Penman, Brown, Gross, Darnell, Perry, and others on this point is completely convincing to me, and if it is not to the author many readers would like to know why. Since we know nothing about the mechanism of nuclear activation, why would simultaneous but not interdependent activation of nucleolar and nucleoplasmic functions be so improbable?

I would recommend to readers a careful study of the phenomenology of the Sendai-virus-produced heterokaryon, as described in Harris's book. But I have also to add (especially for readers of tender age) that a clear view of the significance of much of this work will require independent knowledge of the literature, both cited and not cited.

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Particle Concepts

Elementary Particle Theory. A. D. MARTIN and T. D. SPEARMAN. North-Holland, Amsterdam, and Elsevier, New York, 1970. xvi, 528 pp., illus. $27.50.

It is impossible to write a book on elementary particle theory since, as the authors themselves emphasize at the very beginning of their preface, there is no such thing in existence. Nevertheless, a number of useful books have appeared in the last five years on this subject. The present volume is a fine addition to this list.

Although there is no elementary particle theory in existence, the amount of activity that has taken place in the field is staggering. In writing a book of finite length, therefore, some choices must be made. One such choice is whether the book should discuss theoretical constructs and ideas that have been generated in the field or should concentrate on summarizing how we have managed to classify, organize, and, after a fashion, "explain" the vast amount of experimental information that has been accumulated. The present volume opts heavily for the former, although occasional applications and phenomenological considerations are mentioned both in the text and in the problems.

Even within the body of theoretical ideas, some limitations have been imposed in this book. Almost all of the discussion deals with what we have deduced from the Lorentz group and from analyticity, and the group theory used in particle classification and the theories based on the generalized concept of current are omitted. This limitation is explicitly stated by the authors and should not be counted as a drawback.

Within the boundaries thus outlined, the book is a very valuable contribution. The text is easy to read and lucid, the derivations are not overly formalistic, and the thread of development is logical and continuous. Credits for discoveries are not always accurately assigned, but that is an unimportant aspect of a book. The volume is greatly enhanced in value by the numerous problems given at the end of each chapter, with hints and partial solutions at the end of the book. This is a rare and welcome feature among elementary particle textbooks.

Although one-sentence comparisons are somewhat superficial, it might be said that the present volume is more abstract and more detailed than the book by Frazer, more theoretically oriented than the text by Kallen, and more modern in outlook than Muirhead's tome. As compared to Gasiorowicz's book, the present volume is less oriented toward field theory and less comprehensive, but on the topics treated more complete. Finally, the present book is of course more up to date than any of the above-mentioned "competitors," simply because it was written a few years later.

All in all, the book will undoubtedly find many readers among advanced graduate students learning about particle physics, as well as among workers in the field who want to clarify some basic concepts outside their own special area.

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Element No. 92

The Chemistry of Uranium. Including Its Applications in Nuclear Technology. E. H. P. CORDFUNKE. Elsevier, New York, 1969. xiv, 250 pp., illus. $16.75.

Anyone who sets himself the task of writing a monograph on the chemistry of uranium assumes an enormous amount of work, for uranium has probably been the most intensely studied element in the periodic table over the last 20 to 25 years. Katz and Rabinovitch covered the work up to 1950 in a well-known monograph (*The Chemistry of Uranium*, McGraw-Hill, 1951), but, as the present author states in his preface, "Now the time seems ripe for a new book that gives a broad survey of the current chemistry and technology of uranium."

The importance of uranium in the generation of atomic energy is enough to make a good monograph on its chemistry important, and when the nuclear applications of the subject are included the potential value is even greater. When such a great amount of work is to be covered compromises must be made, and perhaps the nuclear and analytical chemist would feel somewhat slighted by Cordfunke's choices. For instance, neutron cross sections are hardly mentioned, and analysis by isotope dilution is not discussed; both of these topics are important in many phases of technology. Indeed, nuclear and analytical chemistry are covered only sketchily—but excellent compilations already exist on these specialized subjects.

This book brings together the enormous amount of recent work on uranium metal, alloys, oxides, and salts in a well-planned manner—a welcome change from the collection of papers presented by Katz and Rabinovitch. After giving an interesting history of the discovery of uranium, the author systematically treats each of these topics concisely but thoroughly. Extensive use is made of phase diagrams to convey a great amount of information in a minimum of space. Thermodynamics, crystalline form, and interatomic distances are extensively covered, and this coverage alone makes the book quite valuable. The author's extensive work on uranium oxide systems is evident in his treatment of this important topic. Uranium salts, hydrates, aqueous ionic properties, and metallurgical aspects of uranium metal and alloys are also featured.

The synthesis of chalcogenides (compounds with sulfur, selenium, and tellurium) of uranium is a relatively recent development which is well summarized and brought up to date. Technological applications are emphasized throughout the text and also are the subject of a special chapter. A rather unusual feature of the book is that at the bottom of each page of text it gives the numbers of the pages (ends of chap-

ters) on which full references are listed. This is a useful feature in a monograph which naturally contains many references.

Cordfunke has accomplished a needed updating, critical review, and drawing together of the present state of uranium chemistry and its application to technology. A thorough review of the literature (especially European) has provided numerous references for more detailed study. This book provides in concentrated form a wealth of up-to-date information for those pure or applied scientists who are interested in an element that will no doubt have a great impact on the future of mankind. An authoritative addition has been made to the reference library of the uranium chemist.

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New Reviews

Advances in Human Genetics. Vol. 1. HENRY HARRIS and KURT HIRSCHHORN, Eds. Plenum, New York, 1970. xii, 340 pp., illus. $19.50.

Reviews undoubtedly are most useful in those fields to which multiple and diverse disciplines contribute, and particularly in those fields which are on a logarithmic growth curve. Certainly human genetics satisfies this description, and fortunately there has been no shortage of collected reviews. The following are a few of those in the English language: L. S. Penrose and H. L. Brown, Eds., *Recent Advances in Human Genetics* (1961); *British Medical Bulletin* (1961, 1969); A. G. Steinberg and A. G. Bearn, Eds., *Progress in Medical Genetics* (1961, 1962, 1964, 1965, 1967, 1970); A. E. H. Emery, Ed., *Modern Trends in Human Genetics* (1970).

The newest comer to the field of collected reviews contains five contributions in its first volume. John H. Edwards gives a highly complex discussion of the analysis of pedigree data; Orlando J. Miller reviews autoradiography in human cytogenetics; Hugh Fudenberg and Noel L. Warner discuss the genetics of immunoglobulins in mouse, rabbit, and man; Charles R. Scriver and Peter Hechtman review the genetics of membrane transport in man; and Jean Frézal and Jean Rey give a review of the genetics of disorders of intestinal digestion and absorption. Thus the major areas of human genetics—biochemical genetics, cytogenetics, immunogenetics, statistical and population genetics, clinical genetics—are all represented. The contributors were well selected and they have lived up to their reputations. It is hoped that the high quality of this initial volume will be maintained in future ones.

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Public Health Monograph

Syphilis and Other Venereal Diseases. WILLIAM J. BROWN, JAMES F. DONOHUE, NORMAN W. AXNICK, JOSEPH H. BLOUNT, NEAL H. EWEN, and OSCAR G. JONES. Harvard University Press, Cambridge, Mass., 1970. xxii, 242 pp., illus. $6. American Public Health Association Vital and Health Statistics Monographs.

This volume begins with an excellent account of the history of syphilis and the evolution of modern treatment, summarizing many of the longer discussions of the subject. There are chapters on the diagnosis and treatment of syphilis, gonorrhea, and the minor venereal diseases, apparently intended as background material for nonphysician readers. This portion of the book contains a section dealing with relapse in syphilis which might be questioned by modern syphilologists. A chapter on casefinding control measures outlines the development of the methods now in use in the United States. There is an excellent chapter on venereal disease in the military, a subject not often discussed in such treatises. A major portion of the book is devoted to morbidity and mortality. The work of Boeck and Bruusgaard is reviewed in detail. Syphilis mortality in both the congenital and late stages is discussed. The findings are broken down according to age, sex, and geographic distribution. This discussion is documented by approximately 50 pages of statistics on morbidity and mortality in the United States between 1941 and 1966.

This book should be of value to health officers, venereal disease control officers, social workers, and paramedical personnel in all branches of health control.

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Books Received

Advances in Cancer Research. Vol. 13. George Klein, Sidney Weinhouse, and Alexander Haddow, Eds. Academic Press, New York, 1970. xiv, 440 pp., illus. $22.

Advances in Enzymology and Related Areas of Molecular Biology. Vol. 33. F. F. Nord, Ed. Interscience (Wiley), New York, 1970. viii, 596 pp., illus. $21.50.

Advances in Heat Transfer. Vol. 6. James P. Hartnett and Thomas F. Irvine, Jr., Eds. Academic Press, New York, 1970. xii, 578 pp., illus. $26.

Advances in Hydroscience. Vol. 6. Ven Te Chow. Academic Press, New York, 1970. xvi, 260 pp., illus. $16.

Advances in Lipid Research. Vol. 8. Rodolfo Paoletti and David Kritchevsky, Eds. Academic Press, New York, 1970. xviii, 470 pp., illus. $23.

Advances in Machine Tool Design and Research. Proceedings of a conference, Manchester, England, September 1969. S. A. Tobias and F. Koenigsberger, Eds. Pergamon, New York, 1970. viii, 736 pp., illus. $50.

Advances in Metabolic Disorders. Vol. 4. Rachmiel Levine and Rolf Luft, Eds. Academic Press, New York, 1970. xvi, 364 pp., illus. $18.

Advances in Quantum Chemistry. Vol. 5. Per-Olov Löwdin. Academic Press, New York, 1970. xvi, 304 pp., illus. $17.

Die amerikanische Wissenschaftslobby. Zum sozialen und politischen Wandel des Wissenschaftssystems im Prozess der Forschungsplanung. Peter Weingart. Bertelsmann Universitätsverlag, Düsseldorf, 1970. 256 pp., illus. DM 28. Wissenschaftstheorie, Wissenschaftspolitik, Wissenschaftsgeschichte, Band 13.

Analytical Chemistry of Zirconium and Hafnium. Anil K. Mukherji. Pergamon, New York, 1970. xiv, 282 pp., illus. $12. International Series of Monographs in Analytical Chemistry, vol. 40.

Animal Behavior. V. G. Dethier and Eliot Stellar. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1970. viii, 152 pp., illus. Cloth, $6.95; paper, $3.25. Foundations of Modern Biology Series.

Annual Reports in Medicinal Chemistry, 1969. Cornelius K. Cain, Scott Childress, Barry Bloom, Koert Gerzon, Irwin Pachter, Charles Smith, and Joseph Cannon, Eds. Academic Press, New York, 1970. xxiv, 378 pp. Paper, $9.

Annual Review of Astronomy and Astrophysics. Vol. 8. Leo Goldberg, David Layzer, and John G. Phillips, Eds. Annual Reviews, Palo Alto, Calif., 1970. x, 496 pp., illus. $10.

Applications of Decision Tables. A Reader. Herman McDaniel, Ed. Brandon/Systems, Princeton, N.J., 1970. x, 226 pp., illus. $9.95.

Applications of Nuclear Physics. J. H. Fremlin. Hart, New York, 1970. xiv, 364 pp., illus. $15.

An Approach to Physical Science. Supplementary Chapters. PSNS Project Staff. Wiley, New York, 1970. x, 166 pp., illus. Paper, $3.95.

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