

est in psychology, in particular in C. G. Jung's archetypes, is well known. Here we find reprinted two papers which are otherwise not easily accessible: One deals with the influence of the archetypes on Kepler (I,1023); the other discusses certain aspects of the unconscious, (II,1212). Particularly interesting is Pauli's opinion on extra-sensory perception (II,1228,1298). It is also impressive to see how much harder it is to be clear, even for Pauli, if one is not writing about physics.

Finally, one must express one's gratitude to the two editors, R. Kronig and V. F. Weisskopf, for collecting and editing this magnificent work, and to the publishers for presenting it so well. May one wish, however, for a third volume? Pauli wrote many additional lecture notes, and semi-public letters which should receive wider circulation; (e.g., his lecture notes in Zurich on quantum theory, quantum field theory, statistical mechanics, and optics; notes from summer schools, as Les Houches; his widely circulated letter to Schwinger on quantum field theory, etc.). These are not even listed in the two volumes here. Perhaps one should collect them as well; even though they were not officially published, they bear Pauli's imprimatur.

Aufgaben und Lehrsätze aus der Analysis. By G. Pólya and G. Szegő. Vol. 1, 338 pp., DM 34; Vol. 2, 407 pp., DM 38. Springer-Verlag, Berlin and New York, 1964.

Reviewed by Dagmar Renate Henney, The George Washington University.

"Was ist unterrichten?

Zum eigenen Erfinden des Lernenden systematisch Gelegenheit geben."

(Nach Spencer)

This motto precedes the famous two volumes by Professors Pólya and Szegő and its philosophy is felt throughout the text. These books do not merely represent a collection of exercises and theorems, but the main emphasis is put on the order of the material. The authors desire most of all to activate the reader into being able to pursue mathematical analysis at his own pace and with increasing interest and capability. The great popularity of these two volumes shows

beyond doubt that they were successful.

The first printing of the *Aufgaben und Lehrsätze* appeared in 1925. The 1964 printing is the third and corrected version. It seems that there are few other books in mathematics—with the possible exception of Euclid's *Elements*—which have sold so many copies. The books have been translated into many languages. Dover Publishing Company came out with a photograph version in 1945. The books are quoted frequently and are well known to almost every mathematician as classical references in mathematical analysis.

There are many books in the mathematical literature—in French even more than in German—which comprise a collection of exercises, the above two volumes presenting possibly the most renowned. The books are primarily designed for independent study for the student as well as for the professor and the researcher. Much time has been spent by the authors collecting problems in a meaningful and effective way so as to guide the reader in his study of mathematical analysis. Transmitting knowledge is only of secondary importance to the authors. They are primarily interested in instilling within the reader a fruitful attitude towards mathematical thinking and to further the discipline of his scientific thoughts which they deem extremely important in the study of mathematics. According to the authors' point of view, it is of no use to memorize certain rules for the correct thinking process of solving a mathematical problem; rather one has to digest them carefully and then be able to use them almost instinctively. The same thoughts have been expressed by Pólya repeatedly, see for example his book entitled *How to Solve It*.

The collection of exercises includes those which have been published previously and those which have been passed on to the authors by word of mouth. Some of them are new results which have been changed into the form of an exercise and are now formally published for the first time.

The first volume contains three parts of fundamental character. The second contains six parts which are designed to cover more specialized questions and applications. Each volume contains ex-

ercises in the first half of the book and their solutions in the following half. At the beginning of each chapter in the collection of exercises the reader finds explanations which are helpful in recalling the needed definitions and theorems and provide the necessary motivation for his research. Frequently a hint is given to simplify a solution.

It would be presumptuous of the reviewer to praise the mathematical power of these books. These two volumes by Pólya and Szegő are not only a powerful and very effective mathematical treatise on analysis, but a work of art as well.

Atomic Migration in Crystals. By L. A. Girifalco. 162 pp. Blaisdell, New York, 1964. \$3.75.

Reviewed by Stuart A. Rice, University of Chicago.

This slim volume is intended to be an introduction to the theory of diffusion in solids, designed primarily for the intelligent layman. It is, in my opinion, a very clearly written monograph which provides a good survey emphasizing the important physical principles. I would have liked to have seen more emphasis on the role of dynamics, i.e., vibrational structure, to supplement the microscopic interpretation in terms of statistics, but this is a minor demurrer.

In general, I believe Professor Girifalco has achieved his goal and that the book will also be useful as supplemental material in freshman courses.

Elements of Quantum Electrodynamics. By A. I. Akhiezer and V. B. Berestetskii. Transl. by Israel Program for Scientific Translations. (2nd ed.) 301 pp. Oldbourne Press, London, 1964. Distr. by Daniel Davey, New York. \$13.50.

Reviewed by Bruce W. Shore, Harvard College Observatory.

The respected text by Akhiezer and Berestetskii deserves a wider use in this country. By restricting their exposition to the electromagnetic field, the authors are able to provide a detailed discussion of the quantum theory of electrons and photons. Electromagnetic interactions are treated in the framework of the *S* matrix, following the approach of Dyson. The text discusses in detail, if a bit tersely, renormalization and the removal of divergences from the *S* matrix. The