

book is not, nor was it intended to be, a reactor-physics text. For the most part it is restricted to the one-speed problem. The whole question of suitable methods for treating the energy variable, which in reactor analysis is just as important as the spatial and angular variables, is ignored. For this the interested party must refer to the standard reactor-physics texts of Alvin Weinberg and Eugene Wigner, Meghreblian and Holmes, and others, or the recent book by M. M. R. Williams, *The Slowing Down and Thermalization of Neutrons*, which treats the energy variable almost exclusively.

For its fine discussion of the application of the singular-eigenfunction method to linear-transport problems, this book can be recommended without reservation. Although most of the problems solvable exactly in transport theory can be handled by other methods (Fourier transforms, Wiener-Hopf techniques) the singular-eigenfunction method is a single technique that handles most, if not all, such problems. With the critical-slab problem, it is the only known method that yields a solution. Because of its relatively wide utility and elegance, all physicists interested in transport phenomena should become familiar with this technique. This book is an excellent means to gain this familiarity, and it will be a valuable reference to have in one's personal library.

* * *

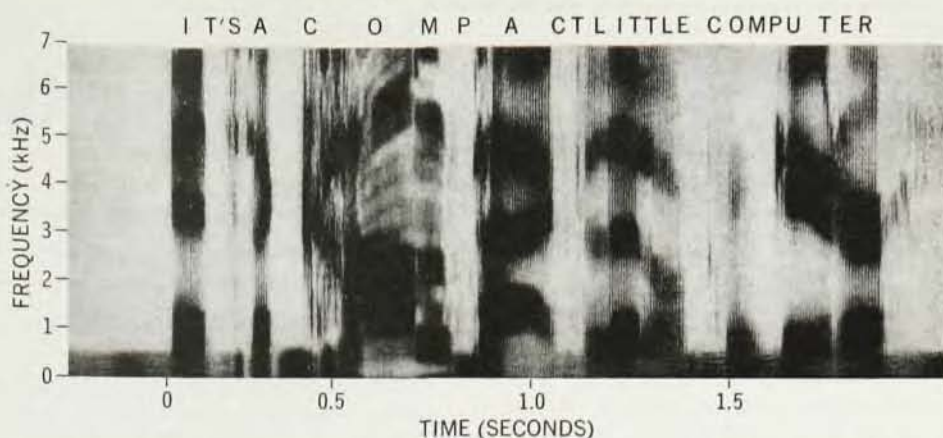
The reviewer, a physicist with Gulf General Atomic Incorporated, does work in reactor physics and transport theory.

Acoustics of speech

READINGS IN ACOUSTIC PHONETICS. (Reprint collection) Ilse Lehiste, ed. 358 pp. MIT Press, Cambridge, Mass., 1967. \$10.00

by Sanford E. Gerber

To assemble a collection of readings that is more than just an odd assortment of reprints requires that the assembler apply some unifying criterion beyond a commonality of subject matter. The outstanding unifying criterion in this volume was, "... to present articles in which an original idea was formulated for the first time." For one to determine the extent to which this criterion was satisfied would demand the same labor that Ilse Lehiste has done; I am confident that she has satisfied it. I am not confident, how-



FREQUENCY SPECTRUM as a function of time for the sounds in the sentence "It's a compact little computer" as recorded by a Bell Telephone Laboratories spectrograph.

ever, that the criterion of originality is the best one. I would wonder if some of these first articles were altered, modified or refuted by later studies, perhaps by the same authors. I would wonder, then, if the book's historical value might exceed its scientific value in some places. For example, the volume contains some papers that deal (at least in part) with the theory of distinctive features of Jakobson, Fant and Halle. This is a most important theory; but there is nothing in this book that indicates the theory is also a controversial one.

All told there are 32 papers reproduced (not reprinted) in this volume. Lehiste seems to have done a satisfactory job of meeting an additional criterion of completeness in terms of subject matter. There are seven papers on acoustic theory and speech analysis; 15 on acoustic structure; and 10 on the synthesis and perception of speech. Her other criterion, "... whether the article was difficult to obtain" did not seem to be a very rigid one. There were only five papers that I had not previously read. Her concept of difficulty was based on linguists' habits of not visiting physics or engineering libraries. I doubt that this is a good criterion, and it caused her to omit articles "of linguistic or phonetic journals." This probably led to some serious omissions. Actually, she used nine different journals and one Festschrift; but 20 of the reproduced papers appeared in the *Journal of the Acoustical Society of America*.

While one may take issue with Lehiste's choice of selection criteria, her competence to do so is not an issue. She was educated in Estonia, in Germany, and at the University of Michigan where she was associated

with the late Gordon Peterson. She is currently professor of linguistics and chairman of the division of linguistics at the Ohio State University.

I continue to find this a useful book. It contains a number of papers to which I often wish to refer, and I can now go to this one source instead of digging through my journals and files. It would also be a valuable adjunct text for a graduate-level course in phonetics or in communication science. Its text value would be greater if it were an anthology rather than just a compilation, that is, if the author had commented on each paper.

In summary, while the book is not all that I would like it to be, I like what it is. It would be a useful addition to the library of anyone active in speech research, communication science or language engineering.

* * *

The reviewer is at the Speech and Hearing Center of the University of California, at Santa Barbara.

A particle gold mine

CURRENT ALGEBRAS AND APPLICATION TO PARTICLE PHYSICS. By Stephen L. Adler, Roger F. Dashen. 394 pp. W. A. Benjamin, New York, 1968. Cloth \$12.50, paper \$5.95

CURRENT ALGEBRAS AND THEIR APPLICATIONS. By Bruno Renner. 177 pp. Pergamon Press, Oxford, 1968. \$9.00

by Jeremy Bernstein

As early as 1960 Murray Gell-Mann realized that the currents through which leptons interact weakly with each other commute, as he then put it, like "angular momenta." It occurred