The cost of helicopter operation is high, about $100 per flying hour or about $400 a day per helicopter. However, where detailed areal geologic mapping is necessary, in an area such as northwestern Greenland, the over-all cost of using helicopters, considering the saving in time and effort, is about 80 percent of the cost of the same work accomplished by ordinary ground traverses.

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Book Reviews

Traité de Paléontologie. Vol. 3, ***Les Formes Ultimes d'Invertébrés; Morphologie et Evolution—Onychophores, Arthropodes, Echinodermes, Stomocordés.*** Jean Piveteau, Ed. Masson, Paris, 1953. 1064 pp. Illus. 9600 fr.; clothbound, 10,320 fr.

Volume 3 of this stately treatise completes coverage of the invertebrates. The remaining four volumes are to deal with the vertebrates. Twelve collaborators (11 French and one Belgian) contributed to this volume, which covers the arthropods, echinoderms, graptolites, and some minor groups. The arthropods take up half the book and the echinoderms a third.

The onychopora, merostomoids, pseudocrustacea, and marrellomorphs are dealt with by Colette Dechaseaux. These minor, but phylogentically important, groups are represented for the most part by Walcott's genera from his fabulous Middle Cambrian locality in British Columbia. The Scandinavian *Xenusion,* reported to be of pre-Cambrian age, is doubtfully referred to the onychopora (*Peripatus* and allies). If it is as old as it is alleged to be, it is perhaps the oldest recognizable form of multicellular animal life.

A chapter of 203 pages on trilobites is the work of Pierre Hupé. Somewhat more than half of it consists of a full and well-illustrated account of morphology, anatomy, development, habits, distribution, and evolution. The treatment of evolution is comprehensive, well-balanced, and restrained. The systematic part, however, gives the impression of having been hastily put together. It includes new superfamilies, many new families, and a great many new subfamilies. Supergeneric categories are diagnosed; genera are listed, with their age and general distribution. Genera are diagnosed in a publication by Hupé issued in 1953, and that publication contains a much more complete bibliography than this treatise.

The arthropleurids (protoarthropods of uncertain affinities), branchiopods, copepods, and crustacea of uncertain affinities are described by Dechaseaux; the ostracodes by Nicolas Grekoff; and the cirripeds by Henri and Geneviève Termier.

Daniel Laurentiaux contributed the chapters on myriapods and insects. The systematic part of his chapter on insects is a comprehensive survey of fossil insects. The chapters on merostomes, including the gigantostracea (a later name for eurypterids), and arachnids—a complete survey—are the work of Gérard Waterlot.

The echinoderms are very unevenly handled; the heterosteles and cystids are discussed by Lucien Cuénot, who died before the book was published. His treatment of the cystids stands out as the best for any of the major echinoderm classes. The blastoids are described by F. M. Bergounioux; edrioasteroids by Jean Piveteau; crinoids, stelleroids, and ophiocistioids by Georges Ubaghs; and echinoids by the Termiers. The systematic part of the chapter on crinoids is disappointingly and inadequately illustrated. It includes a new order, new suborders, and many new superfamilies.

Gérard Waterlot wrote the chapters on pterobranchs and graptolites, which are given class rank under Dawydoff's recently proposed phylum stomocords. The book closes with the Termiers' discussion of groups of uncertain affinities: machaeridians, conularids, hyoliths, and tentaculites.

The omission of any indication of the number of pages in publications cited in bibliographies appears to be a fixed policy of this treatise. The price is even higher than for Volume 1 or Volume 2.

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[1] I am indebted for advice to P. E. Cloud, Jr., and A. R. Palmer.

Chemie Lexikon, Vols. I and II. 3rd ed. Hermann Römpp. Franckh'sche Verlag, Stuttgart, 1952–53. 2108 pp. Illus. Clothbound, DM84—a vol.

To be successful, an encyclopedia must provide adequately detailed information on every topic coming within its survey, and yet remain both manageable in size and reasonable in cost. In a broad field such as chemistry, these aims are usually achieved by limiting the scope of the book to a particular section, and a number of excellent dictionaries and handbooks dealing with such limited areas of information have been produced. However, there is a need for an all-encompassing chemical encyclopedia to which the specialist may turn for information on other branches of his subject, and where the nonchemist may expect to find answers to any questions of a chemical nature. This need is adequately fulfilled by Dr. Römpp's *Chemie Lexikon.*

Special attention has been paid to the requirements of the businessman engaged in the chemical trade and to workers in industry. The scope of the book is so broad, however, that it will prove invaluable to all whose work brings them into contact with any branch

of chemistry, while the accuracy and completeness of the information provided are such that chemists themselves will find the book a useful addition to their reference libraries. Necessarily in a book of this scope, sections of information indispensable to one group of users will prove of little value to others. The inclusion of trade names may be invaluable for the industrialist but is scarcely warranted from the viewpoint of the researcher, considering the large amount of space that they require. Users in the latter group will, however, be pleased to find liberal references to reviews and texts where further information may be obtained, and frequently also to the original literature.

The third edition has been brought up to date (first volume to mid-1952, second to the end of 1952), and the additional information has been included without any increase in bulk over the preceding edition by resorting to the use of abbreviations. These, however, are not extensive and can be interpreted easily without repeated reference to the key provided. The excellent printing and format of the book remain unchanged, strict adherence to alphabetical listing of the items having been maintained. The encyclopedia is carefully cross-referenced, and location of the desired information is rapid and easy.

Although the coverage of less common chemical compounds is not as complete as in dictionaries and handbooks of more limited scope, *Chemie Lexikon* records a comprehensive range of substances related to all branches of chemistry and neighboring fields, such as foodstuffs, dyes, drugs, metallurgy, geology, and biology. Physical and chemical properties, preparative methods, uses, sources of supply, and in some cases prices are reported. Terms, reactions, theories, and laws are carefully explained. Information on modern chemical knowledge and practices, biographies of noted scientists, statistics on the chemical industry throughout the world, and a host of other subjects are covered. Descriptions of apparatus are usually accompanied by an illustration, and structural formulas of chemical compounds are given. The user with a limited knowledge of the German language will find no difficulty in understanding the clear and simple style of the author.

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Textbook of Physiology and Biochemistry. 2nd ed. George H. Bell, J. Norman Davidson, and Harold Scarborough. Livingstone, Edinburgh–London; Williams & Wilkins, Baltimore, Md., 1953. 1002 pp. Illus. + plates. $10.

This textbook first appeared in 1950 and has been well received in the British Isles, for whose medical and dental students it was written. Dr. Bell is professor of physiology in the University of St. Andrews, Dr. Davidson is professor of physiological chemistry in the University of Glasgow, and Dr. Scarborough is professor of medicine in the University of Wales. Coming from three different disciplines, these authors have produced a well-integrated volume, with a lucid style and straightforward argument, in which enough clinical material is incorporated to point the reader toward applications in the wards.

The second edition is somewhat longer than the first, but there has been little change in organization of the text and almost none in the illustrations. The figures are well chosen, many from classical sources, some newly drawn, and are reproduced with clarity, many appearing as halftones. References at the ends of chapters have been more than doubled, mainly by the inclusion of new papers and monographs published during the last 3 years. Nevertheless, the authors show a certain conservatism in their choice of material, and a number of recent advances have not been treated.

This book may be described as basically a text in physiology, with somewhat more than the usual attention paid to biochemistry. It is hardly adequate to serve the needs of the courses in biochemistry now given in American medical schools. It should be found acceptable as a text in some physiology courses, since the treatment is somewhat simpler than that used in most of the great tomes currently imposed upon American medical students, the majority of whom begin the study of the subject with very little background. The authors have certainly developed an interesting and easily read volume that should he helpful to many students, including seniors in arts and science schools who have had some previous training in the field.

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The Major Features of Evolution. George Gaylord Simpson. Columbia Univ. Press, New York, 1953. 434 pp. Illus. $7.50.

Dr. Simpson's new book is an outgrowth of his well-known earlier work, *Tempo and Mode in Evolution,* and contains the essential material of the earlier volume in a greatly expanded form. It is, therefore, the outstanding and, in fact, the only work that integrates the mass of paleontological data with the latest information from genetics to synthesize general principles about the course of evolution and the causal factors that underlie evolutionary change. For this reason, it should be on the must list for all scientists seriously interested in understanding evolution.

The book is built around the same basic topics as was *Tempo and Mode.* The same type of factual material is used for illustration—chiefly the fossil record of vertebrate animals, with some evidence from invertebrates. The data are again treated in a quantitative fashion, with statistical concepts playing a prominent role in the formulation of the general principles. The book is nevertheless free from statistical formulas and thus quite readable for those without much knowledge of statistics.

In this new work one finds a much larger body of factual material, and a fuller discussion of the ex-