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Physiologie der Stimme und Sprache*

HANS LULLIES

The second part of the volume under review is devoted to the physiology of voice and speech. It has all the advantages of the first part insofar as careful editing, excellent printing and first rate illustrations are concerned. Its contents, alas, do not quite measure up to its external form. Its author, Professor Hans Lullies, is a newcomer to the field of speech and voice (his previous published work has dealt exclusively with the physiology of nerves and muscles) and he labors heavily under the disadvantages of one who is not entirely in command of this intricate subject. He is not properly acquainted with some of the most important literature, and he does not seem to know what issues are central in the field at present.

An examination of his very extensive bibliography makes this clear. It contains a great many items that are completely irrelevant to the topic under discussion or have only an antiquarian interest today. At the same time it omits some of the most fundamental modern contributions, particularly works published outside Germany. Thus, e.g., the reader will be surprised to find a reference to an article on "phonetic observations on a speaking dog" (sic!) and another to a study on the "sensory world of bats," while no mention is made of H. Fletcher's *Speech and Hearing*. The bibliography lists an investigation on "the attraction of the female *gryllus campestris* L. by means of telephonically transmitted stridulation sounds of the male," but does not have a single reference to the work of the great phoneticians of the last hundred years—Sievers, Vietor, Roussellot, Sweet, Jesperson, Jones. Brücke's *Grundzüge*, and Grützner's *Physiologie der Sprache und Stimme*, two venerable publications of the 1870's, have found their way into the bibliography, while T. Chiba's and M. Kajiyama's *The Vowel, Its Nature and Structure* (Tokyo, 1941), the definitive monograph on the subject, and most of the more recent work on the radiography of speech[1] are passed over in silence.

For reasons that are not entirely self-evident, physiologists, when dealing with speech, have almost always concentrated exclusively on the action of the larynx. Lullies follows this tradition and devotes fully two-fifths of his book to a discussion of the structure and function of the larynx. Although the author pays lip service to the fact that the speech process is more complex than that, one would look in vain for detailed information about the structure and functioning of the other organs essential in the production of speech. The structure and movements of the tongue, the geometry of the nasal cavity, the role of the teeth, of the lips; all these are treated in passing only or not mentioned at all.

And it is precisely here that a detailed physiological description would have been most valuable, for with this information we might be able to solve some of the old problems of the nature of speech sounds. By means of the various vocal tract analogs, we are today in a position to synthesize sounds: i.e., compute their power spectra from the geometrical configuration of the vocal tract. We could probably solve the problem of the acoustical nature of nasality if we had an exact description of the dimensions and shapes of the various sub-volumes that make up the nasal cavity. This information is extremely difficult to obtain, since the standard treatises on the anatomy and physiology of the nose were written by medical men or physiologists with little or no interest in the problems of speech. Lullies would have rendered a great service to our science if he had provided us with these data.

In his treatment of the acoustics of speech the author is again on ground that is thoroughly unfamiliar to him. Here too he devotes a great deal of space to secondary matters, such as the ancient controversy (resolved for all practical purposes by Rayleigh) between Helmholtz and Hermann on the nature of vowels, but does not mention significant new developments such as the various electro-acoustical analogs of the vocal tract (Dunn, Fant, and K. N. Stevens).

To the complicated question of the consonants he sees fit to devote no more than three pages. There is nothing in the book to indicate that Lullies has given thought to the information about consonants contained in *Visible Speech*, although he is familiar with this publication through Meyer Eppler's German summaries. The work of the Haskins Laboratories, which has particular relevance to certain aspects of the consonant problem, is apparently unknown to the author.

Any attempt to overcome the conventional boundaries separating diverse scientific disciplines is to be welcomed. Unfortunately, the present attempt is not at all successful, for at least in the field of speech, Professor Lullies has not achieved the degree of competence that alone can assure a satisfactory completion of this difficult task.

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[1] For a recent review of the literature see A. S. MacMillan and G. Kelemen, Arch. Otolaryngol. 55, 671–688 (1952).