of how he describes a disease will be helpful to those who want to write adequate and readable descriptions of medical entities. The chapter on therapy emphasizes the need for detailed instruction of patients and for a definite order to discontinue all previous medications. The sections on contact dermatitis, the medicolegal aspects of occupational dermatoses, and the treatment of dermatitis venenata are particularly well done. Especially instructive is a hypothetical case presentation that sets forth in detail an interview in which the nature of the dermatitic process is explained to the patient and the latter's cooperation is enlisted in ferreting out the contact irritant.

Insofar as possible, the former dermatological classification based on type of cutaneous manifestation has been replaced by one based on causative agent. The coverage of metabolic skin diseases is six times as extensive as that in the initial printing of the tenth edition in 1939. The doubling of space devoted to embryology of the skin accords with the interest manifested in this subject at the annual meetings of the American Academy of Dermatology and Syphilology in December 1956.

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Beiträge zur Geschichte der Erkenntnis des Erdmagnetismus. Heinz Balmer. Sauerländer, Aarau, Switzerland, 1956. 892 pp. Illus. DM. 30.

Even before starting his studies at the University of Berne, Switzerland, the author was interested in old scientific illustrations and in biographies of scientists. He selected geography as his major field, the history of Switzerland and physics as his minor fields. A first version of the present book was accepted in 1953 as his Ph.D. thesis.

In the first part of the book (pp. 27–230), the author presents highlights of writings on terrestrial magnetism, starting with selected items from Chinese writings of about 2000 years ago and ending with publications of about 100 years ago. In this section he includes a discussion of the history of technical terms and instruments related to terrestrial magnetism—for example, magnets, the compass and the directions marked on it, and magnetic declination and inclination. The last 16 pages of this section contain historical information related to observations of changes in the direction of the magnetic needle in space and time and to suspected effects of auroras and of oxygen in the atmosphere.

In the second part of the book (pp. 231–520), the author gives extensive selections from writings by Galilei, Mercator, Kepler, William Gilbert, A. von Humboldt, and others. He uses German translations if the originals are in a different language. The third section (pp. 521–579) deals with three special subjects: the myth of the magnetic mountain; ideas which, at the time of Galilei, foreshadowed the magnetic telegraph; and publications on terrestrial magnetism written in Switzerland between about 1500 and 1850. This section includes historic information on sundials. Finally, the author gives a detailed bibliography and biographies of persons mentioned in the text. An author index and a subject index conclude the book.

This book is recommended reading for anyone interested in the history of natural sciences. The 45 illustrations include reproductions of old cuts showing magnetic instruments, especially compasses, and old maps related to problems of terrestrial magnetism—for example, a map by von Humboldt indicating the earth's magnetic field for 1600, 1700, 1800, and 1830, and one by Halley for 1702. Frequently the author includes short discussions of problems which are only distantly related to terrestrial magnetism. Extensive parts of the book are of greater interest to historians than to students of terrestrial magnetism. For example, the author points out that Columbus, on his first voyage, realized, from comparing the direction given by the compass with that obtained from star observations, that they show a difference which changes gradually between Europe and the West Indies; on his second voyage he used this information to determine the approximate position of his ships. On the other hand, of interest to students of terrestrial magnetism are detailed reports on the changes of the earth's magnetic field in course of time, and historic information on attempts to locate the magnetic poles.

The book contains a large amount of historical information, but no modern concepts are discussed. Although probably few will want to read it from cover to cover, everyone interested in the history of science will find interesting sections in it. Typography and reproduction of figures are good.

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Progress in Cosmic Ray Physics. vol. III. J. G. Wilson, Ed. North-Holland, Amsterdam; Interscience, New York, 1956. 420 pp. Illus. $10.50.

The study of cosmic rays has advanced so rapidly in the last decade that it has become impossible even for the specialist to keep up with the many papers published in physics journals in various countries. Also the subject of cosmic rays has now been subdivided into many specialized aspects, some of them dealing with the nuclear physics problems of high-energy particles, some with the origin of cosmic rays and their distribution near the earth and in the universe. Inevitably this has involved an ever-increasing group of physicists in the cosmic-ray field,—on the one hand, nuclear physicists working on new types of elementary particles with high-energy accelerators, and, on the other hand, astrophysicists and astronomers who are concerned about the phenomena that occur in the atmosphere of stars and in the interstellar space where acceleration of cosmic rays probably takes place.

The need has therefore been great for review articles which summarize the current state of knowledge in a certain field of cosmic-ray investigations. Under the capable editorship of J. G. Wilson of the University of Leeds, several volumes have been published containing contributions by outstanding specialists which summarize the state of research in their field. The present volume, the third in this series, contains four chapters. K. Greisen of Cornell University discusses experiments, their interpretation, and the theory of the so-called "extensive air showers," phenomena which are produced by cosmic rays of extremely high energies, between 10^{14} and 10^{18} electron volts. In complicated nuclear and electromagnetic interactions the original particle produces at lower altitudes in the atmosphere often millions of secondary particles which will hit the earth like a shower over an area of about 100 yards' radius; hence, the name.

The second chapter, written by H. S. Bridge of Massachusetts Institute of Technology, summarizes present knowledge of unstable elementary particles with mass between the electron and the proton (the mesons) and with mass greater than that of the proton (the hyperons). These particles are all produced in high-energy nuclear interactions of cosmic rays, either with atoms in the atmosphere or, in this case, with atoms in photographic plates which are used to detect these events. It is thought that the problem of nuclear forces is closely tied up with the nature of these particles.

The third chapter by R. W. Thompson of Indiana University discusses yet another group of unstable particles observed in cosmic radiation, namely, those carrying no charge. They too play an important part in the theory of nuclear forces.

The last chapter by G. Puppi of the University of Bologna considers the problem of cosmic rays in the atmosphere and investigates what happens to the cosmic-ray energy which enters at the top of the atmosphere. Puppi shows that a certain fraction of the energy goes to

produce the unstable mesons, many of which reach the bottom of the atmosphere and even penetrate deep down into the earth. Another fraction of the energy goes into electrons and photons and eventually appears as ionization in the atmosphere. Another fraction is in the nucleonic component, some of the energy being used to break up atmospheric nuclei. Finally, in many of these interactions, energy escapes in the form of neutrinos and is never recovered. Almost one-fourth of the energy goes into neutrinos, about 60 percent into ionization in the atmosphere, about 10 percent into breaking up nuclei, and the remainder penetrates into the earth.

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Recent Progress in Hormone Research. vol. XII. Proceedings of the Laurentian Hormone Conference, 1955. Gregory Pincus, Ed. Academic Press, New York, 1956. 453 pp. Illus. $10.

Vitamins and Hormones. vol. XIV. Advances in research and applications. Robert S. Harris, G. F. Marrian, and Kenneth V. Thimann. Academic Press, New York, 1956. 486 pp. Illus. $10.

Both of these books attempt to present the recent advances in endocrinologic and vitamin research. Endocrinology is moving so rapidly that it is essential to have the means whereby new advances can be quickly disseminated. In this aim these two volumes will aid the busy investigator to a large measure but not completely.

Recent Progress in Hormone Research is divided into four parts: "Hormone biosynthesis and metabolism," "Hormones and metabolism," "Pituitary hormones," and "Sex hormones." The following chapters add new life to this series: "The adrenal medulla and the biosynthesis of pressor amines" (Paul Hagen and A. D. Welch); "Influence of steroids on cerebral metabolism in man" (Gilbert S. Gordon); "Human urinary gonadotropin" (A. Albert); "Pituitary syndromes in man" (Roberto F. Escamilla); "Male sex hormone and its role in reproduction" (Thaddeus Mann); and "Clinical studies of testicular hormone production" (R. B. Leach, W. O. Maddock, I. Tokuyama, C. A. Paulsen, W. O. Nelson). As a matter of fact, these contributions make this volume a *must* for the reading list and permanent scientific library of the busy endocrinologic investigator.

The current issue of *Vitamins and Hormones,* volume XIV, presents a truly remarkable synthesis of current and *new* research developments by eight contributors from Great Britain, Germany, and the United States. This volume is by far the most scholarly ever produced in this series, and all eight chapters will provide enough stimulation for at least the next 5 years. This volume includes: (i) "Intestinal synthesis of vitamins in the ruminant" (Olaf Mickelsen); (ii) "Some aspects of vitamin-A metabolism" (J. S. Lowe and R. A. Morton); (iii) "Regulation of carbohydrate metabolism in isolated tissues" (A. E. Renold, J. Ashmore, A. Baird Hastings); (iv) "Experimental hyperglycemic states not primarily due to a lack of insulin" (K. H. Shull and Jean Mayer); (v) "Biochemical studies on insect hormones" (Peter Karlson); (vi) "Glucuronide metabolism, with special reference to the steroid hormones" (G. A. Levvy); (vii) "Bioassay of pituitary and placental gonadotropins in relation to clinical problems in man" (J. A. Loraine); and (viii) "Microbiological transformations of steroids and their applications to the synthesis of hormones" (S. H. Eppstein, P. D. Meister, H. C. Murray, D. H. Peterson).

It is encouraging to have our foreign colleagues contribute so unselfishly to these two volumes. The endocrinology of the male receives a comprehensive evaluation and elucidation in the scholarly approach of Mann. His personal researches in a world-famous laboratory and his critical appraisal of hitherto embalmed "facts" provide not only a clear statement of male endocrinology but a sterling example of the scientific method. The pioneering researches of Mann and his associates at Cambridge University have illuminated an area of endocrinology that has been befogged with numerous misconceptions. Following the comments on the role of the male sex hormone in reproduction by Mann, in *Recent Progress in Hormone Research,* the observations on the clinical studies of testicular hormone production, in the chapter by R. B. Leach and his colleagues, prove of great scientific interest. This chapter indicates that (i) the Leydig cells, rather than Sertoli or germinal cells, are the source of estrogen secreted by the human testis; (ii) adult functioning Leydig cells respond to stimulation with human chorionic gonadotropin by secreting increased amounts of both androgens and estrogens; (iii) the increased titers of androgen and estrogen act on the pituitary, thereby inhibiting the secretion of the gametogenic hormone (F. S. H. in the male) and thus producing seminiferous tubule damage; and (iv) estrogen secretion is a more reliable and sensitive indication of Leydig cell function than is the excretion of the numerous 17-ketosteroids. (The authors conclude that "the most probable explanation for this is that 80 percent or more of estrogens normally arise from the testes, whereas less than half of the 17-ketosteroids originate from Leydig cell secretion, the majority being of adrenal cortical origin.") These two chapters on the male sex hormone are enlightening both from a research point of view and as an important contribution to the medical profession.

Levvy's chapter on glucuronide metabolism, with special reference to the steroid hormones, in *Vitamins and Hormones,* represents a careful appraisal of what is known concerning glucuronide metabolism. This chapter, which is heavily laden with significant references, indicates that (i) "quantitative changes in the β-glucuronidase activity of animal tissues do not necessarily provide qualitative evidence on the function of the enzyme"; (ii) "so far as the possible function of β-glucuronidase is concerned, there is nothing on which to base an opinion except its hydrolytic action on steroid and other glucuronides"; (iii) "the β-glucuronidase activity of all body tissues appears to be under endocrine control. It does not follow that an alteration in enzyme activity produced by a hormone is an essential feature of the metabolism of that hormone, nor that it is in any sense an adaptive response"; (iv) "in healthy individuals, deviations from the mean in the β-glucuronidase activity of an organ or body fluid may reflect variations in endocrine constitution, and in the extreme case peculiar susceptibility to degenerative disease"; and finally, (v) "the activity of the enzyme in sex and nonsex organs is under endocrine control and is also governed by hereditary factors." Biochemists working in this active area of research will find Levvy's analysis of present-day knowledge on the β-glucuronidase enzyme extremely worth while.

In the final analysis, both volumes are factual and are truly an asset to the scientific literature. The editors of both volumes are to be congratulated for their continued service in these ever-expanding areas of knowledge concerned with the hormones and vitamins.

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Principles of Color Television. Hazeltine Laboratories Staff. Knox McIlwain and Charles E. Dean, Eds. Wiley, New York; Chapman & Hall, London, 1956. 595 pp. Illus. $13.

When, on 17 December 1953, the Federal Communications Commission gave its approval to the transmission standards for compatible color television broadcasting which had been proposed by the National Television System Committee, new and unfamiliar problems were posed for the rank and file of engi-