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Book Reviews

Nuclear Reactions Volume II. Edited by P. M. Endt and P. B. Smith, North-Holland Publishing Co., Amsterdam; John Wiley and Sons, Inc., New York (1962), 542 pages, $18.50.

In 1959 P. M. Endt and M. Demeur edited a collection of articles entitled *Nuclear Reactions Volume I,* which was notable for a number of useful reviews of various aspects of reaction theory. The collection as a whole provided an overall survey of the field that was particularly valuable to the experimental physicist (and to many theoretical physicists) who wanted to see the forest of nuclear physics and not be distracted by the trees of calculational detail. In their preface to this first volume, the editors promised a succeeding volume to cover topics omitted from the first. Their promise was kept with the publication early in 1963 of the volume under review.

The editors have not been as successful here as in the previous volume in gathering a unified collection of articles. In effect, they excuse themselves in their preface for the potpourri nature of the selections. Over half the book (287 pages) is occupied with a set of tables of "coefficients for the analysis of angular correlation measurements of the radiative decay of aligned nuclei." These will surely be of great use to those engaged in such experiments but are freight of doubtful value to the less specialized reader. Most of the rest of the book is taken up with three survey articles that continue the tradition of *Volume I:* J. M. Aranjo writes on the vibrational states of spherical nuclei. E. G. Fuller and Evans Hayward provide an authoritative review of the nuclear photoeffect and of the ways in which the associated giant resonance is described (but not explained). Probably of most interest to readers is a 70-page review article on nuclear fission, by J. R. Huizenga and R. Vandenbosch, that was already three years old at the time of publication. It is comparable to, and more recent by a year than, Halpern's survey in the 1959 volume of *Annual Reviews of Nuclear Science.* Despite the large amount of new material that has since appeared, Huizenga's survey is still of considerable interest as a thoroughgoing exposition of what might be called the continuum nuclear model picture of the fission process. Finally, the lead-off article deviates from the theme of the book by being concerned not with nuclear reactions but with some instrumental techniques involved in experiments on nuclear reactions. S. D. Bloom writes briefly of nanosecond time-of-flight work with pulsed machines. Although the last few years have seen significant new developments in pulsed-ion sources and processing techniques, the article remains a convenient overall view of the fast time-of-flight field not otherwise available.

From this description of its contents, it is clear that *Nuclear Reactions Volume II* is one of the current flood of "nonbooks" occupying a position somewhere between a review journal and a coherent monograph. This doesn't necessarily damn it out of hand. Under today's pressures, it is probably the only way you'll get competent people to do any writing. But the volume shares one problem with its fellow expensive nonbooks. Usually there is only about ten percent or so of such personal interest that you'd like to have it on your own shelves at immediate reach. And the publishers have devised no way of letting you do so, other than paying out the high price (here $18.50) for the whole book. Since the publishers strictly forbid recourse to the photocopying machines, the only other way out is to try to get a copy to review--as I have done; but it's obviously a singularly inefficient process.

This review is no competition for pistol-packin' Yost, but then you can't expect a dry-as-dust Easterner to match up to the purple-sage lyricism of a true Westerner. It'll just have to do.

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About the Reviewer: Herbert Goldstein is known for his accomplishments in many activities—radar research during World War II, shielding research, cross-section evaluations, author of Classical Mechanics *and* Fundamental Aspects of Reactor Shielding, *and teacher. He was a Lawrence Award winner in 1962 and is now Professor of Nuclear Science and Engineering at Columbia University. The editor will be pardoned the personal and prideful remark that he was the reviewer's first physics instructor.*

The Sorby Centennial Symposium On The History Of Metallurgy. Sponsored by the Society for the History of Technology, the American Society for Metals, and the Metallurgical Society of the American Institute of Mining, Metallurgical, and Petroleum Engineers. Edited by Cyril Stanley Smith, Institute Professor at the Massachusetts Institute of Technology. Published by Gordon and Breach Science Publishers, Inc., New York, New York (August 31, 1965), 580 pages. $12.50.

Volume 27 of the Metallurgical Society Conferences commemorates the 100th anniversary of the discovery of the microstructure of steel by Henry Clifton Sorby. The Conference was organized by Professor Smith and was held in Cleveland, Ohio, October 22-23, 1963. The book is a permanent record of the Conference. It comprises 33 serious and factual papers by 36 authors from six countries, and it gives a well-balanced survey of technological accomplishments in ferrous and nonferrous metallurgy during the past century.

Following a summary of the technology of iron manufacture in Britain during 1850 to 1860, and of Faraday's contributions to it, two papers detail Sorby's pioneer work; and seven papers describe and evaluate its influence on the accomplishments of prominent metallurgists in England, France, Germany, the United States, and the USSR.

In a strict sense, the authors of the papers do not give a true history of metallurgy, because they write as scientists and not as historians. Nevertheless, their writings accurately describe significant accomplishments by practical metallurgists, and therefore, they have definite value as a record of an important new development.

Particularly interesting and enjoyable are autobiographical contributions by Coolidge, Jeffries, Bain, Orowan, and Taylor; they are genuine source material for future historians, because they record outstanding human accomplishments. Six following papers describe the developments of useful industrial materials that would have been impossible without the codevelopment of industrial research laboratories.

The larger portion of the book is composed of 19 papers that recount early efforts to appraise the complex relation of structures and properties. Successes in the fields of recrystallization, martensite, superlattice concepts, dislocations, magnetic materials, and powder metallurgy were truly remarkable, in spite of the limitations imposed by the equipment that was used. The beta-iron controversy would not have occurred if modern instrumentation had been available to Osmond in 1885. Martens and others would have known about Sorby's novel use of the optical microscope and could have expedited their researches, if electronic communication had been established when Disraeli first guided the growth of the British Empire. And Merica and his associates at the National Bureau of Standards could have enhanced their epoch-making paper greatly, when they explained precipitation hardening in 1919, if an electron microscope and a probe analyzer had been available for their use.

The book and its more than 1200 references can be used by metallurgists to understand the progress in their profession, and by historians to explain man's technological thinking. They will not find unanimity of thought among all contributors, particularly in relation to unit structures. This reviewer admires the inclusion of Moore's and Etheridge's contribution to precipitation hardening, which was independent of (and contemporary with) that of Wilm, although security during World War I delayed publication of the data until 1921.

However, small differences are insignificant when the book is considered in its proper perspective—the advance from the microscopical petrography of meteorites to metallography and electron microscopy, and the uses of these improved tools for industrial development. Nor is it important whether or not Sorby saw a true Widmanstatten structure in wrought iron on July 28, 1863. But, it is important that Sorby initiated a new era in metallurgy that laid the foundation for the structure-property relationship and that Smith's untiring efforts have made this history available for all to read.

The book will delight the older men who shared in the progress in materials science. It should be required reading for today's young scientists for appreciation of the past and for guidance in their present and future work.

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About the Reviewer: Although he is now retired from an association with the International Nickel Company (which began in 1920 immediately following completion of his graduate studies at Columbia University), the reviewer remains active as an abstractor for Chemical Abstracts, a consulting editor for Metal Progress, and a consultant for the Du Pont Company. During his tenure with International Nickel, lastly as assistant to the President, W. A. Mudge discovered precipitation hardening of nickel and the procedures for commercial-scale production of nickel-clad and nickel-alloy-clad steels.