

Rutherford of Nelson

The Collected Papers of Lord Rutherford of Nelson. vol 1, *New Zealand, Cambridge, Montreal.* Published under the direction of Sir James Chadwick. Interscience (Wiley), New York, 1962. 931 pp. Illus. \$19.50.

In recent years the increasing importance of science in modern life has stimulated interest in its history. There are many signs of this development, which seems to me a very desirable one because it is one way of helping bridge the gap between sciences and humanities about which we hear so much.

In this context there is hardly a more worthy enterprise than publishing the collected papers of great scientists. That there is a sincere desire for such collections is shown by the several which have recently appeared. To stay in the nuclear field only, we have the collected papers of Pierre and Marie Curie, of Frédéric and Irène Joliot-Curie, of Enrico Fermi, and now of Rutherford. The development of nuclear physics in all its intellectual vigor, spirit of adventure, and drama, can be traced through these writings.

Rutherford, so far the greatest experimental physicist of the 20th century, left a large number of writings, often in fairly inaccessible places. They will now be collected into four volumes, of which we have here the first covering the period from 1894 to 1906, inclusive—that is, from New Zealand to Montreal. The second will cover the Manchester period, 1907 to 1919; the third, the Cavendish period, 1919 to 1937; and the fourth will contain miscellaneous items. Director of the enterprise is Sir James Chadwick, one of the greatest pupils of Rutherford and very closely associated with him for many years.

Any student of physics—old, and thus able to remember the heroic times of the early development of nuclear physics, or middle-aged, and thus able to remember the decades from 1930 to 1950, the age of the neutron, or young, for whom all the content of Rutherford's papers is the reflection of a seemingly remote past—will enjoy, perhaps for different reasons, the volumes of the collected papers.

The supplementary historical material furnished in the introductions, written by some of Rutherford's scientific pupils, collaborators, or friends:

Sir E. V. Appleton, Professor H. L. Bronson, and Professor Otto Hahn, adds considerably to the historical information. The living testimonial of spectators of or actors in the drama recaptures some of the spirit of the times and the laboratories in which Rutherford operated.

The typographical presentation is worthy of the contents of the volume. We could hardly give it a higher praise.

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Mucosubstances

Carbohydrates of Living Tissues. M. Stacey and S. A. Barker. Van Nostrand, New York, 1962. xvii + 215 pp. Illus. \$7.50.

The authors of this book are head and lecturer, respectively, in the department of chemistry at the University of Birmingham (England). According to the publisher, the book "is intended for the medical profession, research chemists, and biochemists. In particular, it will help the pathologist to gain an insight into chemical changes that take place in living tissues during diseases, and it will be a valuable textbook for the chemical student."

The book contains an introduction and nine chapters entitled "Glycogen," "Hyaluronic acid," "Chondroitin and chondroitin sulfates A, B, and C," "Heparin and heparitin sulfate," "Miscellaneous polysaccharides," "Milk oligosaccharides," "Blood group polysaccharides," "Mucoproteins in health and disease," and "Lipocarbohydrates." According to the introduction, it is concerned with those carbohydrates that occur in some polymeric union with other large molecules rather than with the "wonderful series of sugars and sugar phosphates constituting one of the body's chain of reactions." How the milk oligosaccharides fit this program remains unexplained, except that they presumably are wonderful. Approximately three-quarters of the material deals with substances containing hexosamine, a field in which the authors have had some personal experience. The book is at its best in the discussion of the structural analysis of the mucopolysaccharides and at its weakest in dealing with biological problems, including the histology of normal tissues and the

discussion of disease states. In general, the book is written with greater care than its predecessor, *Polysaccharides of Microorganisms*, and it covers an area of biochemistry in which no book of similar scope exists today.

The following is a list of some of the errors or questionable statements: (i) at the top of page 50, the treatment with limewater refers to the normal tetrasaccharide and *not* to that produced by leech hyaluronidase; (ii) at the top of page 53, the incorporation of C¹⁴ by extracts of Rous sarcoma was very small and yielded a dialyzable product which the authors believed to be related to hyaluronic acid; (iii) on page 66, first footnote, "ligamentum nuchae connects the apices of the spines from the seventh cervical vertebra to the sacrum." The ligamentum nuchae, a structure most developed in grazing animals, connects the cervical vertebrae to the length of the external occipital crest; (iv) the second footnote of page 66 states that "the aorta joins the left ventricle to the abdominal cavity"; (v) on page 42, the most widely used staining methods for acid polysaccharides and especially for the demonstration of hyaluronic acid, the staining with colloidal iron and with Alcian blue, are not mentioned.

The bibliography is quite extensive, and the book, in general, should prove to be of some value to those unfamiliar with a field of ever-increasing importance and complexity. There is very little in the book that conveys to the reader a feeling for the adventure and the problems inherent in this still unfolding field.

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Pharmaceutical Essays

Readings in Pharmacy. Paul A. Doyle. Interscience (Wiley), New York, 1962. xiv + 429 pp. \$6.95.

This anthology consists of eight sections, about equal in length (from 45 to 70 pages), each containing five to ten essays. The sections are entitled: "Prolegomena to pharmacy" (more accurately, a miscellany), "History of pharmacy," "Some famous names in pharmacy," "Pharmacy around the world," "Drugs versus disease," "Pharmaceuti-

cal education," "Problems in pharmacy," and "Pharmacy in literature and music." Each section begins with a student-oriented introduction (about two pages) and ends with some 40 to 80 citations of additional readings. A majority of the essays are by 20th century writers within Anglo-American pharmacy, with the main stress on the pharmaceutical profession (rather than on pharmaceutical science or the manufacturing industry).

The essays are well selected, judged within the editor's stated purpose of "inculcating proper ideals and necessary background of pharmacy" through a textbook of essays chosen for "interest, significance, appropriateness for an undergraduate audience, and understandability." To stay within this concept, it was necessary to omit "many worthwhile essays . . . because they were too technical and, hence, would be beyond the understanding of first-, second-, or third-year students" of pharmacy. Adherence to brevity and to the English language (without any translations) further narrowed the editor's range of choice.

The essays are responsibly written, but show the wide gamut of divergent styles and disparate topics characteristic of anthologies: For example, companion essays in the section on drugs are a semifictional account of the discovery of morphine and an essay on antibiotics by a Nobel Prize winner.

These essays are the seasoned survivors of some years of classroom experience with a wide range of assigned readings of the type here selected. The editor quite properly and usefully offers them to help ameliorate the fact that "course work directed specifically toward the development of professional enthusiasms, pride, and idealism has not been as universal, as generally well thought out, or as emphatic" as it could be.

For use in professional orientation courses, the present volume undoubtedly will be most effective when used for assigned supplementary readings in conjunction with a systematic textbook. Even seasoned pharmaceutical workers will enjoy taking up *Readings in Pharmacy*, whether to browse or buy; and every library with a pharmacy collection should find it worthwhile. The book is well printed, well bound, and briefly indexed.

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Classical Zoology

Introductory Zoology. Lincoln Coles Pettit. Mosby, St. Louis, Mo., 1962. 619 pp. Illus. \$7.50.

The onrush of modern biology has somehow left the descriptive, morphological aspects of that science far out in backfield. Genetics, physiology, cytology, ecology, experimental embryology, biochemistry, virology, bacteriology, and the like have, with their unending triumphs, long outshone the terrain, and, as they basked in their glories, these fields have made students feel apologetic for even taking an interest in such a drab subject as general zoology, although its subject matter was admitted to be of some value.

Pettit has, therefore, performed a signal service to biology by producing this text, which does an outstanding job of enlivening and modernizing a half-neglected, classical subject. In addition to rendering even the straight classificatory sections most readable, the author uses examples that are of immediate application in thought and teaching; he also adds much interesting, up-to-date, and diverse information, wherever it is relevant, by interweaving his accounts with the latest findings in genetics, ecology, animal behavior, medicine, and other lines of knowledge, all of which enrich the material immensely. These attributes not only redeem general zoology from the threat of desuetude, but they also turn the entire field into a vital and absorbing subject. The work, which is dedicated to Libbie Hyman, employs some of her suggestions in the reclassification of many invertebrate phyla.

The book is truly a text in introductory zoology which is wide in scope and rich in contents, one which scans the entire field and lays a solid background for every aspect of it. More than a third of the material is given over to human anatomy, general physiology, heredity, population, ecology, and evolution, all of which are excellently and interestingly handled down to the very latest modern detail, and are logically related to the story as a whole.

The final section, "Zoology and human destiny," is a fascinating survey with an original construction of the story of the origin of man and of his racial ramifications. This section also contains penetrating comments on science and religion, scientific freedom, science under Nazism and Communism,

the population explosion, and other significant topics that one least expects to find in such a volume; yet these topics are treated in a fresh and stimulating manner, free from the meaningless slogans with which they are all too frequently bedecked, even by scientists of high repute. The book, which terminates with an informative brief essay on the history of zoology, is a remarkable, pioneering venture from beginning to end, and it fully achieves what it sets out to do—to introduce the student to the panorama of general zoology.

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Space Medicine Symposium

Psychophysiological Aspects of Space Flight. B. E. Flaherty, Ed. Columbia University Press, New York, 1961. x + 393 pp. Illus. \$10.

"One can say with confidence that we now possess all the basic knowledge required to keep a man alive in space for a limited, yet significant, period of time." With this sentence, General Otis O. Benson introduces the collected papers from the 1960 space medicine symposium conducted by the USAF School of Aviation Medicine, which are presented in this book. The book is organized into four sections: Technical Background, Critical Problem Areas, Problems of Human Reliability, and Special Techniques of Control. The range of contributors is remarkable—from program managers like Donlan of Project Mercury, through researchers in governmental biomedical laboratories, to the most respected of basic scientists like Magoun, Kleitman, and Halberg. Where the authors have applied themselves specifically to the problems of man in space, there seems to be general agreement with Benson's position.

The book is notable in several different respects. It contains a managerial description of the Mercury program. There are excellent summaries of such diverse subjects as sensory deprivation, the neurophysiology and neuroendocrinology of stress, circadian rhythms, and operator proficiency. Several aspects of isolation and confinement are presented, including results from space cabin simulators, water immersion devices, isolated arctic stations, and cubicles in university laboratories. One conclusion