

enlarge on them, and he makes only a very brief reference to the work of Sir William Thomson (Lord Kelvin), who, shortly after the publication of the *Origin of Species*, attempted to solve the problem by means of astronomical and physical data. The story of his intervention, the concern it caused among biologists, particularly Darwin, and among geologists, too, and the revolutionary effect the discovery of radioactivity had on the resolution of the problem, leading, as it did, to an entirely new method of calculating the Earth's age, is an interesting one. It would have rounded off Prof. Haber's story in a very satisfactory way if he had continued it in rather more detail to the time when the new radioactive methods of determining the age of the Earth were first used, some fifty years ago. This criticism apart, he has written an extremely interesting book, which is not just a record of isolated opinions, events and discoveries but a continuous narrative of the development of ideas on his subject. There is no bibliography, but extensive footnotes provide a valuable guide to source material.

V. A. EYLES

<sup>1</sup> *Phil. Trans. Roy. Soc.*, 29, 296 (1715).

<sup>2</sup> De Buffon, G. L. L., in *Histoire Naturelle*, 1, 65 (1749).

<sup>3</sup> The advertisement occurs in a copy of J. J. Berzelius' *Mineralogy*, translated by J. Black, London, 1814, in the possession of the reviewer.

<sup>4</sup> First published as Supplément 5 to Buffon's *Histoire Naturelle* (1778). Preliminary results of the experiments were published in Suppléments 1 and 2 (1774) of the *Histoire Naturelle*.

## GEOPHYSICAL METHODS

### Methods and Techniques in Geophysics

Vol. 1. Edited by Prof. S. K. Runcorn. Pp. ix + 374. (New York: Interscience Publishers, Inc.; London: Interscience Publishers, Ltd., 1960.) 10 dollars; 72s.

MANY books and review articles have been written which are concerned with the observational data of geophysics and the deductions from them; Prof. S. K. Runcorn's aim in presenting this book is to provide a comparable account of the methods and techniques which are used to obtain the observations, which will be useful to those who wish to start a particular type of experimental work and to those who wish to evaluate critically the methods and the results.

It contains accounts of the techniques used in a variety of investigations: there are two articles on heat-flow, one by Sir Edward Bullard and the other by A. D. Misener and A. E. Beck; articles on borehole surveying by T. F. Gaskell and P. Threadgold; the geomagnetic elements by K. Whitham; palaeomagnetism by D. W. Collinson and K. M. Creer; gravity at sea by J. C. Harrison; earth movements by P. L. Willmore; earth currents by G. D. Garland; the properties of rocks under high pressure and temperature by D. S. Hughes; and the secular motion of the pole by W. Markowitz.

The accounts are good, and admirably fulfil their purpose; obviously, it is not possible to give a complete account of all the experimental techniques involved in every type of measurement, but the general principles and sufficient practical

details and difficulties are related, and quite detailed references have been given. The measurement of heat-flow is an important geophysical technique and this has been recognized by two articles on it. Harrison's account of the measurement of gravity at sea includes an account of the cross-coupling effect, and points out that in the case of a beam-gravimeter stabilized along the true vertical the error due to it in an extreme case could be as high as 500 mgals; in actual operation, however, the error with the Graf instrument can be maintained less than 15 mgals and a correction can of course be made for it. The errors involved in gravity at sea are still essentially navigational.

The article on measurements in palaeomagnetism shows a curious balance in that so much is concerned with the astatic magnetometer. It might perhaps be argued that the original papers in which the instrument was described are not easy to obtain, and that it is the fundamental instrument used in the study of rock magnetism; nevertheless, it is curious that there is no account of the effects of pressure on the magnetic properties of rocks, or an account of alternating-current bridge methods of measuring susceptibility.

These criticisms are trifling, however; this is an excellent book and is well produced. It is bound to be of use to many geologists and geophysicists.

M. J. KEEN

## POLYSACCHARIDES OF MICRO-ORGANISMS

### Polysaccharides of Micro-Organisms

By Prof. M. Stacey and Dr. S. A. Barker. Pp. vii + 228 + 8 plates. (Oxford: Clarendon Press; London: Oxford University Press, 1960.) 30s. net.

IT was a courageous undertaking on the part of Prof. Stacey and Dr. Barker to attempt to review the extensive field of microbiological polysaccharides in one small volume of more than 200 pages. They have, however, achieved this task, and have produced an elegant little book which is both up to date and readable, and will be much appreciated and enjoyed by those who already have a good grounding in carbohydrate chemistry.

Early in the book there is a short account of carbohydrate nomenclature and conformation, which is followed by a brief description of the various monosaccharide components encountered and their biosynthesis. There follows an account of the structural components of cells, of the function of capsular and cell-wall polysaccharides and of biological activity; and, in an attempt to appeal to the non-specialist reader, the authors have included two chapters in which the older (classical) and modern approaches to the isolation, purification and structural analysis of polysaccharides are given. These chapters are of necessity concise, but are timely in that they emphasize the value and importance of employing the results of physical, chemical and serological measurements to establish the homogeneity, or more correctly, the lack of demonstrable heterogeneity, of the materials under investigation. The establishment of the suitability