

BOOK REVIEWS

Robert T. Beyer

Department of Physics, Brown University, Providence, Rhode Island 02912

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Acoustics

Philip M. Morse and K. Uno Ingard

*Princeton U. P., Reprint (paperback).
xix + 927 pp. Price \$25.00.*

This volume is a paperback reprint of the 1968 edition, plus one sheet of errata. When the book originally appeared in 1968, the second edition of Professor Morse's earlier text (*Vibration and Sound*) was already 20 years old. In his review [*J. Acoust. Soc. Am.* **45**, 259 (1969)], my colleague, Professor A. O. Williams, Jr., balanced a review of the book's contents with a comparison to the coverage of material in the two texts. Now, a similar comparison is in order, since, as the reader may well be aware, the Acoustical Society of America brought out a reprinting of the second edition of *Vibration and Sound* in 1981. It is, therefore, appropriate to quote from William's review:

"The present text is just about doubled in length (in comparison with *Vibration and Sound*), largely through the addition of five chapters of material not earlier included; these contributed 60% of the added length... Very definitely. *Theoretical Acoustics* is a text, not a monograph or handbook. It introduces mathematical methods and carries the student through successively more advanced levels of theoretical treatment. There are plenty of problems, an average of 17 per chapter. These range from numerical essays on derived results to expansions of the chapter's analysis and extensions of the theory. Many problems are developed in some detail, to guide the student through exercises. It is a good book, a worthy extension of *Vibration and Sound*. Whether it is a replacement—whether you can throw away the earlier well-thumbed text—is for you to decide after comparison; some degree of simpler presentation and some amount of applied discussion would certainly thereby be lost."

One final remark. When the review copy reached the writer, it contained a slip indicating that the price was \$75.00, which seemed extremely high. Since then, the writer has also received an advertising card on the book, giving the price at \$25.00. Let us hope that the latter price is the correct one!

ROBERT T. BEYER

*Department of Physics
Brown University
Providence, Rhode Island 02912*

Patterns of Sounds

Ian Maddieson

*Cambridge U.P., Cambridge, 1984.
ix + 422 pp. Price \$29.95.*

It is not easy to know what to make of this book for people who read our journal and attend our meetings. For such people, surely, the science of phonetics rests upon a foundation of physiological and acoustic research, as well as psychological testing of hypotheses on the information-bearing elements of the acoustic signal and their underlying articulatory mechanisms. Readers with this outlook may find themselves feeling uncomfortable over the author's eclectic use of mainly impressionistic phonetic statements from a wide variety of sources of, seemingly, varying levels of reliability. This is generally so even though Maddieson, who is certainly not unsophisticated in these matters, does occasionally draw upon instrumental or psychological research.

The book is not one to be read from cover to cover. Rather, it is a reference book based on the UCLA Phonological Segment Inventory Data-

base (UPSID), which resembles in some respects the nearby Stanford Phonology Archives (SPA). UPSID contains 317 languages, one from each major subgroup of each language family. This genetic sampling is meant to be typologically representative.

There are ten chapters: (1) The size and structure of phonological inventories; (2) Stops and affricates; (3) Fricatives; (4) Nasals; (5) Liquids; (6) Vowel approximants; (7) Glottalic and laryngealized consonants; (8) Vowels; (9) Insights on vowel spacing (contributed by Sandra Ferrari Disner); and (10) The design of the UCLA Phonological Segment Inventory Database (UPSID). There are two appendices that make up more than half of the book: (A) Language lists and bibliography of data sources, and (B) Phoneme charts and segment index for UPSID languages.

The book is really meant for linguists who need a statistically reliable base for the discovery of generalizations about phonological inventories that will be useful "in the formulation of phonological theories, in evaluating competing historical reconstructions, in constructing models of language change and language acquisition..." and can stimulate "important linguistically-oriented phonetic research" (p. 1). Indeed, even without computer access to UPSID itself, the linguist can make use of the well-planned organization of the book for such goals. Of course, the speech scientist who is not also a card-carrying linguist may well be interested in at least the last use mentioned. For the sake of this review, I have done a simple little test of the book by raising two questions that a speech scientist might ask. One is about how many languages, if any, exploit a given possible mechanism. The other concerns the accuracy of the phonetic statements taken from the literature.

In connection with questions of excitation switching, one might want to know whether systematic use is made in any language of the possibility of moving from the local turbulence of a constriction in the supra-glottal vocal tract to continued noise excitation of the vocalic formants of the relatively unimpeded tract upon release of the constriction, for some time before the onset of glottal pulsing as the next source. That is, just as there are aspirated stop consonants, are there also aspirated fricatives? (My hypothetical questioner finds the posited succession of events physiologically and acoustically plausible.) After a careful reading of Chap. 10 to learn the rules, one inspects the Segment Index (pp. 205–262) and finds, under "Fricatives," an entry called *Voiceless aspirated dental/alveolar sibilant fricative /"s^h"/* found in three languages: Burmese, Karen, and Mazahua. (Maddieson uses quotation marks around symbols to indicate imprecision in his sources as to exact place of articulation.) One then consults the *Alphabetic list of languages with key to sources* to find the phoneme charts, where the consonant in question can be viewed in a paradigmatic array of all the phonemes arranged as intersections of largely traditional phonetic features. Thus, for example, in the Sgaw dialect of Karen described by R. B. Jones in 1961, chart 516 shows aspirated /s^h/ in contrast with plain /s/ and a rare voiced /z/, along with other fricatives. With only three languages in the data base showing this consonant type, we are further intrigued to find that two of them, Karen and Burmese, are genetically related in the Sino-Tibetan family, although they are in two branches of it, Karenic and Lolo-Burmese, respectively. (What we are not told is that there is extensive co-territoriality of these two languages in Burma.) The third language, Mazahua, is a member of the Oto-Manguean branch of "Northern Amerindian." The latter information has to be found by scanning the *Genetic listing of languages and outline classification* (pp. 174–177); there is no cross referencing between the lists.

As a way of testing for accuracy, I studied chart 400 on Standard Thai, a language I have worked on for a long time both impressionistically and instrumentally. I was dumbfounded to learn that Thai has a voiceless dental sibilant affricate /tʃs/ and a voiceless aspirated dental sibilant affricate /tʃs^h/. Turning to the alphabetic list, I find that the author's sources are studies by Noss in 1954 and 1964 and Abramson in 1962! Both Richard Noss and I follow Mary Haas in describing these plosives as voiceless unaspirated and aspirated palatal or, perhaps, palato-alveolar affricates. Both

of us as Thai speakers of a certain fluency and, I believe, accuracy, would certainly agree that anything resembling a dental affricate would be a mispronunciation. Of course, Maddieson, a very reputable phonetician in his own right, could show Noss and me to be wrong, but he simply cites us without comment. I hasten to add, however, that casual inspection of the charts of other familiar languages does not reveal anything so egregious, although I am doubtful about some of the descriptive labels here and there.

Cambridge University Press deserves no praise for its use of inelegant double-spaced, pale typescript for this book. The available technology makes possible much clearer and darker single-spaced, camera-ready copy.

Maddieson has produced a book that every speech laboratory will want to have as a handy reference. Insofar as one is willing to make allowances for the varying reliability of the many sources consulted to form the data base, the investigator can indeed test a wide range of hypotheses on phonemic patterning across a representative sampling of languages. The chapters in the first half of the book are interesting, well-written expositions of the topics and the many difficult obstacles encountered in a task of this size.

ARTHUR S. ABRAMSON

*Department of Linguistics
The University of Connecticut
Storrs, Connecticut 06268*

*Haskins Laboratories
270 Crown Street
New Haven, Connecticut 06511-6695*