

phytogeographic patterns. The time slices used by Raymond, Parker, and Barrett are somewhat broad in this context. Additionally, early Devonian plant data are sparse, with the result that large geographic areas (for example the "west coast of Laurussia") are characterized by single assemblages of only two genera. A more graphic illustration of the power of the techniques is presented in the paper by Raymond, Parker, and Parrish, but the volume as a whole could have benefited from a Mesozoic example with a larger data set, more reliably known paleogeography, and a more diverse flora.

The paper by DiMichele, Phillips, and Peppers discussing the influence of climate and depositional environments on Pennsylvanian coal-swamp plants presents an informative overview of coal-swamp plant biology. I am not sure that I agree entirely with the argument that because coal swamps represent edaphic islands they are *excellent* indicators of general climate trends. After all, their existence is dependent to a large extent upon topography and local geology, and they must have created their own microclimates.

The final paper by Cope and Chaloner discusses the occurrence of wildfire in a biological and geological context.

I would have liked to see a more balanced, less "inbred," volume. Nevertheless this is an exciting collection of papers that ought to be read widely and encourage further interdisciplinary research.

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Poliovirus

The Molecular Biology of Poliovirus. FRIEDRICH KOCH AND GEBHARD KOCH. Springer-Verlag, New York, 1985. xvi, 591 pp., illus. \$74.

The tiny virus that causes poliomyelitis has been intensively studied in the laboratory for 30 years. Today, the fundamental principles concerning the structure and replication of poliovirus are well understood, and the next decade or two can be expected to yield answers to the remaining questions.

The Molecular Biology of Poliovirus is an attempt to provide a scholarly and complete description and analysis of research on all aspects of this virus. The book is far more than a textbook survey. Most of it is devoted to the more recent developments in the field, presented as logical extensions of previous work. The book includes thoughtful

interpretations and speculations by the authors.

The book contains 11 chapters divided into two sections, the first of which deals with the virus particle and its RNA and protein components. Although the book was published before the complete atomic structure of the poliovirus particle was announced (in September 1985), it presents all of the basic principles and most of the final lessons, and it provides all of the background necessary to understand new publications. A chapter on the structure and function of the genome is especially well synthesized, with critical analyses of discrepancies and other inadequacies in the literature. Although a uniform nomenclature for all poliovirus proteins based on genome map coordinates was adopted at a meeting of the European picornavirus study group in 1983, the authors do not utilize it in most of the book. This is unfortunate, since subsequent usage of the new nomenclature has made the old difficult to follow, especially for younger workers.

The second section of the book deals with the steps in the replication of the virus. These include the early interactions of the virus with the host cell, the accompanying morphological alterations of the host cell, the translation of the viral genome, the replication of the viral RNA, assembly of the virion, and morphogenesis. Every effort appears to have been made to make each chapter a self-contained, high-quality, and up-to-date review. The section begins with an introductory chapter that contains a number of useful tables that list biochemical constituents and measurements of the Hela cell and essential background information that is hard to find in other sources. Similarly, the chapter on translation of viral proteins contains a concise but useful summary of initiation factors and of mechanisms for the synthesis of cellular proteins that serves as a basis for comparison and examination of systems for the control of viral translation. By ending with the authors' speculations on the functions of intracellular compartmentalization, the otherwise purely descriptive chapter on the morphological alterations of the host cell is made thought-provoking. Despite the book's appropriate concern with the host cell as an introduction to virus replication events, it does not deal with pathogenesis or virus-host interactions at the tissue (neurovirulence) or organism (immune response) levels.

Progress in this field has been extremely rapid in recent years. Considering that the authors' literature survey must have terminated some time in 1983, it is to their great credit that the book contains almost no wrong information. The coverage of a few

subjects has been outdated by recent findings, but in most of these cases there are hints that allow the reader to predict the new results. It is a tribute to the scholarship of the authors that some of their prophecies have already been proved correct. For example, protein 2A had not been identified as a second viral protease at the time the book was written, but the authors predict the existence of a second protease, encoded somewhere on the viral genome. The final chapter, entitled "Conclusions," lists the still unanswered questions concerning poliovirus. One appendix contains a list of laboratories currently working in the field, and another includes directions for building poliovirus models out of paper or an apple. A 12-page appendix deals with the geometry of isometric particles, and the complete nucleotide and amino acid sequences of all three serotypes of poliovirus are tabulated in a final appendix. The reference list is extraordinarily complete. *The Molecular Biology of Poliovirus* is highly recommended for students of poliovirus and related viruses as well as for those already involved in the field.

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Weathering Processes

The Chemistry of Weathering. JAMES IRVING DREVER, Ed. Reidel, Dordrecht, 1985 (U.S. distributor, Kluwer, Hingham, MA). viii, 324 pp., illus. \$44. NATO Advanced Science Institutes Series C, vol. 149. From a workshop, Rodez, France, July 1984.

This collection of 17 papers has the diversity and scope to make it a suitable introduction for the nonspecialist interested in an overview of current geochemical research on weathering. Indeed, its scope is such that the specialist will find topics and perspectives that he or she may not have encountered. The papers, in rough order of presentation, cover thermodynamic models, laboratory dissolution experiments, and field studies covering the scale from individual soil profiles to continental watersheds. Some of the contributions, although interesting case studies, are somewhat narrowly focused, and I will only discuss those that have wider application.

The opening papers, by Sposito and Fritz, address two problems that complicate the modeling of weathering processes. The first is that some secondary clays, such as kaolin-