plications of Detection Theory (part 3) includes tasks involving multiple or repeated stimulus presentation, temporal structure, and signals of uncertain frequency. Some of these data are used to explicate the notion of the "critical band" of the ear. There is a chapter on applications to speech recognition. The final chapter covers preliminary applications to various substantive problems bordering on psychophysics, including animal psychophysics, sensory physiology, reaction time, time discrimination, vigilance, attention, subliminal perception, and recognition memory.

The authors' aim of providing a source book and a textbook is realized in the appendixes and the problem sets (with even a few solutions) at the end of the first eight chapters. Appendix 1 gives the elements and only the elements of probability theory required to follow the development of statistical decision theory. It is compact and admirably done. Appendix 2 presents some basic concepts of waveform analysis. It is quite uneven in level of difficulty. Appendix 3 is a compendium of techniques both useful and necessary to supplement the discussion of the book.

Signal Detection and Psychophysics is very nearly the most important single monograph on psychophysics published yet in this century. It will be and deserves to be widely influential, because it is a lucid presentation of the not quite revolutionary ideas of the new psychophysics. Since this is so, a few cautionary words are in order. The theory has not been reinterpreted very far in terms appropriate to human behavior, being still tightly bound to electrical systems. A consequence is that most applications are mere analogs, or are far-fetched, and some depend on outrageous assumptions. The ideal-observer theory is a normative theory and could have the effect of delaying rather than inducing a search for actual mechanisms. Because the human observer may and no doubt does introduce unknown noises, an appropriate ideal observer may never be found. Few if any serious tests have been made of the crucial, almost certainly wrong, assumptions that noise and signal trials are independent and that sequential effects hardly matter. Data are fitted by eye to theoretical ROC curves because optimal tests "have not yet been devised," though such fits are widely interpreted as being favorable to the theory.

Whatever the degree to which one can accept the psychophysical signal-detection theory, it is a seminal theory and has already revitalized psychophysics and its applications. It will be seen 25 years hence as a major influence, if only because of having made a clear distinction between sensitivity and criterion. *Signal Detection and Psychophysics* is an excellent source book and is highly recommended for use as a text, though it is far more than a textbook.

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Hepaticology

The Hepaticae and Anthocerotae of North America—East of the Hundredth Meridian. Vol. 1. RUDOLF M. SCHUSTER. Columbia University Press, New York, 1966. 822 pp., illus. $20.

Rudolph Schuster's latest contribution to hepaticology is indeed impressive in its dimensions, and the abundant illustrations are very well executed. The bibliography is extensive, and the historical outline is interesting and instructive. Unfortunately, the quality of the work progressively deteriorates after the historical outline until, in the systematic section, the text has become so encumbered with technical errors, both of omission and of commission, as to render it of little value.

The extensive coverage of evolution in the Hepaticae is included under seven subheadings in four chapters and involves much redundancy and numerous cross-references. This material is notably slanted in favor of the author's concepts. A misleading footnote on page xi notwithstanding, the bibliography contains references through 1965 and the text itself contains abundant references up to and including 1966. Such important works as those of Church (1919), Fulford (1951, 1964, 1965), Proskauer (1960), and Mehra (1957), however, are given irrelevant or merely incidental mention or none at all.

Little of the adequately documented material included in the voluminous section on morphology will be new to the professional, while much of it is badly confused and contains numerous, often startling errors. The poor quality of the writing, coupled with the author's repeated allusions to exotic genera and species and the frequent untranslated quotations from German, Latin, and French sources, will quickly discourage the casually interested professional as well as the beginning student.

The final section of the book, devoted to systematics, is poorly organized and written, and established rules of nomenclature are disregarded. For example, pages 726–37 are devoted to an elaborate discussion of the genus *Lophochaete* Schust (December 1960). This name exists only as a synonym of the genus *Pseudolepicolea* Fulford & Taylor (February 1960).

In conclusion, I must say that the nonspecialist will find little of value in this book aside, possibly, from the illustrations, while the experienced professional will have need for it merely in the interest of documentation. Finally, in view of the quality of the text and the fact that the National Science Foundation "undertook most of the cost of publication" (p. x), I consider the price of the book to be exorbitant.

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Extracellular Fluids

Brain Tissue Electrolytes. A. VAN HARREVELD. Butterworth, Washington, D.C., 1966. 183 pp., illus. $7.95.

This small volume deals with an extensive and widely scattered literature on a subject that has generated considerable interest and controversy during the past decade. Because Van Harreveld has been an imaginative and resourceful contributor to investigations of the composition and volume of extracellular fluid his book is of special interest. A most useful aspect of the book is the discussion of specific impedance of central nervous tissue and its relationship to the phenomenon of spreading depression, and of the relationship between tissue resistance and the size of the extracellular fluid compartment. It was these questions that initially stimulated Van Harreveld's interest in the general subject of brain electrolytes. His discussion leads to a description of the work he has done, using histochemical methods, on the anatomical locus of chloride and the movement of this ion to an intracellular site during asphyxia and spreading depression. The section on electron microscopy deals primarily with Van Harreveld's important work in applying the technique of freeze-