was now able to explain the majority of the Indo-European roots as gesture; he was highly satisfied to find the gesture theory confirmed also in Hebrew (in certain sound-groups he easily explained 60 per cent). He believes that my gesture theory will be of great importance for philology, and regards the problem of the birth of language in its chief principles as solved. Philology will take its place among the other sciences in the evolution of man. He is convinced that an international auxiliary language—which will be much needed in the near future—can only have a prospect of success if constructed in accordance with this new knowledge.

Here I must make one disclaimer: I did not originate the gesture theory; this was, I believe, originally propounded by Mr. J. Rae, of Honolulu, in three articles written, in 1882, for the *Polynesian* newspaper. Mr. Rae's work was referred to by Prof. Max Muller at a Royal Institution lecture on the science of language in 1863. His theory was not then described, but the British Museum had a bound volume of the *Polynesian* and the articles were reprinted as an appendix to my "Human Speech".

As to the question, "Is human speech good enough?", the answer, considering the appalling

confusion into which this world has been thrown, largely by muddled thinking and perpetual misunderstandings, must surely be: No! We needed something more precise—more quantitative and less ambiguous—something which will advance human mentality as mathematics has advanced physical science and technology. The mystery and magic of human speech need no longer block the way. The late Prof. Otto Jespersen ("Mankind, Nation and Individual from the Linguistic Point of View", 1925) emphasized the duty of improving language for the sake of future generations, and said that "that language is best which, at every single point, is easiest to the greatest possible number of human beings".

English—though probably the best language yet evolved—is still very imperfect. Thus: 'to understand' does not mean 'to stand under'; 'to learn by heart' does not mean 'to learn by means of the heart'; 'to undertake' does not mean 'to take under'. As to changes of articulation in course of time, the so-called 'sound shifts' are mainly only 'exhibits' of the principle of 'least effort'. The organs of articulation tend to make their gestures easier to perform; voiced sounds become unvoiced, tongue postures are shifted to accommodate the accompanying consonant gesture, etc. Generally speaking, although 'least effort' is ever present, the significant gestures tend to be preserved, though the manner of making them may be modified.

As to verbal inflexions, English has discarded all the Germanic forms except that of the third person singular of its verbs—this hissing 'relic of barbarism' should be removed! Grammar itself is a relic of barbarism; it probably had its origin in sign language. Thus, it is easy to combine, say, the sign for 'come' with the finger signs for 1 or 2 or many, so as to sign one person come, two come, or many come. Mouth gesture cannot imitate these combined hand gestures; new arbitrary mouth gestures are substituted, and language becomes burdened with singular, dual and plural forms of its verbs.

Both English language and spelling need reform. Prof. Gilbert Murray, who is president of the Simplified Spelling Society, in a letter to me wrote: "I very much agree with you that English is so nearly a good language that it really ought to be looked after". If all children were taught something about the present imperfections of English, and were initially taught a rational system of spelling, reform would come of itself in another generation; if all children (throughout the world) were taught sign language—as a form of play—there would be one auxiliary international language available within the next twenty years. The British Commonwealth and the United States should join in appointing two English-speaking commissions, one to study the language, the other the spelling. Sufficient unification of pronunciation could easily be achieved through educational talking films and broadcasting.

The following are suggested as essential requirements: (1) Audibility. This implies that the unvoiced speech sounds should be eliminated, as being utterly inferior in audibility and in musical and emotional value. Also that accuracy of articulation should be considered as important as finger technique is in the playing of musical instruments. (2) Every word should be the result of a gesture of articulation which is pantomimically related to the meaning of the word. (3) Every word should be invariable in its form, and capable of use as any part of speech—as

in Chinese. (4) Every root word should be monosyllabic. (5) The word order should be strictly logical—it is absurd to invert the word order to denote a question (as in English). (6) Homophones should be eliminated. (7) The spelling should be systematic—with a separate alphabetical symbol for each separate sound.

The development of an international auxiliary language on these principles has been carried near to completion by Mr. Kenneth Littlewood. It is named 'Monling', and was expected to be ready for the printer shortly. The sentence "The best language is that which is easiest to learn and use" becomes, in 'Monling', "Ling 't top pai ken ad ploi il klar top bon"—where ' represents the English indefinite vowel, like the 'e' in "the king" or the 'a' in sofa.

CHEMOTHERAPY OF TUBERCULOSIS

By DR. M. A. SOLTYS
University of Cambridge

SINCE Ehrlich's discovery of 'Salvarsan' there have been several attempts to seek a chemotherapeutic drug for the treatment of many infectious diseases. Of all the chemical substances studied in the chemotherapy of tuberculosis, calcium and gold compounds have probably attracted more attention over a longer period of time than any others. Maver and Wells¹, from their intensive investigations, came to the conclusion that calcium does not support the conception of a favourable influence on the course of tuberculous infection, nor does it appreciably increase the calcium content of blood and tissue, and no specific significance has been proved as yet for calcium and its combinations.

Concerning gold therapy, Møllgaard in 1924 presented 'Sanocrysin' ($\text{Au}(\text{S}_2\text{O}_3)_2\text{Na}_2$) as a *magna sterilisans* in tuberculosis on the basis of animal experiments. He claimed that 'Sanocrysin' in the blood stream causes lysis and kills the bacilli. Afterwards that substance and several other gold compounds were studied by many workers, who claim that gold exerts no direct bactericidal action on the tubercule bacillus, but that it increases the resistance through the reticulo-endothelial cells. According to them, gold appears to have found its place as a reinforcing stimulant in the therapy of tuberculosis, especially in cases in which collapse therapy is for some reason or other impossible.

The year 1935 brought a great change in bacterial chemotherapy by the discovery of sulphur drugs. After the first reports of Rich and Follis² on the inhibitory effect of sulphanilamide in experimental tuberculosis of guinea pigs, two opposing opinions developed concerning this effect: first, that of the group of investigators who used exactly the same technique as Rich and Follis and obtained similar results, especially with sulphanilamide and sulphapyridine; secondly, that of the group of investigators who chose other routes of administration and also different sulphonamide derivatives; but the drugs tested were comparatively ineffective.

Striking results have been attained by Feldman and Hinshaw³ and their co-workers in experimental tuberculosis of guinea pigs treated with the new diamino-diphenylsulphone compound 'Promin'. 'Promin', in its solid form, varies from white to light yellow and