

Clark's group in Melbourne, Australia, are highlighted in the chapter titled "A History."

In the remaining chapters, Clark provides a basis for understanding the challenges researchers face regarding the coding and transmission of acoustic information to the auditory nerve using electrical stimulation. These chapters address subjects including neurobiology, electrophysiology, psychophysics, speech and sound processing, engineering, surgical anatomy, and surgical pathology. The author describes in detail cochlear-implant surgery and the impact of the devices on patients' lives after implantation. The book concludes with his vision about important remaining questions and ideas for future research.

In some ways, *Cochlear Implants* is easy to criticize. Although the book covers a number of subjects, the quality of information presented in each chapter varies. The clinically related topics and the description of the cochlear-implant electrodes are well organized. In contrast, the chapters on basic science would have benefited from having experts in those fields edit or offer their contributions to those chapters. It is unclear why some topics are not covered or are covered only superficially, or why Clark uses so many case reports instead of simply summarizing results. Moreover, the repetition of details and frequently used jargon challenge a broad audience. The book would have benefited from a good editor who could have condensed the writing and thereby shorten the text.

These criticisms, though, fail to capture the real essence of Clark's book. His true mission is not to turn readers into experts but, rather, make them fall in love with the subject. Through his personal recollections, the author seeks to excite readers by allowing them to participate in the experiences of the early pioneers.

Few books are available today that

summarize the field and can be used to educate a broad audience or to teach audiology and otology students, and most are proceedings from scientific conferences. Only a few books like Clark's have made an attempt to cover the entire field. Examples of such excellent texts are *Cochlear Implants* (College-Hill Press, 1985), edited by Roger Gray, and *Cochlear Implants: Principles & Practices* (Lippincott Williams & Wilkins, 2000) edited by John Niparko and others. Compared with those earlier books, Clark adds little new knowledge except for the many case reports and detailed descriptions of the development of cochlear implants and cochlear implantation in Australia.

Cochlear Implants: Fundamentals and Applications, a vivid recollection by one of the pioneers in cochlear implantation, gives insight into the struggles of implementing new technologies to help hearing-impaired individuals. It also colorfully documents how the development of new technologies affects a field and its success.

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The Cold Wars: A History of Superconductivity

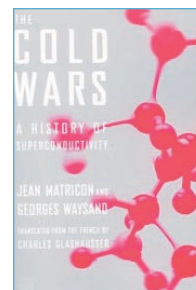
Jean Matricon and Georges Waysand (translated from French by Charles Glashausser)
Rutgers U. Press, New Brunswick, NJ, 2003. \$65.00, \$26.00 paper (271 pp.). ISBN 0-8135-3294-9, ISBN 0-8135-3295-7 paper

The Cold Wars: A History of Superconductivity provides an engaging historical narrative about the evolution of low-temperature physics with a focus on superconductivity. The book, written for a scientifically liter-

ate audience, is enriched by numerous anecdotes that illuminate the personalities of the diverse individuals who played a role in a tale that covers more than 180 years.

Jean Matricon participated in the theoretical group of Pierre-Gilles de Gennes in Orsay, France, during the "golden age" of low-temperature physics in the 1960s; Georges Waysand continues to conduct experimental research on superconductivity and has had an interest in relations between science and society. The authors' comments reveal their views about the sociology of science and their thoughts about increasingly frequent conflicts between the ideal of science for the sake of understanding and science as a utilitarian activity aimed at personal or national advancement.

The story begins with Michael Faraday's success in liquefying chlorine in 1823. Then, in 1877, Raoul Pictet and, independently, Louis Cailletet liquefied oxygen. In 1908 in Leiden, the Netherlands, Heike Kamerlingh Onnes liquefied helium, which provided the cooling needed for the discovery of superconductivity in mercury in 1911. After offering readers this historical background, the authors shift the discussion from obtaining "cold" to solving the mystery of superconductivity. For example, Matricon and Waysand give an insightful account of the old controversy surrounding Kamerlingh Onnes's role in the crucial experiments that led to the discovery of a transition to zero electrical resistance below a critical temperature T_c (approximately 4 K for mercury). They conclude that an unsung hero, a graduate student named Gilles Holst, was largely re-



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sponsible for the actual measurements. On the other hand, the authors identify Kamerlingh Onnes as a founder of "big science" because he established a large laboratory with advanced facilities and trained the technical staff who made the experiments possible.

The story continues with a chronological exposition of scientists' contributions toward understanding the superconducting state and its properties. The research involved a large cast of characters, and the following partial list (in no particular order) gives a sense of the book's coverage: Fritz London and his brother Heinz; Lev Landau; Peter Kapitsa (the authors include Kapitsa's correspondence with Joseph Stalin, Lavrenti Beria, and Vyacheslav Molotov that requests Landau's release from imprisonment as an "enemy of the state"); Lev Shubnikov (who unfortunately was summarily executed under Stalin's regime); David Schoenberg; Brian Pippard; John Bardeen; Leon Cooper; J. Robert Schrieffer; Brian Josephson; Bernd Matthias; Nikolai Bogolyubov; Kurt Mendelssohn; Georg Bednorz; K. Alexander Müller; Paul Chu; Philip Anderson; Pierre-Gilles de Gennes; Richard Feynman; Vitali Ginzburg; Ivar Giaever; Herbert Fröhlich; and Walther Meissner.

How does this book compare with others of its genre? Although many texts deal with the subject of superconductivity, few explore the historical development of ideas in such detail at an accessible level. The style of Matricon and Waysand's book resembles that of Mendelssohn's excellent but dated *The Quest for Absolute Zero: The Meaning of Low Temperature Physics* (McGraw-Hill, 1966). But Mendelssohn's book, unlike *The Cold Wars*, does not focus on superconductivity specifically. *Superconductivity* (World Scientific, 1994), by Vitali Ginzburg and E. A. Andryushin, aspires to be, as its authors say, "the simplest of all popular books" on the subject. An insider's narrowly focused account of the hectic days when researchers were sorting out the yttrium barium copper oxide class of superconductors is available in *The Breakthrough: The Race for the Superconductor* (Summit Books, 1988), by Robert Hazen.

My brief review of *The Cold Wars* obviously cannot cover the specifics of all the contributions of many scientists to superconductivity, but the authors are quite successful in giving a nontechnical overview of all the contributions to our current understanding of the classic type I, type II, and high- T_c superconductors. The book is,

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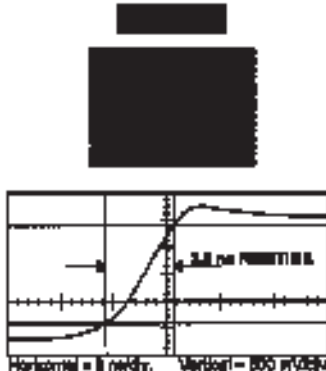
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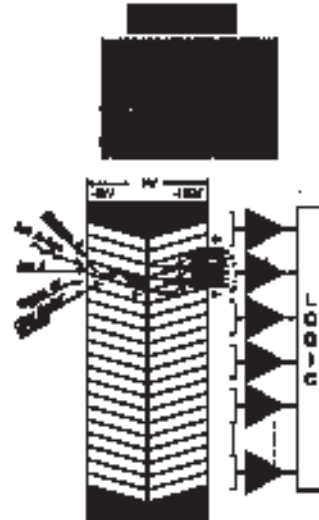


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as indicated by its subtitle, a *history* of the subject. *The Cold Wars* is not designed to anticipate a glorious future; on the contrary, it projects a skeptical view of future prospects and a rather ambivalent view of recent developments that are based on the detailed chemistry of specific new materials.

Michael Tinkham
*Harvard University
Cambridge*

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