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Elements of the Universe. By Glenn T. Seaborg and Evans G. Valens. 253 pp. E. P. Dutton & Co., Inc., New York, 1958. \$3.95. *Reviewed by Serge A. Korff, New York University.*

THIS book is intended to acquaint school children with the principal facts pertaining to the periodic table of the chemical elements. The authors do indeed start out in this direction, and the opening chapters are a basic discussion of what elements are and how a periodic table is built up. Yet in the second chapter we find sections by prominent persons, such as a section on "How to make a cyclotron" by Ernest O. Lawrence, another on "Neptunium" by Edwin M. McMillan, and several other sections by well-known authors. The book becomes, therefore, more a history of the discovery of the transuranic elements told by the group which has done so much pioneering work in this field. By the time the reader has reached the last chapter, he encounters some quite sophisticated concepts. All of this is undoubtedly good to have recorded in this form, and will do the school children no harm, if they can follow the rapidly rising level. The photographs are interesting, the writing is good, and the current scientific history is well and simply told.

Approximate Methods of Higher Analysis. By L. V. Kantorovich and V. I. Krylov. Translated from 4th Russian Ed. by Curtis D. Benster. 681 pp. (P. Noordhoff, Netherlands) Interscience Publishers, Inc., New York, 1958. \$17.00. *Reviewed by George Weiss, Institute for Fluid Dynamics and Applied Mathematics, University of Maryland.*

IT is unfortunate that an English translation of this book did not appear some fifteen years ago because it would have certainly achieved the status, say, of Schiff's book in quantum mechanics. While there are many fine discussions of various topics in numerical analysis, the book on the whole strikes one as being outdated, both in the choice of subject matter and in the point of view. It is perhaps an interesting survey of Russian work in numerical analysis in the thirties, but many exciting developments have transpired since then, not the least of these having been the result of Russian work. All of these are necessarily absent from this volume, originally published in 1941.

The virtues of this book are simple to enumerate. They consist of the extensive, unhurried discussions on every topic treated, and the numerous detailed illustrative examples.

The subjects covered all concern the numerical solution of partial differential equations, and are written with the hand computer in mind. Perhaps the best chapter in the book is a long one on variational methods which covers the Rayleigh-Ritz-Galerkin method, which has been used extensively for elasticity problems and in quantum mechanics. There is obviously no discussion of the recent important advances made in the theory by Weinstein and Aronszajn, although the authors do describe an interesting and useful modifica-

FOR SPRING PUBLICATION

ELEMENTARY MODERN PHYSICS

by Richard T. Weidner and Robert L. Sells

This text is designed to be used as a part of, or immediately following, the general physics course for engineers and scientists. It gives the student a logically coherent and sequential account of the basic principles of the relativity and quantum theories, of atomic and nuclear structure, and of selected topics in molecular and solid-state physics.

NOTE THESE FEATURES

- ★ A brief review of classical physics precedes Chapter II which discusses the theory of special relativity in detail, particularly with respect to its use in developing the quantum theory.
- ★ Over 40 problems for each chapter with answers to the odd-numbered problems. Summaries are included at the end of each chapter.
- ★ The appendices include a quantitative treatment of the Schrodinger equation and its application to problems; discussions of electromagnetic waves and of wave packets; and the atomic masses.

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tion due to Kantorovich. The chapter on variational methods is followed by a long one on numerical methods for conformal representations. This makes use of such devices as the variational method, orthogonal polynomials, successive approximations, and numerical methods relating to Green's functions. There is much in this chapter that could be explored further, especially in light of the availability of digital computers. The chapter on difference equation approximations to differential equations is thoroughly outmoded by recent developments in the field. In particular there is no mention of stability or convergence questions, which is a serious deficiency in a book of this sort. Finally there is a chapter on series solutions, of which the outstanding feature is a discussion of some little-known work on the solution of infinite systems of linear equations.

In summary, while there is much valuable material in this book, there are serious deficiencies due to its age. Of course, there is no mention of methods which have been developed for digital computers. The work that is still valid, however, is usually well presented and comprehensive.

Russian for the Scientist. By John and Ludmilla B. Turkevich. 255 pp. D. Van Nostrand Co., Inc., Princeton, N. J., 1959. \$5.95. Reviewed by L. Marton, National Bureau of Standards.

MANY scientists in post-Sputnik days came to the conclusion that an elementary knowledge of Russian is a rather useful thing. As a consequence, all of us who came to this conclusion started struggling with grammars, dictionaries, language records, and all other means designed to master a difficult language. I must confess that I tried even kindergarten primers. Few of these are designed to help the practicing scientist and for this reason, even the best textbooks have a limited usefulness. The present short handbook was written by a well-known team of experts of the Russian scientific literature and I for one am convinced that it constitutes a great step forward in helping the average English-speaking scientist who wants to learn Russian.

The most important single feature of *Russian for the Scientist* is to build up a vocabulary based on recognition of scientific cognates. The preface explains: "Our idea is to exploit what the scientist already knows—his English terminology." This book is aided by the use of a limited number of drawings showing common scientific objects and by the skillful selection of scientific reading material. These last cover four selected areas: aeronautics, biology, chemistry, and physics. The reading material in physics is taken from a Russian high-school text, in contrast to the others, which were mostly drawn from the *Great Soviet Encyclopedia*. It may be an indication of the quality of Soviet instruction that the high-school text compares advantageously with the chapters taken from the *Encyclopedia*.

Having reported thus far only the best features of