Geological Correlations

Geochronology in Canada. F. Fitz Osborne, Ed. Published in cooperation with the Royal Society of Canada, Ottawa, by the University of Toronto Press, Toronto, 1964. x + 156 pp. Illus. $5.95.

This volume contains nine papers presented at a colloquium of the Geology Division, Section 3, of the Royal Society of Canada at its annual meeting in Quebec during June 1963; there is also a short introduction by F. Fitz Osborne. A more appropriate title would be "Geological Correlations in Canada." In addition to radiometric age determinations, commonly implied (in the United States) by the term geochronology, paleontologic, stratigraphic, and paleomagnetic methods are covered.

Fossils are discussed by F. K. North and by D. L. Dineley; paleomagnetic correlations, by L. W. Morley and A. Larochelle; stratigraphic methods applied to Devonian sediments in Western Canada, by R. de Wit.

In "Limitations of radiometric dating," H. Baadsgaard, G. L. Cumming, R. E. Folinsbee, and J. D. Godfrey cope with difficulties in the potassium-argon method in a satisfactory manner but less so with the rubidium-strontium and uranium-lead methods. Examples from their work range from Precambrian to Pleistocene. Potentially of considerable interest, but only briefly developed, is a study of the Precambrian gneiss complex in the Andrew Lake area in northeastern Alberta in which all three methods were utilized.

The progress of geologic correlations in the Appalachian region of Canada is expertly summarized by W. H. Poole, D. G. Kelley, and E. R. W. Neale. The lack of radiometric dating programs devised for the problems is a handicap.

H. Gabrielse and J. E. Reesor develop a chronology for the plutonic rocks in two areas of the Canadian Cordillera. A regard for the limitations of potassium-argon mica ages is shown, and stratigraphic control is used effectively.

C. H. Stockwell presents a potassium-argon time scale for the Precambrian rocks of Canada. One can only voice the fervent hope that the limitations of potassium-argon age determinations will be more carefully considered and that much deliberation will precede formalizing of such a time scale.

The paper, entitled "Notes on the Pleistocene time-scale in Canada," by A. Dreimanis, is a bright spot. Canadian problems are presented in a concise and scholarly review of Pleistocene research which has expanded at an unprecedented rate.

Geochronology in Canada will be useful to geologists interested in Canadian geology. It suggests that geochronology (radiometric) is progressing, but slowly. Perhaps advances are being stifled by insistence on adherence to some sort of "unifying concept" of geology which we are assured is not an "exact science." Like its predecessors in this series, *Special Publications of the Royal Society of Canada,* this volume is well edited and attractively printed.

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Chemical Analysis

IR: Theory and Practice of Infrared Spectroscopy. Herman A. Szymanski. Plenum Press, New York, 1964. xiv + 375 pp. Illus. $15.

For many years there were not enough books on applications of infrared absorption spectroscopy to problems of chemical interest, particularly chemical analysis. Within the last few years this situation has been radically changed, and there is now a rather wide selection of books in this field. It follows that a new book on infrared spectroscopy must meet the test of this question, "Is it better than those already available?" I reluctantly conclude that in this case the answer is "No."

A brief introduction precedes N. L. Alpert's 50-page chapter on instrumentation, which is one of the better features of the book. The components of infrared spectrophotometers are discussed systematically, and their limitations are pointed out. No attempt is made to describe the details of commercial instruments, but criteria of instrument performance are considered.

Although much useful information is presented in the next chapter, "Laboratory techniques and preparation of sample" (30 pages), the descriptions of several techniques are inadequate, if the reader is a beginner, and the organization of the chapter is poor.

It is difficult to determine for whom the chapter entitled "Theoretical considerations in infrared spectroscopy" (107 pages) was written. If the reader is interested in analytical applications of infrared spectroscopy, much of the details in this chapter could well be omitted. If, on the other hand, the reader is interested in the determination of molecular parameters and the interpretation of the details of high-resolution spectra, he will not find this chapter particularly helpful. The treatment of normal vibrations is quite inadequate. The discussion is mostly descriptive, and a number of imprecise or misleading statements can be found.

The next chapter, "The use of characteristic group frequencies in structural analysis" (110 pages), is much better. Group frequencies and their relation to normal vibrations are discussed, and the characteristic frequencies of hydrocarbon groups are given a detailed treatment, with numerous examples. This is followed by a briefer discussion, partly in tabular form, of other kinds of groups.

The chapter on quantitative analysis (31 pages) is superficial and poorly organized. For example, Beers' Law is "pulled out the hat," and nothing is said about the optimum absorbance range. The final chapter, "The spectral library" (15 pages), contains useful information on publications, catalogs of spectra, and coding and retrieval systems currently in use. A pocket in the back cover contains 16 typical spectra in a full-sized format.

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Aerosol Mechanics

The Mechanics of Aerosols. N. A. Fuchs. Translated from the Russian edition (Moscow) by R. E. Daisley and Marina Fuchs. C. N. Davies, Ed. Pergamon, London; Macmillan, New York, 1964. xiv + 408 pp. Illus. $17.50.

This is a revised and enlarged edition of a book first published in Russia in 1955. Some readers will be familiar with a translation of the 1955 edition which was done by the U.S. Army Chemical Warfare Laboratories in 1958. The latter edition, despite numerous shortcomings of translation and format, was welcomed by workers in

a broad range of fields in which aerosols play a role. The present edition is an entirely new and superior translation done by R. E. Daisley and Marina Fuchs under supervision of C. N. Davies. In preparing this revision, the author has added much new material throughout the book, bringing it up to date as of 1960 and increasing by over 50 percent the total number of useful bibliographical references.

For those who are not familiar with the 1958 translation, it may be briefly noted that Fuchs has assembled and critically evaluated almost all that is known about aerosol "mechanics." He gives a very detailed treatment of the dynamics of motion of aerosol particles and discusses in definitive manner such topics as Brownian motion, diffusion, coagulation, and dispersion of aerosols. The great value of the book is that it not only brings non-Russian readers into touch with the extensive Russian work in the field of aerosol physics, but also gives them the considerable benefit of Fuchs' expert discussions of all important work done in this field throughout the world. Both basic principles and scientific and industrial applications are treated. The author and his translators deserve high praise for their work.

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Geography

Africa and the Islands. R. J. Harrison Church, John I. Clarke, P. J. H. Clarke, and H. J. R. Henderson. Longmans, Green, London; Wiley, New York, 1964. xvi + 496 pp. Illus. $9.75.

Africa: A Study in Tropical Development. L. Dudley Stamp. Wiley, New York, ed. 2, 1964. x + 534 pp. Illus. $10.95.

Until this past year there was a paucity of college textbooks dealing with the geography of Africa. Recently, however, the importunings of the publishers' representatives appear to have been answered and, from a market view, possibly answered too well. Three new books have been published, and one of the two standard texts has been revised.

All of the authors of *Africa and the Islands* have had teaching and research experience in Africa. Harrison Church, the senior author, contributed the chapters that deal with former French West and Equatorial Africa and with Portuguese Africa. John I. Clarke wrote the chapters on north and northeast Africa. P. J. H. Clarke covered East Africa and H. J. R. Henderson southern Africa.

There is an introductory section, about a quarter of the book, which deals with the history, physical background, peoples, and modes of life of the continent. These and other topics are explored in greater detail in the chapters on specific countries.

Throughout the book human settlement and economic activities in Africa are emphasized. Settlement by Africans, Asians, and Europeans is treated, with appropriate emphasis on each. The often startling juxtaposition, which one can see in Africa, of subsistence activities with sophisticated cash-crop agriculture, or with manufacturing, is reflected. Much of the material mined from professional journals and from the first-hand research of the authors has not previously appeared in textbooks. Its inclusion is helpful. In this respect, the chapters by John I. Clarke have special merit.

The authors demonstrate a familiarity with the areas about which they have written, and with the professional literature concerning these areas. The result is a work with depth, a basic requisite of a sound textbook.

Dudley Stamp's *Africa: A Study in Tropical Development* was first published in 1953 and has been a useful textbook for a decade. One of its merits has been the emphasis placed on problems of human settlement in tropical Africa. There is discussion of subtleties of tropical climate and soils, of diseases of man and livestock, and of transport. This occupies a third of the book; the remainder is the customary country by country description and discussion.

The format of the second edition is slightly larger than that of the first, the printing of the photographic illustrations is better, and the text is remarkably little changed. Bibliographies have been updated, and the changes made necessary by the altered political status of nations has been added to existing chapters. There is a short additional chapter entitled "Africa and the world," which actually is concerned with Africa and world trade.

Some materials archaic at the time of the first edition and some errors of fact have been carried over unchanged into the new edition. The stations used to illustrate the different climatic regions were very carelessly chosen—Alexandria, Egypt, is in no sense in a tropical savanna area and Nairobi, Kenya, is not properly a tropical rain forest station (as Stamp will well remember if he has ever spent a chilling August or September in Nairobi). This new edition is useful, even though the opportunities offered by revision were not utilized.

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New Books

Mathematics, Physical Sciences, and Engineering

Advances in Inorganic Chemistry and Radiochemistry. vol. 6. H. J. Emeléus and A. G. Sharpe, Eds. Academic Press, New York, 1964. 542 pp. Illus. $16. Eight papers: "Complexes of the transition metals with phosphines, arsines, and stibines" by G. Booth; "Anhydrous metal nitrates" by C. C. Addison and N. Logan; "Chemical reactions in electric discharges" by Adli S. Kana'an and John L. Margrave; "The chemistry of astatine" by A. H. W. Aten, Jr.; "The chemistry of silicon-nitrogen compounds" by U. Wannagat; "Peroxy compounds of transition metals" by J. A. Connor and E. A. V. Ebsworth; "The direct synthesis of organosilicon compounds" by J. J. Zuckerman, and "The Mössbauer effect and its application in chemistry" by E. Fluck.

Advances in Petroleum Chemistry and Refining. vol. 9. John J. McKetta, Jr., Ed. Interscience (Wiley), New York, 1964. 455 pp. Illus. $20. Eight papers: "Advances in large-scale oxygen production" by R. L. Shaner and L. C. Matsch; "Hydrodealkylation" by G. F. Asselin; "Formulation and structure of lubricating greases" by B. W. Hotten; "Thermal cracking of pure saturated hydrocarbons" by B. M. Fabuss, J. O. Smith, and C. N. Satterfield; "The new elastomers" by W. W. Crouch and R. S. Hammer; "Mechanisms of carbonium ion, carbene, and carbanion reactions" by George M. Kramer and Thomas J. Wallace; "Synthetic ammonia" by S. Strelzoff and L. C. Pan; and "Chemistry of fuel instability" by Thomas J. Wallace.

Chemistry and Physics of Polycarbonates. Hermann Schnell. Interscience (Wiley), New York, 1964. 237 pp. Illus. $12.75.

The Chemistry of Complex Cyanides. A literature survey. M. H. Ford-Smith. Her Majesty's Stationery Office, London, 1964 (order from British Information Services, New York). 99 pp. Illus. $5.50.

Chromatographic Reviews. Progress in chromatography, electrophoresis, and related methods. vol. 6. Michael Lederer. Elsevier, New York, 1964. 227 pp. Illus. $12.75. Eight papers: "Commercial equip-

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