the use of aerial photographs. Chapter 10 discusses detailed mapping and sampling techniques, including methods appropriate for underground work. Chapter 11 is devoted to the preparation of geologic reports and has especially valuable sections on the proper use of lithologic, fossil, and formational names, and on various methods of illustration.

The last four chapters (117 pages) are outstanding. They treat field work with sedimentary, volcanic, igneous and igneous-appearing plutonic, and metamorphic rocks. The significant textures and structures of each type are described and explained, and appropriate methods of studying and of representing these features are suggested. Numerous illustrations of hand specimens and outcrops are included, and small-scale features are related carefully to larger structures. These four chapters include 79 references to significant work by American and European geologists. Unfortunately, Compton is too modest to cite his own work.

The nine appendixes include lists of necessary equipment and supplies, abbreviations for field notes, and symbols for geologic maps and cross sections. The index is complete. Future editions might be improved by a brief discussion of mineral staining and other chemical techniques that can be applied in the field, and the inclusion of a glossary.

This book is impressive and should become a standard reference in field geology. In addition, the last four chapters make the book valuable as a supplementary text for structural geology and petrology courses as well as excellent reading for all geologists concerned with field studies.

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Aerial Photography

Photogeology. V. C. Miller and Associates. McGraw-Hill, New York, 1961. vii + 248 pp. Illus. $13.50.

Miller's book represents the latest addition to a growing volume of literature on the interpretation of aerial photography, a field that has provided a unique new approach to the study of the earth's surface features, with far-reaching effects on procedures in topographic, geologic, forestry, and soil mapping, and in many fields of research. Miller is concerned primarily with one sector of the general subject, the qualitative interpretation of air photographs as a means of mapping bedrock geology, particularly from the standpoint of mineral exploration.

The volume is divided into three main parts. The first, slightly less than one-quarter of the book, is devoted to the mechanics of procuring, handling, and examining photos, with emphasis on stereoscopic methods. The treatment of distortion and vertical exaggeration of the stereoscopic image is well handled; but the discussion of instrumental techniques is incomplete, and for information on map-making methods and on the use of oblique photographs, the reader must look elsewhere.

The second part, about one-seventh of the total, considers, in a generalized fashion, the principles and criteria of interpretation. The importance of related field studies is given due attention, and the application of the geomorphic viewpoint is properly emphasized. Difficulties and limitations are faced realistically, the need for a flexible approach is noted, and, unlike some other workers, Miller and his associates scrupulously avoid making exaggerated claims.

The third and major part, somewhat more than half of the total, is more particularized; it is devoted to specific examples, as shown on stereopairs of photographs, with accompanying sketch maps, descriptions, and exercises. The examples represent a well-diversified selection of geologic phenomena, of varying degrees of complexity. However, many of these could be more advantageously studied if additional photographs of surrounding areas were provided to give a broader perspective. It is to be regretted that comparisons between photographs and accompanying maps are hindered by differences in both scale and area. Also, the quality of the photographic illustrations, as they are reproduced, leaves something to be desired, particularly in comparison with those in *Professional Paper 373* (U.S. Geological Survey), which covers similar ground. The source of each one is listed, however, and many readers may choose to procure prints of the originals for detailed examination.

A bibliography of more than 350 entries concludes the book. Very few references are made to it in the text, however, and the correlation of references with particular sections of the text is not evident.

All in all, the book constitutes a useful supplement to the available reference material on photogeology, and it should be of some service to advanced students who have a sufficient background in geology and in the study of photographs to use it. The subject is much too broad to be fully covered in any one tome, however voluminous, and new contributions from new viewpoints are always welcome.

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Finsen Memorial Congress

Progress in Photobiology. Proceedings of the Third International Congress on Photobiology. B. C. Christensen and B. Buchmann, Eds. Elsevier, New York, 1961. xv + 628 pp. Illus. $25.

The term *photobiology* has an appropriate connotation that extends throughout almost the entire spectrum of biological activities and subdivisions; as a consequence, one can find photobiologists in many scientific disciplines, including the somewhat more applied areas of agriculture and medicine. The phenomenon that unifies this diverse group is the biological action of photochemical radiations, ranging from ultraviolet on the short side of the electromagnetic spectrum to infrared on the long side. The ionizing radiations, both electromagnetic and particulate, are excluded, arbitrarily it might seem, but also necessarily; the biological action of all radiations, political as well as scientific, is too vast a topic to span successfully in a single congress—this plus the fact that each of the fields of ionizing and photochemical radiations has its own peculiar problems of reaction, instrumentation, and technique.

The interest in these international symposia, of which this is a report of the third, may be appreciated from the fact that this volume contains in excess of 150 papers presented at the 1960 Copenhagen meetings. It is not feasible to single out for review even a selected portion of these papers without doing an injustice to others, but the coverage and extent of interest can be judged by

the titles of the various symposia and the names of guest lectures. The symposia, which included 60 substantial papers, were as follows: Strahlungsklima und seine Messung; Biological Action Spectra; Photoreceptors in Aquatic Organisms; Lupus vulgaris; Initial Mechanisms Involved in Radiation Effects; Photoreactivation; and Phototherapy. The four guest lectures were entitled "Plant cell response to visible light—excluding photosynthesis," given by H. Virgin of Stockholm; "Light induced phosphorylation," D. I. Arnon, Berkeley; "The effects of long visible and near infrared radiation," H. Mohr, Tübingen; and "Biologische Uhren," J. Aschoff, Heidelberg. The remaining papers were presented in seven more or less general sessions, and it is apparent from their contents that a pronounced trend toward photochemistry, with emphasis on the physical interaction of light with specific molecular species, is evident. This is a measure indicative both of a developing maturity and sophistication, the movement of research being away from the purely biological description of results toward the investigation of basic mechanisms, and of a growing awareness that one of the most profound influences in our environment is that of light itself, with various segments of the electromagnetic spectrum having precise effect on a number of regulatory phenomena.

It is worthy of notice that the Third International Congress of Photobiology was designated the Finsen Memorial Congress. Niels R. Finsen, born in 1860, was a Danish doctor, interested medically in the eradication of the vitamin-deficient disease, lupus vulgaris, but equally interested in the quantitative physical, chemical, and biological effects of light of various qualities. When one considers that much of this work was done prior to the discovery of x-rays, one can readily appreciate how far advanced Finsen was in his appreciation of some of the problems of "light and life." He can, justifiably, be called the father of photobiology, and so deserves the honor conferred on him.

It is equally appropriate to mention that the rapid development of, and current interest in, photobiology has been materially assisted by the organizational ability of a relatively few scientists: A. Hollaender in the United States, R. Latarjet in France, B. C. Christensen in Denmark, and W. Burckhardt in Switzerland, in particular, stand out. This volume, consequently, is several things at once: a sound and extensive survey of an exciting and active field of biology, a memorial to Niels Finsen, and a tribute to those who are continuing in the Finsen tradition.

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New Books

Biological and Medical Sciences

Advances in Cancer Research. vol. 6, Alexander Haddow and Sidney Weinhouse, Eds. Academic Press, New York, 1961. 533 pp. Illus. $13.

Advances in Virus Research. vol. 8. Kenneth M. Smith and Max A. Lauffer, Eds. Academic Press, New York, 1961. 423 pp. Illus. $12.

Childbirth. W. C. W. Nixon. Penguin Books, Baltimore, Md., 1962. 106 pp. Illus. Paper, $0.85.

Cold Spring Harbor Symposia on Quantitative Biology. vol. 26, *Cellular Regulatory Mechanisms*. Biological Laboratory, Cold Spring Harbor, N.Y., 1961. 423 pp. Illus. $8.

Cryptobiotic Stages in Biological Systems. Nathan Grossowicz, Shlomo Hestrin, and Alexander Keynan, Eds. Elsevier, Amsterdam, Netherlands, 1961 (order from Van Nostrand, Princeton, N.J.). 244 pp. Illus. Paper, $5. Proceedings (15 papers and discussion) of the fifth biology conference, *Oholo*, 1960; sponsored by the Israel Institute for Biological Research.

First International Conference on Congenital Malformations, Proceedings. Compiled and edited for the International Medical Congress. Lippincott, Philadelphia, Pa., 1962. 328 pp. Illus. $7.50. The first conference, sponsored by the National Foundation (New York), was held in London 18–22 July 1960.

Fluorescence Assay in Biology and Medicine. Sidney Udenfriend. Academic Press, New York, 1962. 515 pp. Illus. $14.

General Microbiology. William G. Walter and Richard H. McBee. Van Nostrand, New York, ed. 2, 1962. 414 pp. $6.95.

Heredity and Your Life. A. M. Winchester. Dover, New York, 1962 (© 1956). 333 pp. Illus. $1.45 (reprint).

Mathematical Tables for Research Workers in Human Genetics. Shelia Maynard-Smith, L. S. Penrose, and C. A. B. Smith. Little, Brown, Boston, Mass., 1962. 86 pp. Illus.

Methods in Hormone Research. vol. 1, *Chemical Determinations* (423 pp., $16); vol. 2, *Bioassay* (788 pp., $24). R. I. Dorfman, Ed. Academic Press, New York, 1962. Illus.

Mushrooms and Truffles. Botany, cultivation, and utilization. Rolf Singer. Interscience, New York, 1961. 295 pp. Plates. $10.25.

The Orientation of Animals. G. S. Faenkel and G. L. Gunn. Dover, New York, ed. 2, 1962 (© 1940, Oxford Univ. Press, London). 376 pp. Illus. Paper, $2.

The Physiology of Flowering. W. S. Hillman. Holt, Rinehart, and Winston, New York, 1962. 176 pp. Illus. $4.50.

Plants. An introduction to modern botany. V. A. Greulach and J. E. Adams. Wiley, New York, 1962. 572 pp. Illus. $7.50.

Pleuropneumonia-Like Organisms (PPLO) Mycoplasmataceae. E. Klieneberger-Nobel. Academic Press, New York, 1962. 166 pp. Illus. 40s.

Fourth Berkeley Symposium on Mathematical Statistics and Probability, Proceedings. vol. 4, *Biology and Problems of Health*. J. Neyman, Ed. Univ. of California Press, Berkeley, 1962. 420 pp. Illus. $8.50.

The Secondary Glaucoma. J. Francois, Ed. Karger, Basel, Switzerland, 1961. 749 pp. Illus. $19. Proceedings of the first European opthalmological congress held in Athens in 1960.

A Textbook of Comparative Endocrinology. A. Gorbman and H. A. Bern. Wiley, New York, 1962. 482 pp. Illus. $12.50.

Tree Growth. Theodore T. Kozlowski, Ed. Ronald, New York, 1962. 451 pp. Illus. $12.

Social, Economic, and Political Sciences

Asylums. Essays on the social situation of mental patients and other inmates. Erving Goffman. Aldine, Chicago, Ill., 1962. 400 pp. $6.75.

The Calculus of Consent. Logical foundations of constitutional democracy. James M. Buchanan and Gordon Tullock. Univ. of Michigan Press, Ann Arbor, 1962. 372 pp. Illus. $6.95.

Conceptual Systems and Personality Organization. O. J. Harvey, David E. Hunt, and Harold M. Schroder. Wiley, New York, 1961. 387 pp. $7.50.

Deterrence and Defense. Toward a theory of national security. Glenn H. Snyder. Princeton Univ. Press, Princeton, N.J., 1961. 303 pp. $6.50.

Development of the Emerging Countries. An agenda for research. Robert E. Asher *et al.* Brookings Institution, Washington, D.C., 1962. 250 pp. Paper, $2.75; cloth, $3.75.

The Ethnobotany of Pre-Columbian Peru. Margaret A. Towle. Aldine, Chicago, Ill., 1962. 189 pp. Plates. $6.

Heavens Below, Utopian Experiments in England 1560–1960. W. H. G. Armytage. Univ. of Toronto Press, Toronto, Canada, 1961. 465 pp. $6.50.

Homosexuality. A psychoanalytic study. Irving Bieber *et al.* Basic Books, New York, 1962. 366 pp. $8.50.

The Layman's Guide to Psychiatry. James A. Brussel. Barnes and Noble, New York, 1961. 246 pp. Paper, $1.50.

The Nest Architecture of the Sweat Bees. A comparative study of behavior. Shoichi F. Sakagami and Charles D. Michener. Univ. of Kansas Press, Lawrence, 1962. 139 pp. Illus. $5.

Operations Research in Production and Inventory Control. F. Hanssmann. Wiley, New York, 1962. 257 pp. Illus. $8.95.

The Sino-Soviet Conflict 1956–1961. Donald S. Zagoria. Princeton Univ. Press, Princeton, N.J., 1962. 496 pp. $8.50.