of on the continent. It is to his credit that a very high percentage of his letters were preserved. In fact, from this new biography one can almost know what he was thinking about week-by-week after injuries incurred in a riding accident prevented him from continuing to go to sea.

Maury has usually been considered the father of physical oceanography in this country. In my opinion, he actually contributed much more to climatology and to physical geography, but the practical applications of his pioneering pilot charts have usually attracted the most attention.

Frances Leigh Williams does not try to refight the Civil War or to evaluate Maury as a scientist. She simply records what happened.

It is significant that about 240 pages of this book are devoted to notes, bibliography, and index. The reader is entirely free to judge the scientific contributions of an interesting man and to enjoy the contemporary picture of the Navy, life in Washington, the Civil War, and the European scene.

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AGARD-NATO Symposium

Advances in Materials Research in the NATO Nations. Proceedings of a symposium held at NATO, May 1961. H. Brooks, N. H. Mason, N. E. Promisel, and G. H. Cooper, Eds. Published for the North Atlantic Treaty Organization by Pergamon Press, London; Macmillan, New York, 1963. x + 549 pp. Illus. $15.

In May 1961, a symposium on materials research, organized by the Structures and Materials Panel of the Advisory Group for Aeronautical Research and Development (AGARD) of NATO, was held in Paris. The symposium was held at the request of Frederick Seitz, then science advisor to NATO, in recognition of the importance of materials in modern technology. It was hoped that bringing together people interested in fundamental research, in applied research and development, and in the organization and management of research would stimulate and make more effective materials research in the NATO countries. The volume under review records the proceedings of that symposium.

The volume is in three parts: Fundamental Research; Role of Basic Research in Development; and Organization. The first part consists of an introduction and review by Harvey Brooks, a keynote address by Seitz, and a series of 18 talks in which leaders in their fields review various aspects of basic research on materials, including such topics as polymers, diffusion, surface properties, dislocation theory and observation, flow and fracture, energy bands, superconductivity, semiconductors, and ferromagnetism. The papers are somewhat uneven in scope, ranging from reviews of broad areas of research, designed for the nonspecialist, to rather technical discussions based mainly on original research. The second part provides examples of cases in which basic research has made significant contributions to particular developments as well as more general discussions of the ways in which advances in basic understanding aid development. The third part contains interesting discussions of the way scientific research in general and materials research in particular are organized in various NATO countries: Canada, France, Netherlands, Norway, Great Britain, and the United States.

By far the greatest emphasis is on structural properties, an area in which there is perhaps the greatest gap between basic research and practical developments. Only a dozen or so pages are devoted to semiconductors and ferromagnetism where applications depend very directly on basic research and where the same people are often involved in both. In the past, structural materials have been developed largely by empirical cut-and-try methods in which research on basic physical processes and electronic structure have played only a minor role. It is evident from the reviews presented here that tremendous strides have been made in fundamental understanding and that the gap, while still wide, is closing. Both approaches are important, and both will continue to be important in the future.

The book should be of interest mainly to those doing basic or applied research in structural properties of materials and to those in scientific administration.

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Chemical Analysis

Complexation in Analytical Chemistry. A guide for the critical selection of analytical methods based on complexation reactions. Anders Ringbom. Interscience (Wiley), New York, 1963. x + 395 pp. Illus. $15.

Complexation reactions owe their widespread use in chemical analysis chiefly to the work of Gerold Schwarzenbach, whose group, two decades ago, pioneered studies on ethylenediaminetetra-acetic acid (EDTA) and other exceedingly effective complexing agents based on the aminopolycarboxylic acids. Titrations with these "chelating" agents proved generally applicable to the great majority of metal ions, and EDTA has become a household item in all analytical laboratories. In 1957 Schwarzenbach published a monograph in which he developed the theory of "complexometric titrations" and gave procedures for a number of specific determinations. Anders Ringbom's intent is to extend Schwarzenbach's treatment and show "how to compare, without involved calculations, existing methods to determine their relative accuracy; how to choose the most favorable experimental conditions for each analysis; how to calculate and eliminate the interference of various side reactions; how to develop new methods for solving special analytical problems." He has fulfilled these aims with admirable lucidity, in a book which every analytical chemist should find useful and stimulating.

To simplify the involved calculations necessary for intelligent application of complexometry, Ringbom introduces the concepts of side-reaction coefficients and conditional stability constants. He applies the method consistently throughout the book and illustrates its effectiveness with numerous example problems. An appendix contains tabulations of coefficients for many common side-reactions as well as a long list of the equilibrium constants most likely to be needed.

Ringbom begins with a brief survey of complexation reactions, then presents a sensible approach to the law of mass action (in which he neatly sidesteps the sticky problem of concentration versus activity by pointing out that 0.1 log unit, an uncertainty quite acceptable for most calculations, covers the activity coefficient variation for most ions in the ionic strength range