Denis M. Shaw reports on "The geochemistry of gallium, indium, thallium." The history, chemistry, and cosmic abundance are discussed, then the geochemistry of each is separately reviewed. Outstanding problems needing investigation are summarized: geochemical affinities and cosmic distribution as deduced from meteorites; occurrence in sulfides; precise analyses aimed toward investigating the perplexing tin-indium association; and greater analytical sensitivity for restudy of distribution of indium in silicates. The association of thallium and manganese in sediments needs confirmation.

P. J. Melchior reviews "Latitude variation." He makes very clear the importance and difficulty of the observational procedures and the enormous patience and care of the International Latitude Service. The maximum diameter of the curve described by the instantaneous pole observed since 1900 is about 0.7 second, corresponding to a displacement of 21 meters on the earth's surface. The variations of latitude determined by astronomical observations contribute to problems involving elastic deformations of the earth, secular displacement of the mean pole, and some of the dynamical properties of a liquid core.

Volume 2 has subject index and name index, and each chapter has many references. The careful study of this book pays large dividends in broadened horizons.

WILLIAM R. THURSTON
National Academy of Sciences–National Research Council

Natürliche und Künstliche Erbänderungen. Probleme der mutationsforschung. Hans Marquardt. Rohwolt, Hamburg, Germany, 1957. 177 pp. Illus. Paper.

Radiation genetics is, at the moment, in a strange situation. There is, on one hand, a great general interest in the effects of atomic radiations on our hereditary substance, and there exist, on the other hand, no manuals or textbooks to inform the public, or members of the medical profession, biologists, radiobiologists, and physicists, of the present stage of mutation research. To bridge the gap, H. Marquardt, professor of forest-botany at the University of Freiburg (Breisgau, Germany), presents in this little booklet (No. 43 of Rohwolt's *Deutsche Enzyklopädie*), in five chapters, a well-rounded picture of the existing situation, tying the principal experimental facts of mutation research into a unit with the logical conclusions and consequences. There is a short survey of the historical development, followed by chapters that deal, respectively, with the cytological foundations, the genetic foundations, the mutation process, and the importance of modern mutation research for our technical age.

The book is written in a clear, pleasant, and musical diction—Marquardt holds, besides his Ph.D. in biology, a doctor's degree in music—and reads like a thrilling report on an expedition in unknown territories. It is surprising how much—by proper arrangement of the facts—can be said in such a small volume. The book will definitely fill a present need and will be welcomed in wide circles; only the language barrier will limit its use.

A. T. KREBS
Radiobiology Department, U.S. Army Medical Research Laboratory, Fort Knox, and *Biology Department, University of Louisville*

Climatology. Treated mainly in relation to distribution in time and space. W. G. Kendrew. Oxford University Press, New York, ed. 2, 1957. xv + 400 pp. Illus. + plates. $6.75.

Although this is a revision of the first edition, published in 1949, it is essentially a moderately altered edition of *Climate,* published in 1930, which contained most of the material of the present edition. Numerous small changes have been made, and a few new paragraphs have been added, together with an inadequate bibliography, mostly of British publications.

This volume was written "for the general reader" and affords brief statements about numerous aspects of climate, with, however, few explanations of the causes for the local differences. Part 1 (10 chapters) concerns insolation and temperature; part 2 (7 chapters) deals with atmospheric pressure and winds; part 3 (11 chapters) deals with atmospheric vapor and its condensation and also with sunshine and visibility. Mountain climates are discussed in part 4 (5 chapters), and the "weather of the westerlies" is covered in part 5 (5 chapters). The final part (3 chapters) is called "Some climatic types."

In addition to illustrations of the conventional aspects of climate there are brief discussions of smog, fronts, periodicities, hail, tornadoes, and hurricanes. The presentation is formal or "heavy." The examples are largely from the British Isles or from British colonies or ex-colonies. This volume is not suitable as a text, nor is it one of the better popular treatments of the subject.

STEPHEN S. VISHER
Department of Geography, Indiana University

The Pigeon. Wendell Mitchell Levi. Levi Publishing Company, Sumter, S.C., 1957. xxvii + 667 pp. Illus. $20.

Biologists, psychologists, and others who study the pigeon have made good use of the first edition of this book, and the second edition carries them further into W. M. Levi's debt. An enormous amount of information is brought together from the most diverse sources. Much of it, particularly the discussions of breeding, housing, care, and diseases, is of great practical value to those studying the pigeon in laboratory or loft. The beautifully illustrated sections on the history and varieties of pigeons are of more general interest. The sections on anatomy, physiology, genetics, and behavior could not, in the nature of the book, be complete, but they are useful accounts for the nonspecialist. The section on commercial squab production, though of no immediate scientific interest, is written with special authority. There are delightful miscellanies scattered through the text. Among the 1127 illustrations the reader will find pictures of Old English dovecotes, Egyptian-style multiple lofts, bells attached to the feet of pigeons in Bali, and a set of 15 perfectly tuned pipes once sewn to the tail feathers of a pigeon in Peking.

So ambitious an undertaking is bound to have an occasional blemish (the index is not fully adequate, for example), but the book is, nevertheless, a landmark in the literature on the pigeon. Beyond that, it is an achievement of a dedicated layman (Levi, though he served in a Pigeon Section of the Signal Corps in World War I and has been an officer in many organizations concerned with pigeons, is a lawyer) which might put many a professional scientist to shame.

B. F. SKINNER
Department of Psychology, Harvard University

Die Periphere Innervation. Emil Villiger. Schwabe, Basel, Switzerland, ed. 11, 1957. 210 pp. Illus. $5.

This book on the peripheral nervous system is the companion volume to Emil Villiger's well-known text on the anatomy of the brain and spinal cord. After ten years it now reappears in its eleventh edition, attesting to its perennial popularity. Since Professor Villiger's death, both volumes have been taken over and revised by his successor, Eugen Ludwig, presently professor emeritus of anatomy at the University of Basel.

Die Periphere Innervation begins with a completely new chapter on the general characteristics of peripheral nerves, including data on their ultrastructure as

revealed by the electron microscope, anastomotic fiber patterns, and the fiber spectra of nerves and nerve roots. The author next takes up the pattern and divisions of the spinal nerves and their connections with the peripheral, sympathetic, and central nervous systems. This is followed by detailed descriptions of the spinal nerves considered individually, their plexuses, and their sensory or motor destinations. This section includes useful summaries for quick reference, as well as tables of motor functions. In the succeeding chapter, the cranial nerves are considered in comparable detail, and information is given about their central origin and their peripheral interconnections and functions. Another chapter deals with the autonomic nervous system as a whole, in particular with the sympathetic innervation of the viscera, and reviews the autonomic contribution to the somatic nerves and the parasympathetic innervation of the head. There follows a brief chapter on the central pathways involved in perception and in reflex and voluntary movement. This is strictly traditional in viewpoint, naturally oversimplifying somewhat, and serves as an introduction to the book's final section, which relates neurological symptoms—paralytic, irritative, and release phenomena—to their anatomical substrate and describes the clinical picture of lesions of the spinal and cranial nerves.

The book is illustrated with clinical photographs as well as with a series of line drawings which are models of clarity and good draftsmanship. One might have wished for some consideration of peripheral sensory receptors, and for more attention to the alpha and gamma spinal efferent systems in view of their increasing physiological importance. Likewise, the absence of a bibliography will handicap the research worker. Nonetheless, this is an excellent and authoritative text for the medical student, practitioner, or specialist, although it is only fair to point out that much of this material is included in general textbooks of anatomy.

ALAN B. ROTHBALLER
Albert Einstein College of Medicine

New Books

X-Ray Microscopy and Microradiography. Proceedings of a symposium held at the Cavendish Laboratory, Cambridge, 1956. V. E. Cosslett, Arne Engstrom, H. H. Pattee, Jr. Academic Press, New York, 1957. 663 pp. $16.50.

Principles of Ophthalmoscopy. John K. Erbaugh. Thomas, Springfield, Ill., 1958. 79 pp. $5.50.

Biographical Memoirs of Fellows of the Royal Society. vol. 3. Royal Society, London, 1957. 328 pp. 30s.

Les Méthodes Nouvelles de la Mécanique Céleste. vol. I, *Solutions Périodiques*; Non-existence des intégrales uniformes, solutions asymptotiques; vol. II, *Méthodes de MM. Newcomb, Gyldén, Lindstedt et Bohlin*; vol. III, *Invariants Intégraux*: Solutions périodiques du deuxième genre, solutions doublement asymptotiques. H. Poincaré. Dover, New York, 1957 (unabridged and unaltered republication of the volumes originally published in 1892, 1893, and 1899). 382 pp.; 479 pp.; 414 pp. $2.75 each; set, $7.35.

Annual Report of the Board of Regents of the Smithsonian Institution. For the year ended 30 June 1956. Publ. 4272. Smithsonian Institution, Washington, D.C., 1957 (Order from Supt. of Documents, GPO, Washington 25). 580 pp. $4.50.

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Treatise on Marine Ecology and Paleoecology. vol. 1. *Ecology.* Geological Society of America Memoir 67. Joel W. Hedgpeth, Ed. Geological Society of America, New York, 1957. 1304 pp. $12.50.

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An Introduction to Chemical Thermodynamics. E. F. Caldin. Clarenden Press, Oxford, 1958 (order from Oxford University Press, New York). 439 pp. $8.

An Introduction to the Foundations and Fundamental Concepts of Mathematics. Howard Eves and Carroll V. Newsom. Rinehart, New York, 1958. 378 pp. $6.75.

Basic Animal Husbandry. John M. Kays. Prentice-Hall, Englewood Cliffs, N.J., 1958. 443 pp. $7.

Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

Proceedings of the VIth Annual Meeting of the Japan EEG Society. Held in Sapporo 2–3 July 1957. Takashi Minoshima, Ed. Physiological Laboratory, Research Institute of Applied Electricity, Hokkaido University, Sapporo, Japan, 1957. 141 pp.

A Survey of Geology-Geophysics Students in the Colleges and Universities of the United States and Canada in 1956–57. Compiled by Bonnie C. Henderson. 1958. 9 pp. $0.50. *Earth for the Layman.* AGI Report 2. Mark W. Pangborn, Jr., ed. 2, 1957. 68 pp. $1. American Geological Institute, Washington 25.

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The Attenuation of Gamma Rays and Neutrons in Reactor Shields. Herbert Goldstein. U.S. Atomic Energy Commission, Washington, 1957 (order from Supt. of Documents, GPO, Washington 25). 295 pp. $2.

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