show. Scientific advances are certainly one of the causes of present socioeconomic problems in medicine; without the scientific advances of the past century and a half, the problems of medicine today would be different. Medical science, however, is international. Diphtheria and our knowledge of it are the same here as elsewhere in the world, or would be were it not for varying socioeconomic conditions, both of medicine and of the public generally. If current problems were simply the result of the development of medical science, they would be the same throughout the world. Manifestly they are not. The problems of medicine in America today, Wood states, are largely social. Social medical problems have social as well as scientific causes, and in this book social causes are not explored historically. In his analysis of present problems, Wood does not delve into the social, economic, institutional, or political background of why medical education and medical practice are organized in this country as they are. There is no comparative analysis of the social organization of medicine in the United States and, say, Denmark, where, as Wood notes, life expectancy is higher and doctors are fewer. No one can deny the effect of advances in medical science. But by failing to analyze or to illustrate historically the social background, Wood has given us a one-sided and meager "historical perspective."

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Immunologic Phenomena

Introduction to Immunochemical Specificity. William C. Boyd. Interscience, New York, 1962. viii + 158 pp. Illus. $8.

As a short, informal, and authoritative account of the development of immunochemical theory, William Boyd's new book deserves attention, particularly by students and teachers. The subject matter was initially presented in 1959 as a series of lectures in Moscow. In his preface, Boyd states that the published form contains many additions and revisions, although much of the "lecture" style persists. Once recognized, the style need not present serious disadvantages. Indeed, the freewheeling informality, along with a generous offering of tables and illustrations, makes for good reading as well as for clarity and precision.

The first three of the book's ten chapters are devoted to theory and definitions. The points discussed are well illustrated by the classic experiments of Landsteiner, Goebel, Kabat, and others, including the author's own contributions.

A general introduction to the human blood groups provides the background for much of the remainder of the book. Naturally occurring, red-cell agglutinins (lectins) from plants have been one of Boyd's main interests. Two chapters deal with this fascinating though somewhat specialized subject. While such substances have proven most valuable to serologists for typing individuals for red cell antigens and to immunochemists in their investigation of the chemical nature of the antigenic determinant groups, no one has come up with a convincing notion of the role of the lectins in the plant. It seems certain that their specificity for blood group antigens is an accident of nature, but Boyd holds that their ability to combine with certain carbohydrate structures is vital to the life processes of the plants themselves.

The chemistry of the blood group antigens and the genetic control of the specific antigenic sites have certainly provided a fertile field for the investigation of immunochemical specificity. The works of Morgan and his coworkers and of Kabat and his collaborators stand out as landmarks of creative research in this field, and Boyd's treatment of the subject is well illustrated and clear. Chemists specializing in carbohydrates will find this discussion most interesting.

There is only cursory treatment of protein antigens in Boyd's book. This omission is perhaps understandable, since there have been relatively few successful attempts to identify the chemical nature of the antigenic determinants of native proteins. Cebra's experiments with silk fibroin are mentioned, and Landsteiner's classic work with amino acid and peptide haptens on conjugated antigens are discussed in some detail.

As soon as it became apparent that antigens and specific antibodies combine in a firm chemical union, physical chemists and immunochemists proceeded to determine the physical constants of the reaction in order to establish the nature of the chemical bonds. Recently many elegant approaches have been devised. There is an impressive agreement among investigators as to the order of magnitude of the thermodynamic values for immunochemical reactions. Boyd presents some of the highlights of these efforts along with an elementary discussion of thermodynamics principles as they are applied by the immunochemist.

Although the specialist should be attracted to this book for the organization of the material and for some of the more recent details, the book is directed primarily toward those who wish to have an introduction to immunochemistry. For this purpose it is highly recommended.

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Molecular Biology

Polyelectrolyte Solutions. A theoretical introduction. Stuart A. Rice and Mitsuru Nagasawa. Academic Press, New York, 1961. xv + 568 pp. $16.50.

In this period when physics, chemistry, and the life sciences are becoming increasingly intertwined, the appearance of a book on a combination of research fields is a welcome one. In this particular case, the authors have produced a volume that will be definitive for many years to come.

All phases of the theory of polyelectrolyte solutions, at least in the Debye-Hückel approximation, are covered. In addition to providing a comprehensive account of the results of the theory, the authors very clearly discuss the approximations that are customary in polyelectrolyte theory and point out the places at which they are likely to be inadequate to the problems treated. Some of the topics covered are the equilibrium properties of dilute electrolyte solutions, including a rather extensive account of the Poisson-Boltzmann equation, its solutions and the limitations of approximate solutions, the equilibrium properties of solutions of rigid polyelectrolytes, configurational problems relating to the structure of chain polyelectrolytes, the electrostatic free energy of polyelectrolytes, and many other aspects of the theory. Recent statistical mechanical attempts to derive corrections to the Debye-Hückel theory are not mentioned, but at the present time this is not too much of a

loss, because the corrections have not been subjected to experimental validation.

If there is any criticism to be made of this book it is that, in many places, the reading is heavy. For this reason, the book may not be suitable for a first-year graduate course unless the students have had extensive preliminary study of thermodynamics and statistical mechanics.

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Practical Science

A Short History of Clinical Pathology. W. D. Foster. Livingstone, London; Williams and Wilkins, Baltimore, Md., 1961. xii + 154 pp. Plates. $6.50.

Clinical pathology is the application of certain basic techniques of medical science to the diagnosis and treatment of disease. Since such procedures only become available as sciences develop, the text deals with progress in the related sciences; this attractively-bound, well-illustrated book is, therefore, an account of scientific advances in microscopic anatomy, physiology, pathology, microbiology, serology, and chemistry—the disciplines upon which clinical pathology rests and also the ones which have made possible its development. From crude visual inspection of a urine specimen to modern urinalysis is a great step forward, one that contributes immensely to medical diagnosis and treatment. Clinicians once resisted the introduction of laboratories into practice. That laboratories are now a must in practice and in hospital care is a measure of our progress. The clinical pathologist is, if medically qualified, a full member of the clinical team.

The book is unique in that it deals with the development of a science which is itself half a dozen sciences. Because its author is British, the book is slanted to British history and problems, but it deals fairly with advances made elsewhere. It is well written and throws light on our basic medical sciences from a point of view rarely exploited, making it valuable reading for scientists who are not practicing clinical pathologists as well as for those who are.

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New Books

Biological and Medical Sciences

Advances in Pharmacology. vol. 1. Silvio Garattini and Parkhurst A. Shore, Eds., Academic Press, New York, 1962. 485 pp. $13.

Advances in Small Animal Practice. vol. 3. Proceedings of the British Small Animal Veterinary Association, 1961. Bruce V. Jones, Ed. Pergamon, New York, 1962. 208 pp. Plates. $10.

Animal Agents and Vectors of Human Disease. Ernest Carroll Faust, Paul Chester Beaver, Rodney Clifton Jung. Lea and Febiger, Philadelphia, ed. 2, 1962. 485 pp. Illus. $9.50.

Animal Tissue Techniques. Gretchen L. Humason. Freeman, San Francisco, Calif., 1962. 473 pp. Illus. $8.

Annual Review of Pharmacology. vol. 2. Windsor C. Cutting, Ed. Annual Reviews, Palo Alto, Calif., 1962. 484 pp. Illus. $7.

Anxiety. A condition of modern man. Heiri Steiner and Jean Gebser. Dell, New York, 1962. 120 pp. Illus. Paper, $0.95.

Atoll Environment and Ecology. Herold J. Wiens. Yale Univ. Press, New Haven, Conn., 1962. 554 pp. Illus. Plates. $15.

Basic Facts of Medical Microbiology. Stewart M. Brooks. Saunders, Philadelphia, ed. 2, 1962. 335 pp. Illus. $5.

Biochemical Applications of Gas Chromatography. H. P. Burchfield and Eleanor E. Storrs. Academic Press, New York, 1962. 698 pp. Illus. $22.

The Biochemistry of Intracellular Parasitism. James W. Moulder. Univ. of Chicago Press, Chicago, Ill., 1962. 187 pp. $6.

Biophysical Science. Eugene Ackerman. Prentice-Hall, Englewood Cliffs, N.J., 1962. 640 pp. Illus. Trade ed., $13.35; text ed., $10.

Calciphylaxis. Hans Selye. Univ. of Chicago Press, Chicago, Ill., 1962. 573 pp. Illus. $25.

Carbohydrates of Living Tissues. M. Stacey and S. A. Barker. Van Nostrand, Princeton, N.J., 1962. 232 pp. Illus. $7.50.

Cellular Physiology and Biochemistry. William D. McElroy. Prentice-Hall, Englewood Cliffs, N.J., 1961. 127 pp. Illus.

Cilia, Ciliated Epithelium and Ciliary Activity. vol. 15, International Series of Monographs on Pure and Applied Biology: Modern Trends in Physiological Sciences. Jose A. Rivera. Pergamon, New York, 1962. 178 pp. Illus. Plates. $9.50.

Crop Adaptation and Distribution. Carroll P. Wilsie. Freeman, San Francisco, Calif., 1962. 456 pp. Illus. $9.

Czechoslovakian Medical Literature, 1959. Compiled by the National Medical Library, Prague. State Health Publishing House, Prague, Czechoslovakia, 1961. 284 pp. Paper.

Dictionary of Ecology. Herbert C. Hanson. Philosophical Library, New York, 1962. 382 pp. $10.

Elements of Biophysics. James E. Randall. Year Book Medical Publishers, Chicago, Ill., ed. 2, 1962. 339 pp. Illus. $8.75.

Étude des Antigènes de Transplantation. Présents dans les Cellules Spléniques et Thymiques. André Castermans. Arscia, Brusselles, Belgium; Maloine, Paris, 1962. 275 pp. Illus.

Experimental Embryology. Techniques and procedures. Roberts Rugh. Burgess, Minneapolis, Minn., ed. 3, 1962. 510 pp. Illus. $9.25.

Field and Laboratory Guide for Ecology. Paul C. Lemon. Burgess, Minneapolis, Minn., 1962. 186 pp. Illus. $5.

Genetics. Robert C. King. Oxford Univ. Press, New York, 1962. 363 pp. Illus. $7.50.

The Ideas of Biology. John Tyler Bonner. Harper, New York, 1962. 191 pp. Illus. $4.95.

Information and Communication in Biological Science. Lowell H. Hattery (Prepared for the Biological Sciences Communication Project, American Institute of Biological Sciences). Center for Technology and Administration, American University, Washington, D.C., 1961. 99 pp. Paper $0.25.

Integrated Basic Science. Stewart M. Brooks. Mosby, St. Louis, Mo., 1962. 507 pp. Illus. $7.85.

International Review of Cytology. vol. 12. G. H. Bourne and J. F. Danielli, Eds. Academic Press, New York, 1961. 433 pp. Illus. $15.

Laboratory Instructions in Biochemistry. Israel S. Kleiner and Louis B. Dotti. Mosby, St. Louis, Mo., ed. 6, 1962. 202 pp. Illus. Paper, $3.95.

Laboratory Outline for General Zoology. George Edwin Potter, Mosby, St. Louis, Mo., ed. 5, 1962. 356 pp. Illus. Paper, $4.

Microbial Classification. 12th symposium of the Society for General Microbiology, Royal Institution, London, 1962. G. C. Ainsworth and P. H. A. Sneath, Eds. Cambridge Univ. Press, New York, 1962. 492 pp. Illus. $9.50.

The Nature of Parasitism. The relationship of some Metazoan parasites to their hosts. W. P. Rogers. Academic Press, New York, 1962. 296 pp. Illus. $7.50.

The Photosynthesis of Carbon Compounds. Melvin Calvin and J. A. Bassham. Benjamin, New York, 1962. 139 pp. Illus. $5.50.

Plants. A photographic study. Addison E. Lee and Charles Heimsch. Holt, Rinehart, and Winston, New York, 1962. 68 pp. Illus. Paper, $1.50.

Progress in Hematology. vol. 3. Leandro M. Tocantins, Ed. Grune and Stratton, New York, 1962. 383 pp. Illus. $16.50.

Regional Silviculture of the United States. John W. Barrett, Ed. Ronald, New York, 1962. 617 pp. Illus. $12.

Response of the Nervous System to Ionizing Radiation. Proceedings of an international symposium held at Northwestern University Medical School, Chicago, Ill., September 1960. Thomas J. Haley and Ray S. Snider, Eds. Academic Press, New York, 1962. 800 pp. Illus. $18.

Selected Experiments in Medical Microbiology. Stewart M. Brooks. Saunders, Philadelphia, ed. 2, 1962. 103 pp. Illus. Paper, $2. Laboratory Manual for *Basic Facts of Medical Microbiology.*

Tissue Transplantation. Proceedings of an international syposium held at Santiago, Vina del Mar, and Valparaiso, Chile, 1961. Alberto P. Cristoffanini and Gustavo Hoecker, Eds. Univ. of Chile, Santiago, Chile, 1962. 269 pp. Illus. Plates.