Book Reviews

Atlas of Exfoliative Cytology. George N. Papanicolaou. Harvard Univ. Press, Cambridge, Mass., 1954 (for the Commonwealth Fund). 9 chapters + bibliography + index. Plates. $18.

Papanicolaou's atlas, dealing primarily with cancer diagnosis in exfoliated cells, is an outgrowth of his pioneer studies on the reproductive physiology of mammals by means of his well-known vaginal-smear technique. As a result of many years of arduous study, it has been possible to determine the presence of malignancy in certain body organs by examination of their exfoliated cells. However, much of this information is to be found only in isolated publications. Accordingly, Papanicolaou realized the urgent need for an atlas that would bring together in both a descriptive and a pictorial manner all the pertinent information relative to the subject of exfoliative cytology, particularly as it relates to the study of cancer.

The text is relatively brief. It is clearly and concisely written and seems to include the essential available descriptive morphologic information for the identity of both normal and malignant cells. Frequent reference is made to the meticulously executed color plates of both normal and pathologic cells, which were made under the supervision of the author. Of the 36 plates, 24 are drawings and 12 are photomicrographs.

In addition to chapters on the collection and staining of exfoliated cells in smears and washings and on the diagnostic characteristics of both normal and malignant cells, the work includes chapters and plates on the following: female genital system, urinary and male genital systems, respiratory system, digestive system, pleural and peritoneal exudates, and the breast. Other miscellaneous plates are of histiocytic cells, cells related to pregnancy, cells affected by radiation, and multinucleated cells and mitotic figures of both normal and malignant cells. In addition to the references made to the plates, the author has provided descriptive information in the form of legends as well as a page or more of discussion directly related to the specific cells illustrated.

The manual's durably bound seven-ring loose-leaf format is attractive if rather bulky. In adopting this form of binding, Papanicolaou hopes that the atlas may be kept up-to-date by the addition of new material as it becomes available. No one knows better than he that, at present, our knowledge of exfoliative cytology is limited, but he nurtures the hope that someday this new branch of cytology may emerge as an independent morphologic science.

It seems appropriate to mention here that in a recent symposium on the "Value of exfoliative cytology in the diagnosis of cancer," and in various other papers by experts in this field [*Am. J. Clin. Pathol.* 24 No. 6 (1954)], credit has been given to Papanicolaou as the leader in the development of this area of study. It was further stated that exfoliative cytology has proved a valuable routine screening technique for the diagnosis of certain types of cancer. In addition, the need for more trained pathologists and technicians in this field was emphasized. Accordingly, no more significant or opportune contribution could have been made to this subject than this atlas, which will serve as an essential guide, not only for the training of students, but also for the diagnostician and researcher as well.

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Physical Meteorology. John C. Johnson. Technology Press, M.I.T., Cambridge; Wiley, New York; Chapman & Hall, London, 1954. xii + 393 pp. Illus. $7.50.

In recent years meteorologists have realized that substantial progress in solving problems of synoptic weather analysis must come from further knowledge of the fundamental physics of the atmosphere. Research in government and university laboratories has emphasized this approach, and from such endeavors useful results have been and are forthcoming. This book assembles in brief readable form a summary of much of our present knowledge of the physics of the atmosphere.

Beginning with refraction of electromagnetic energy through the atmosphere, the first chapter discusses terrestrial and astronomical refraction, mirages, and radio ducts. This is followed by a discussion of scattering phenomena, polarization, visibility determinations, and visual range. Chapters 4 and 5 cover radiation processes of the atmosphere. The fundamentals and measurement of solar radiation, long-wave radiation, radiation transfer in the atmosphere, heat budget of the earth, eddy diffusion of heat, and heat transfer in the soil are included. The use of atmospheric radiation charts, and the Elsasser chart in particular, are described in detail. A working copy of the Elsasser chart is folded into a pocket inside the back cover. Chapter 6 describes the theory of major optical phenomena in the atmosphere. This chapter might better have followed the material on scattering and visibility.

The chapters on the physics of cloud and precipitation formation present the classical theories, the limitations thereof, and the recent contributions of Houghton and Bowen. The section on cloud-seeding is brief and to the point, discussing only the mechanisms that have been investigated. Recent advances in radar meteorology for study of atmospheric moisture content and distribution are included. The fundamentals of the earth's electric field, thunderstorm electricity, lightning, and sferics are described in Chapter 9. The concluding chapters cover the ionosphere, ozonosphere, and physical properties of the upper atmosphere. Based on recent upper air research, the author has incorporated methods of measurement and data

on temperature, density, pressure, and humidity to 100 km.

This is intended as a textbook for undergraduate courses in physical meteorology. For this purpose it should succeed. The material is well organized in spite of the wide diversity of topics it covers and is written in a readable manner. Following each chapter adequate references and source books are listed as well as several thought-provoking problems. The many figures deserve a special note of praise for their simplicity, originality, and unusual clarity. A list of symbols and an index are included.

Johnson has presented in condensed form the fundamentals of a wide range of subjects bordering on meteorology. The book is highly recommended, not only as a textbook, but also as a useful reference for the professional meteorologist.

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Introduction to Chemistry. R. T. Sanderson. Wiley, New York; Chapman & Hall, London, 1954. 542 pp. Illus. $5.50.

This book may find a clientele among those who gained their science in earlier years and would like a readable book with a minimum of mathematics and detailed material, to bring them up to the current concepts of atomic, nuclear, and molecular structure, ionic effects, and other basic concepts of chemistry. In addition to the suggested use as a self-review for those who have been through the elementary chemical education process, this book can obviously serve as a guide for an elementary course, provided that suitable lectures and experiments accompany it so as to provide an adequate background for comprehension.

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Organic Coating Technology. vol. I. Oils, resins, varnishes, and polymers. Henry Fleming Payne. Wiley, New York; Chapman & Hall, London. 1954. 674 pp. Illus. $10.

The subject material in this book and in volume II, which is in preparation, is the chemistry, manufacture, and practical application of modern commercial coating materials. Volume I deals with fundamentals of film formation, plasticizers, test methods, and the basic chemistry and general use of coating materials such as vegetable and marine oils, varnish resins, alkyds, ureas, melamines, rubbers, cellulosics, vinyls, acrylates, and silicones.

Payne's lucid discussion, which is on a theoretical basis, provides a solid foundation for students and technicians to delve deeper into their various fields. Reference is made in each topic to commercially available coating materials and suggested formulations. This type of information, which is a proper combination of the theoretical with the practical, is of great assistance to the technician who often is forced to work rather blindly with commercial coating materials of undisclosed chemical composition. Credit must be given to the manufacturers who have made it possible for the author to gain this clear understanding of the nature of their products. In a book of this scope, there naturally are unavoidable omissions under the various subjects discussed, but on the whole the necessary fundamental information is presented clearly and concisely.

In the preface, the author states that this book, together with volume II, is intended for students in paint courses and for new employees in the oil, pigment, and paint industries. In my opinion, this book, because of its broad theoretical and practical scope, is worth careful reading also by the experienced technician. Payne has written on this difficult and highly ramified subject with the skill and understanding of a highly successful teacher, which he has been for a considerable number of years at the Polytechnic Institute of Brooklyn.

It is hoped that the high standard and interesting presentation of this book will be continued in volume II.

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Chromium. A. H. Sully. Academic Press, New York; Butterworths, London, 1954. xii + 272 pp. Illus. $5.50.

Zirconium. G. L. Miller. Academic Press, New York; Butterworths, London, 1954. xviii + 382 pp. Illus. $7.50.

These two books are the first of a series on the metallurgy of the rarer metals. Future editions are planned for titanium, molybdenum, platinum and the metals allied with it, manganese and uranium.

The first of these, *Chromium,* describes the ores, production of ferro-alloys and pure chromium, physical properties, fabrication and mechanical properties, electroplating, chromizing, and the constitution and properties of chromium alloys. The chapters on physical and mechanical properties deal extensively with some of the problems associated with the development of room-temperature ductility in chromium—that is, impurity content and nature of applied stresses. The discussions of electroplating and chromizing are very complete with respect to both theory and practice. The last chapter, which deals with the constitution and properties of chromium alloys, is one of the best summaries of this subject that has appeared.

The second book, *Zirconium,* is a fairly complete collection of the latest information on this metal. The first three chapters describe the history, occurrence, consumption, use, and extraction from ores. The fourth chapter, dealing with the separation of hafnium and zirconium, is of special interest by virtue of