

Book Reviews

Diseases of the Thyroid Gland, by ARTHUR E. HERTZLER, C. V. Mosby Co., St. Louis, Ed. 3, 1935. Pp. 348. Price \$7.50.

The third edition of Hertzler's well known volume is, like its predecessors, one of the best short texts on the treatment of diseases of the thyroid gland. It contains a special chapter by Victor E. Chesky on the hospital management of goiter patients, which should be carefully read by every student of the subject, as the success of a goiter operation depends to a very great extent upon proper preparation of the patient and determination of the time when operative treatment should be instituted. It is only by a most minute attention to details that the mortality can be reduced to 1 per cent or less, a goal for which every surgeon in this field should strive. The illustrations, printing and general make-up of the book are, as always with Hertzler's publications, admirable.

Surgical Pathology of the Thyroid Gland, by ARTHUR E. HERTZLER, J. B. Lippincott Company, Philadelphia, 1936. Pp. 298. Price \$5.00.

This volume is an essential supplement to *Diseases of the Thyroid Gland*, by the same author, reviewed above. The amusing preface, in which the progress of many medical problems is likened to a herd of milling cattle on the approach of a storm, should be read by every surgeon. The early part of the book covers the normal morphology of the thyroid, its gross anatomy, the various stages in its development, and the alterations which it undergoes in old age. Chapters on the various goiter lesions follow, all abundantly illustrated. The non-toxic and the toxic forms, both typical and atypical, are reviewed. The handling of the somewhat difficult subject of thyroiditis is of the best. There are sections on myxedema and fetal adenomas, and a final chapter dealing with tumors.

The book is well printed; the illustrations are excellent; the text, based largely upon the author's experience, is practical and common-sense, revealing a wide experience and shrewd judgment. It is a valuable summary of what is known on the surgical pathology of the thyroid gland.

Elements of Nuclear Physics, by FRANCO RASETTI. Prentice-Hall, New York, 1936. Pp. 327. Price \$4.50.

This volume originated in a section of a general treatise on physics in Italian, but the advances in nuclear physics have been so rapid in the one and one-half years since the Italian text was published that essential modifications of the latter have been necessary in this edition. The aim of Rasetti, who is one of the group working with Professor E. Fermi in Italy, is to give in concise form a survey of the present status of nuclear phenomena from the experimental as well as the theoretical point of view.

The introductory chapters contain a survey of the early work on the method of detection and measurement of radiations from radioactive substances, the general laws of radioactive disintegration, and a discussion of the interaction of radiation with matter, which includes the energy range for alpha particles and protons, and the various theories which have been erected to explain the stopping power of matter for heavy charged particles. The range of electrons both slow and fast is discussed, introducing the newer knowledge obtained from a study of the electrons produced by cosmic ray activity.

The text then turns to alpha, beta, and gamma ray spectra of the natural radioactive elements and devotes considerable attention to the Geiger-Nuttall law, which shows a relationship between the energy or range of an alpha particle and the mean life of the radiating substance. Useful tables are given of the mean range in air of various alpha groups. Gamma rays are then considered, and the advance in our knowledge is shown by the fact that it is now possible to state with some certainty that the emission of radiation from the nucleus is due to the motion of heavy particles, such as protons, alpha particles,

and neutrons. It is interesting that substances which emit nuclear gamma rays also emit characteristic x-rays since the internal conversion of a gamma ray leaves the atom ionized in an inner electron shell. However, instead of the emission of an x-ray quantum, it may be converted in another electron shell with the emission of a new photoelectron, a phenomenon known as the Auger effect.

Chapter V discusses the general properties of nuclei, including the problem of isotopes. The earliest studies on the subject were made on lead, that extracted from uranium minerals consisting of an isotope of atomic weight 206, whereas lead from thorium minerals is isotope 208. Thus different types of lead represent a final stable product of the two radioactive series. The discovery of heavy water has, in this connection, been of interest as effecting artificial disintegration when its velocity is greatly increased by an instrument such as the cyclotron.

Chapter VI, one of the most interesting in the book, gives a thorough survey of the present status of artificial disintegration of nuclei. The subject is still in a somewhat confused state, as some of the mathematical assumptions do not agree with the experimental results. Figures are given illustrating the anomalous scattering of alpha particles in helium and boron. The first example of artificial disintegration was observed by Rutherford in 1919 while bombarding nitrogen with alpha particles. For many years such artificial disintegrations were obtained only by means of alpha particles emitted by natural radioactive elements and consisted in the capture of the incident alpha particle and the emission of a proton. In 1932 the experimental studies of Curie and Chadwick led to the discovery of the neutron, which was found to be emitted by light elements bombarded with alpha particles, and in the same year nuclear reactions were demonstrated by Cockroft and Walton using artificially accelerated positive ions. In their case the transmutation was of lithium by protons. The study of these fundamental problems of the constitution of the nucleus and of artificial disintegration require, as a rule, high voltages and consequently are dependent upon improvements in high tension technic, in which Lauritsen, Tuve, Lawrence and Livingston have made important contributions. The subject is exceedingly complex and discoveries are being published almost daily, the most recent being the artificial production of a series of radioactive products such as occurs in nature.

The final chapter is on cosmic rays. As the author states, it is evident that we know little that is certain concerning these interesting radiations. Most of the effects observed at sea level seem to be due to primary charged corpuscles, probably electrons, positrons and protons, but the possibility that at high altitudes the effect may be due to photons can not be denied. No satisfactory explanation of the origin of these rays has been advanced up to the present time.

The book concludes with an interesting series of cloud-chamber pictures, mass spectrographs illustrating points in the text, and a short bibliography. It will prove heavy going for those without much knowledge of physics, and some of the mathematical discussions are only for the expert, so it is a book for the specialist though containing much information which the educated person can understand and enjoy.

The Renaissance of Physics, by KARL K. DARROW, The Macmillan Co., New York, 1936. Pp. 306. Price \$3.00.

This volume is entirely different from that by Rasetti, reviewed above. Instead of being written for the specialist, it is intended for the intelligent person who wishes to know more of what is going on in modern atomic physics and desires some information concerning high-voltage x-ray apparatus, cyclotrons, cloud-chambers, and cosmic rays. An extension of a course of lectures given at the Lowell Institute in Boston, it possesses the simplification necessary for a popular text and for this reason mathematics has been eliminated.

In general, the historical record forms the basis for the discussion. The English is clear, the style is attractive and simple, and the author does not hesitate to turn aside and talk of other matters when such diversion is useful in explanation of some of the phenomena. There are excellent pictures and detailed descriptions of various types of physical apparatus and of pertinent spectra and a number of beautiful reproductions of cloud chamber tracks, including showers of electrons, both positive and negative, produced by cosmic rays.

The book is one which anybody with a modest education can read with profit and

pleasure and at the same time lacks much of the injected emotionalism of the daily press reports. Darrow, being a physicist of parts and surrounded by men working on physical problems, some of whose discoveries are recorded in this volume, speaks with authority, so that the accuracy of his statements cannot be challenged. In the facts themselves there is sufficient dramatic quality.

A Text-Book of Pathology, edited by E. R. BELL, Lea and Febiger, Philadelphia, Ed. 2, 1934. Pp. 767. Price \$8.50.

This excellent text-book, originally reviewed in this journal in 1931 (vol. 15, p. 883), has been increased in the second edition by over 100 pages and about 50 illustrations. Most of the latter are photographic and are very satisfactory, though, in the reviewer's opinion, the photomicrographs in a student's text-book should carry the approximate magnifications. A useful feature is the inclusion of a considerable number of reproductions from x-ray films. In general, the references are satisfactory; they are derived largely from American sources, in obvious recognition of the fact that the medical student is not a linguist.

Many chapters have been prepared, as in the previous edition, by the senior author, and members of the staff of the University of Minnesota have contributed the sections in their special fields, notably McCartney on diseases of the liver and gallbladder, Clawson on diseases of the heart, and Downey on diseases of the blood. Downey's chapter and that on diseases of the urinary system by the senior author are particularly good. A chapter on diseases of the bones and joints has been added. A few pages on the lesions of the tendons and tendon sheaths might profitably have been included.

The chapter on tumors, which will particularly interest the readers of this Journal, has been written by Bell and is a good survey of the fundamentals of the subject, with the addition of 20 pages and 10 illustrations. The classification adopted is a simple one, amply sufficient for present use. But little space is devoted to purely theoretical discussions and yet nothing is omitted which is useful. Special types of tumors are also illustrated in the various chapters devoted to individual organs. The book is one of the best short texts for undergraduate instruction.