

ing but always stimulating series of technical papers and less specialized reviews and summary. Thomas, Saxon, Weisskopf, Gugelot, and many others guarantee the authenticity, if not always the correctness, of the work.

Proceedings of the 1954 Glasgow Conference on Nuclear and Meson Physics. Edited by E. H. Bellamy and R. G. Moorhouse. 352 pp. Pergamon Press, London and New York, 1955. \$9.50. *Reviewed by* Erich M. Harth, *Duke University.*

It has become clear with the publication of these proceedings that the lasting success of a scientific conference depends to a large extent on the presentation of the permanent record of that meeting. Too often, hastily edited notes which are hard to obtain, difficult to read and of doubtful reliability, are all that remains of the labors of many experts.

The presentation in book form of the more than one hundred papers given at the Glasgow Conference has been a real pleasure to anyone working in the field of nuclear physics. The editing by Drs. Bellamy and Moorhouse is of uniformly high quality.

The papers are divided into eight sections: Nuclear Forces and Nuclear Scattering, Nuclear Data and Nuclear Models, Photodisintegration, Beta- and Gamma-Ray Transitions, π -Mesons, Field Theory, High-Energy Experimental Technique, and Heavy Mesons and Hyperons. The sections are opened with a review paper by an outstanding expert in the field "so that physicists who are not specialists in that particular branch receive a comprehensive introduction to the reports of the latest researches which follow". The discussions following the papers have been included, and extensive references have been added throughout.

The diversity of the subject matter precludes a summary of the contents of this volume. The theory of Gell-Mann and Pais on heavy unstable particles—to mention only one of the more spectacular results presented here—is given for the first time in its complete form. More recent experimental findings have borne out this theory to a remarkable degree.

Electricity. By Eric de Ville. 159 pp. Penguin Books, Inc., Baltimore, Md., 1955. Paperbound \$65. *Reviewed by* J. R. Pierce, *Bell Telephone Laboratories.*

To readers who grow somewhat weary of popular books which profess to explain the most abstruse parts of modern physics, this small book will have welcome features. It explains in generally clear and simple terms and with the aid of clear line drawings, such truly intelligible matters as electrical instruments, bells, bridges, generators and motors, the telegraph and telephone, wireless, television and radar, and it has something to say about the atom and about electronic computers. In general, the emphasis is more on practical importance

and industrial use than in understanding the fundamental physical background of electricity. The book is illustrated with 20 admirable photographs of various historical and modern devices.

While the book is simple and clear, it is not entirely without fault. For one thing, the historical approach is used throughout, and this leads to the inclusion of certain matters, such as description of Daniell and Leclanché cells, which by this time we could perhaps ignore.

For another thing, while most of the statements of the book seem to be based on authorities of one sort or another, these authorities apparently range from old to modern and have not been fully reconciled. Thus, in the case of electric current, we read on page 27, "Exactly how the electric charges pass along the wire we do not yet know", while on page 89 we are told that "The electrons can be thought of as a cloud which is free to move independently of the atoms from which they come." On page 77, the myth that electron impact moved the paddles in a tube built by Crookes is perpetuated. On page 46 there is listed among the advantages of turbo-alternators over reciprocating engines, quietness, but not efficiency.

Thus the reader is not always completely safe as to details and the proper interpretation of the things which he finds in the book but, by and large, what he finds is at least intelligible and practically important. One could perhaps wish for a somewhat better digested and deeper book covering similar ground.

Beta- and Gamma-Ray Spectroscopy. Edited by Kai Siegbahn. 959 pp. (North-Holland Publishing Co., Netherlands) Interscience Publishers, Inc., New York, 1955. \$20.00. *Reviewed by* Bernard T. Feld, *Massachusetts Institute of Technology.*

The phenomenal development of low energy (classical) nuclear physics in the last decade has been such that even the experts cannot hope to maintain more than a superficial familiarity with all of its aspects. In this circumstance, it has become necessary to depend on authoritative surveys of the various branches of the field, appearing at reasonable (and constantly decreasing) intervals, to preserve the continuity and ease of intercourse so necessary to continued progress.

The volume here under review is the outstanding effort to date in this direction. It covers only a limited field—that of the investigation of nuclear energy levels by the study of the beta- and gamma-ray spectra of radioactive nuclei—but with a thoroughness and authority which will render it indispensable to workers in these and related fields for years to come. It is a book by experts for experts, but its scope is sufficiently broad so that it will be used, and frequently so, by practically all nuclear physicists.

It would be foolhardy for this reviewer, even if space allowed, to attempt a detailed summary of what is contained in the 959 pages—26 chapters made up of 42

articles, plus eight appendices, an author and a subject index, representing the contributions of 42 collaborators—of this monumental work. A brief survey of the contents, coupled with the exhortation that every nuclear physicist who has not already done so should set aside an afternoon in the library for a leisurely perusal of this book, will have to suffice.

Surveys of the interactions of electrons and photons with matter are followed by thorough discussions of the various techniques of beta- and gamma-ray spectroscopy. Then come chapters on the theory of beta decay and on the experimental results relating to the elucidation of the nature of the electron-neutrino field and its interaction with nucleons. Chapters on the theory of photon emission, internal conversion, and the shell model are followed by discussions of the results of β - and γ -ray spectra and isomers in elucidating the systematics of nuclear shell structure and the nature of the collective modes of nuclear motion. The rest of the volume contains contributions relating to various special techniques and applications—measurement of short lifetimes, angular correlations, etc., etc. The appendices contain indispensable tables of absorption coefficients, Fermi functions, forbidden shape factors, internal conversion coefficients, etc.

Inevitably, the contributions spill over into other aspects of nuclear spectroscopy, all however related in that an electron or γ -ray measurement is involved (α - γ correlations, charged particle reactions, neutron capture γ -rays). These indications of the interconnections between various aspects of nuclear physics serve to emphasize the great need for similar compilations covering the other phases of the field. It is to be hoped that such will follow soon, and that they will all maintain the lofty standard set by this work.

Theory of Ordinary Differential Equations. By Earl A. Coddington and Norman Levinson. 429 pp. McGraw-Hill Book Company, Inc., New York, 1955. \$8.50. Reviewed by T. Teichmann, Lockheed Aircraft Corporation.

This book provides the most complete and up-to-date treatment of the theory of ordinary differential equations presently available. Since the authors are both pure mathematicians the treatment is rigorous and does not make any concession to readers who are only interested in applying the results and who would be satisfied by heuristic arguments and vague hand waving in place of a proof. This is not to say, however, that the book will not prove useful to those interested in applications. The important results are all stated as theorems and corollaries, and while the treatment is quite formal, each chapter is prefaced with a section describing the central problem to be discussed, and the general methods of the text are complemented by a series of more specific problems at the end of each chapter, together with hints for their solution.

Among the topics treated are the existence and

uniqueness of solutions, linear differential equations with and without singularities, the asymptotic behavior of solutions both as a function of the independent variable, and of parameters of the equation, self-adjoint and non-self-adjoint boundary value problems, oscillation and comparison theorems, perturbation of periodic systems, and a topological discussion of two dimensional systems. There is also a list of the basic references for each chapter at the end of the book.

The sections on asymptotic expansions, non-self-adjoint boundary value problems, and on perturbation theory, in particular, will repay careful study, for this material is not readily available in other general works with the same degree of completeness. In fact, this volume, taken together with one of the standard books on special functions, will probably provide as much information as can reasonably be required as far as any applications are concerned, and will certainly give a thorough grounding for further mathematical research.

The Origin of the Earth (Second Edition). By W. M. Smart. 224 pp. Penguin Books, Inc., Baltimore, Md., 1955. Paperbound \$65. Reviewed by S. F. Singer, University of Maryland.

This little volume is done in a very readable and popular style but has a misleading title. It is really a popular exposition of astronomy and covers besides the earth also the solar system and the stars. Much of the book also deals with atomic structure and radioactivity. There are eight photographic plates of very good quality. This very fine book by the distinguished Glasgow astronomer should be well suited for additional reading in physics and astronomy courses.

Everyday Physics (Second Edition). By Ole A. Nelson and John G. Winans. 614 pp. Ginn and Company, Boston, Mass., 1955. \$4.36. Letter to the Editor from John G. Winans, University of Wisconsin.

In a review of the 1952 edition of this book published in the January 1954 issue of *Physics Today*, a number of errors were pointed out. Most of the errors have been corrected in the present 1955 edition. Correction sheets for remaining errors may be obtained by writing to the publisher.

Books Received

CLASSICAL ELECTRICITY AND MAGNETISM. By Wolfgang K. H. Panofsky and Melba Phillips. 400 pp. Addison-Wesley Publishing Co., Inc., Cambridge, Mass., 1955. \$8.50.

IMAGINATION'S OTHER PLACE. Poems of Science and Mathematics. Compiled by Helen Plotz. 200 pp. Thomas Y. Crowell Co., New York, 1955. \$3.50.

TRANSMISSION-LINE THEORY. By Ronold W. P. King. 509 pp. McGraw-Hill Book Co., Inc., New York, 1955. \$12.00.