Book Reviews

A Daring Geology and Cosmogony

Telliamed. Or Conversations between an Indian Philosopher and a French Missionary on the Diminution of the Sea. BENOÎT DE MAILLET. Translated from the French and edited by ALBERT V. CAROZZI. University of Illinois Press, Urbana, 1968. xiv + 466 pp., illus. $10.

The *Telliamed* scandalized the orthodox and even aroused strong opposition from the not so orthodox when it appeared in 1748. Benoît de Maillet's critics were repelled by the materialistic cosmogony which was quite apparent throughout the work in spite of the efforts of his editor and literary executor, the Abbé Jean-Baptiste le Mascrier, to soften its heterodoxy. Thanks to the attacks of its critics, the *Telliamed* received extensive publicity and was widely read. For nearly a century it stimulated debates and influenced men of far greater ability than its author. The *Telliamed* begins as a treatise on geology, but it concludes with a remarkable discussion of the origins of the earth and stars and a hypothesis concerning the appearance and transformation of terrestrial life. The work is in the form of three conversations between a French missionary and an Indian sage who proposes de Maillet's heretical ideas. The geological system presented in the first two conversations attempts to explain virtually all of the earth's physiographic and structural characteristics as the results of the action and gradual diminution of the seas. Each of these conversations contains an array of detailed observations supporting plausible inductive generalizations. The third conversation, however, is quite different in both character and content. It contains a cosmogony based upon Cartesian vortices, the plurality of worlds, and a series of cyclical cosmic changes through which celestial bodies pass from stars to globes completely covered by water, to habitable planets, and back to stars. It also presents de Maillet's arguments for the aquatic origin of all life including man and for the transformation of living forms from aquatic to terrestrial habitation. The speculative nature of the third conversation has tended to overshadow the more careful but only slightly less dramatic geological hypotheses of the other two. Carozzi has done much to restore a needed balance in treating the *Telliamed* as more than merely a forerunner of Buffon, Lamarck, and Darwin.

The *Telliamed* appeared in three French editions between 1748 and 1755, all of which contain modifications by Le Mascrier and perhaps by other editors. (De Maillet died ten years before the first edition was published.) An English translation of the first edition appeared two years later (1750) and was reprinted with few changes in the United States in 1797. Until now, no subsequent English edition has appeared. Carozzi has attempted more, however, than merely to provide a modern translation of the published text. By examining the existing manuscript copies of the *Telliamed*, he has sought to re-create de Maillet's original text and to isolate the later additions of Le Mascrier and the other unidentified editors. The present translation is based upon a manuscript of 1728 which presumably is entirely the work of de Maillet, but it also includes the later additions of de Maillet, Le Mascrier, and others as footnotes which can be interpolated into the text. It is thus a valuable addition to the literature on 18th-century geology.

Carozzi's extensive footnotes prove to be a mixed blessing. He has taken great pains to identify and expand upon de Maillet's frequently obscure bibliographic references. Furthermore, he and his colleagues have reexamined the geological formations mentioned by de Maillet and have shown him to have been an extremely acute and accurate observer. Unfortunately, however, the footnotes too often emphasize the seemingly modern aspects of de Maillet's ideas, a practice which can too easily lead to a distortion of their historical context. The concern with verifying de Maillet's observations, while providing many valuable insights into what he observed and the conclusions he drew, has led also to many unnecessary footnotes. In the midst of this wealth of obviously careful scholarship it is disconcerting, even irritating, frequently to turn to the back of the book only to find: "Note these very clever processes for . . .," "Notice the correct observation that . . .," or "Notice the correct interpretation of . . . ."

Not having access to Carozzi's manuscript, I cannot judge the accuracy of his translation, but his ability as a translator has already been amply demonstrated. The present translation is certainly very readable and, I believe, true to the spirit of the work. If some of the explanatory footnotes need to be treated with caution, they nonetheless provide much interesting and valuable information.

JOE D. BURCHFIELD
Department of History,
Northern Illinois University, De Kalb

Changes in the Land

The Mediterranean Valleys. Geological Changes in Historical Times. CLAUDIO VITA-FINZI. Cambridge University Press, New York, 1969. x + 140 pp. + plates. $13.

The questions of historical soil erosion in the Mediterranean lands have been the subject of lively debate since classical times, and man's diverse forms of occupance have been repeatedly blamed for a general deterioration of land resources. Vita-Finzi has investigated these charges by studying the field evidence of the stream deposits themselves and their dating. He marshals substantial evidence for northern Tripolitania (38 pp.), with very brief and often casual consideration of other parts of North Africa, Jordan, Greece, Italy, and southern Spain. Vita-Finzi shows that during late Roman or early Medieval times many of the streams of the Mediterranean Basin were subject to a significant change of geomorphologic equilibrium: vertical cutting of older alluvial fill gave way to alluviation in the lower stream courses. As a result, longitudinal stream profiles have been steepened and smoothened, while broad tracts of loamy agricultural soils were created along the valley

floors by silt-laden floods. In recent centuries these "post-Classical alluvia" have once again been subject to dissection. A similar cycle is identified for the late Pleistocene, with aggradation of somewhat coarser, less sorted and less stratified "older fill" from the stream headwaters to the coast. Whereas the "older fill" is attributed to a greater incidence of frost-weathering as well as to a seasonal incidence of more intensive rains, the "post-Classical fill" is thought to reflect vague and ill-defined climatic factors affecting the whole Mediterranean Basin simultaneously. Changes of land use, gradual or repeated devegetation, and other human influences are discounted or relegated to secondary and local significance.

Examined in detail, the field evidence is seldom adequate to support the bold generalizations and hypotheses put forward. Only a few examples can be cited here. The "older fill" is not universally contemporary, nor do these alluvia represent the total time-span of the Last Glacial anywhere in the Mediterranean Basin: all models of aggradation and downcutting aside, the actual events recorded in Provence (E. Bonifay), Mallorca (K. W. Butzer and J. Cuerda), eastern Algeria (J. Hilly), Latium and Tuscany (A. C. Blanc and others), the coastal plain of Israel (M. Pfannenstiel and others), Egypt (Butzer and C. L. Hansen), and elsewhere are incredibly complex. The Last Interglacial beaches of the Mediterranean, now partly dated by thorium-uranium (C. E. Stearns and D. L. Thurber), seldom include *Strombus bubonius* but rather have an impoverished, thermophile fauna (Bonifay and P. Mars, Butzer and Cuerda). Increased frost-weathering is not synonymous with periglacial weathering. Isolated stone artifacts can almost never be linked with specific lithic industries and therefore cannot be used to date alluvia. These comments serve to show why this reviewer is disappointed by the treatment of the older fills. Vita-Finzi's treatment of post-Classical alluvia stands up rather better: the data were all gathered personally, and the author's familiarity with classical archeology stands him in good stead. But valley alluvia are considered with little attention to colluvial deposits and the complex of slope processes; interactions of vegetation mat, soil properties, and denudational forces are neglected at the specific level; and interpretations are not based on sedimentological studies. The value of Vita-Finzi's monograph lies in the wealth of field data it brings together, and the fascinating problems it poses: the real answers must await many more local studies of the depth and detail of Vita-Finzi's own Tripolitanian work.

KARL W. BUTZER
Departments of Anthropology and Geography, University of Chicago, Chicago, Illinois

The Science of Landforms

The Encyclopedia of Geomorphology. RHODES W. FAIRBRIDGE, Ed. Reinhold, New York, 1968. xvi + 1296 pp., illus. $38.50. Encyclopedia of Earth Sciences Series, vol. 3.

Geomorphology is a subject that links with many others while covering a wide field itself. Landscape, the raw material of geomorphology, is ubiquitous and the study of it is worldwide. It is therefore of particular interest and value to have assembled inside one cover the views of about 150 geomorphologists, who together discuss a very wide range of topics and represent a great variety of views, based on the study of landforms all over the world. Fairbridge has himself undertaken a major part of the work, contributing nearly 100 of the 410 articles. He is to be congratulated on assembling in this reference work so much information of interest to geomorphologists. The cross-reference system is very necessary and helpful in connecting articles on similar topics that are widely scattered throughout the book. There is also a detailed index.

In order to assess the balance of coverage of several major geomorphological topics, this reviewer followed these topics through the entries in which they arise throughout the volume. The result provided a great variety of viewpoints and of emphasis. There are some inconsistencies and several repetitions, but these are more than counterbalanced by the interest of different approaches and the range of examples cited. Nearly all of the articles are illustrated by clear line diagrams and maps, although some of these are printed too small. Again there is some repetition. There are also many photographs, most of which are of a high standard and add substantially to the value of the book. Each article is followed by a list of up-to-date references.

All fields of geomorphology are covered, and there is a very interesting set of articles on the philosophy and nature of geomorphology, including articles on general systems theory in geomorphology, geomorphological maps, and principles of geomorphology. The articles are not restricted to analysis of morphology but also include the stratigraphic or chronological approach to geomorphology. The article on the Quaternary period, by the editor, is particularly noteworthy in this respect. It is balanced by one on glacial geology and many others that deal with the development of glacial landforms.

One will have to go, however, to *The Encyclopedia of Applied Geology and Sedimentology*, which will be volume 6 in the series, to find articles on glaciology, glaciers, and glacier geophysics. This subdivision of the material in the different volumes is unfortunate, but inevitable in view of the great range of studies relevant to geomorphology. The earth sciences will eventually be covered in eight volumes, of which the present one—the latest published so far—is the third. Thus geomorphology takes its place here alongside geology, geophysics, and oceanography. The only concession in the volume to its links with geography, which are much stronger in Europe than in the United States, is an article entitled "Geography: concept, growth, and status." That geomorphology can stand as a science in its own right, however, is amply demonstrated by the vast amount of work which has been devoted to it and which is so ably displayed in all its variety by the geomorphologists who have contributed to this very useful encyclopedia.

CUCHLAINE A. M. KING
University of Nottingham, Nottingham, England

Pathogens

Viruses in Plant Hosts. Form, Distribution, and Pathologic Effects. KATHERINE ESAU. University of Wisconsin Press, Madison, 1968. xii + 228 pp., illus. $10. The 1968 John Charles Walker Lectures.

This book represents the substance of a series of three lectures its author presented at the University of Wisconsin in 1968. With the aid of a great many elegant electron micrographs of sectioned plant tissues infected either with beet yellows virus (which is confined largely to phloem) or with tobacco mosaic virus (which is found in nearly all cell types of the plant), she provides