two different types of charges—one an internal polarization and two the deposition of ions on the surface.

Chapter 2 by Sessler includes an analysis of the fields, forces, and currents due to charged dielectrics. Also covered are isothermal decay processes. This is important in determining the life time of the devices.

Chapter 3 by J. van Turnhout discusses the investigation of electret properties by thermally stimulated discharge (TSD). The TSD method has provided extensive information on dipolar and trapped charge effects in dielectrics.

Chapter 4 by B. Gross presents a review of radiation-induced effects in dielectrics. One particular type of radiation, namely charging by electron beams, has become one of today's favorite poling methods.

Chapter 5 by M. G. Broadhurst and G. T. Davis of the U. S. Bureau of Standards describes piezo- and pyroelectric properties of polymer materials. While the connection between electrets with preferentially oriented dipoles and piezoelectricity and pyroelectricity was appreciated as early as 1927, it was not until the large piezoelectric effect was found in polyvinylidene fluoride (PVDF) by Kawai that this effect was investigated further. This chapter presents several theories of the effect.

Chapter 6 by S. Mascarenhas discusses electrets in biomaterials and biopolymers. Bioelectrets do play an important role in life processes.

The final chapter by Sessler and J. E. West (Bell Telephone Laboratories) deals with the many applications of electrets and piezoelectric polymers. While microphones and xerography are the largest applications, there are many other potential applications which may develop in the future.

Altogether the book lives up to the expectations of the authors, namely as a cohesive treatment of the entire field of electrets.

WARREN P. MASON
Columbia University
New York, New York 10027

Perception and the Senses

Evan L. Brown and Kenneth Deffenbacher
Oxford University Press, New York, 1979.
xii + 520 pp. Price $16.95.

This textbook is designed for use in upper division courses on sensation and perception. Considerable effort has been expended in its preparation. Each chapter is carefully summarized and is supplemented by a glossary. The illustrations are good and well-produced. There are numerous references in the body of the text, and each chapter contains a section with suggestions for further reading. A useful guide to library research is included as an Appendix, which lists the major journals in the field, reference aids, major secondary sources, and so on.

The book is orgainzed in the following way. Part 1 consists of a single chapter that describes the ethological, physiological, and psychophysical approaches to the study of sensation and perception. Part 2 consists of three chapters devoted to the "minor senses." The first chapter deals with the skin senses, the second with movement and active touch, and the third with the chemical senses. Part 3, which also consists of three chapters, is devoted to hearing. The first chapter is concerned with the nature of sound and subjective auditory attributes. The second is concerned with neutoanatomical and neurophysiological substrates of auditory perception. The third chapter deals with relatively complex phenomena such as the perception of auditory sequences, auditory aftereffects, and speech perception. Part 4 consists of five chapters dealing with vision. The first discusses the physical and biological bases of vision. The second chapter is concerned with the processing of brightness, lightness, and color. The third deals with figure-ground phenomena and visual shape perception. The fourth is concerned with perception of size and distance, and the fifth with visual perception of direction and motion. Part 5 consists of a single concluding chapter, which assesses the development, state of knowledge, and prognosis for the future of the field, with emphasis on the role of technology.

The general orientation of the book is strongly biological. The discussions of neuroanatomy and neurophysiology are detailed and informative. There is also a strong emphasis on ethology; discussions of the evolutionary value of different sensory mechanisms abound, and interesting interspecies comparisons are often made.

On the other hand, the book lacks sophisticated treatment of cognitive mechanisms related to perception. The concept of separate storage boxes for very short term memory (VSTM), short term memory (STM), intermediate term memory (ITM), and long term memory (LTM) is accepted uncritically, though recent research has shown this view to be inadequate, both for visual and for auditory configurations. Attentional phenomena also receive a scant and rather unbalanced treatment which focuses almost exclusively on low-level factors.

The final chapter that deals with the role of technology in the development of knowledge concerning sensation and perception provides the student with a useful perspective. However, given the strong biological orientation of the book, it is surprising that there is no mention of the recently developed neuroanatomical techniques which are currently revolutionizing the field. For example, the use of radioactively labeled deoxyglucose enables us the first time to determine, by noninvasive methods, the structures that are activated when the organism is confronted with specific stimulus configurations. Another new and important technique not mentioned involves the use of horseradish peroxidase in tracing connections.

On the whole, however, the book is interesting and informative. For advanced students, especially those with biological interests, it should serve as a useful text and reference source.

DIANA DEUTSCH
University of California at San Diego
La Jolla, California 92093

Intervals, Scales and Temperaments

Llewellyn S. Lloyd and Hugh Boyle
St. Martins Press, Inc., New York, 1978.
xix + 322 pp. Price $15.00.

This book is a revision of one that was first published in 1963. The prefatory material states that the purpose of the book is to provide an introduction to the study of musical intonation. An additional purpose identified in the Introduction is to relate the facts of musical acoustics to the musical experience. Citations of literature in musical acoustics and to interpretation of music history and theory are, for the most part, to sources no more recent than 1963. The exceptions are the three books by Donnington, Benade, and Jorgensen, found in the four book bibliography on page 298.

Part I of the book is a coherent selection of papers written by Ll. S. Lloyd that are arranged in excellent order. These papers are followed by a complete list of Lloyd's writings on Musical Acoustics. Reading these chapters, I wished that Boyle would have referenced the original locations of the material in the article. Instead, the reader must scan the entire list to find these citations. I could not determine from the book to what extent, if any, the original articles have been edited or provided with new footnotes. Such matters have no bearing on the quality of the information, but would clarify the interaction between the writings of Lloyd and Boyle.

Part II, the Introduction, and the Appendices are the work of Hugh Boyle. These sections are, in many aspects, an expansion or explanation of the publications of Lloyd. In other aspects, we find commentary on music history and material for in-depth study of the laws of vibrating strings. The material by Boyle contains numerous interesting and surprising references to music theory, psychoacoustics, and musical instruments. The author does not make clear his use of the work of other authors or of observations that are the result of his own scholarship or research. The references and footnotes citing the literature and research in the area of musical scales form a short