

vironmental setting when the cave filling was deposited. Brain concludes that the majority of the Kromdraai bone fragments represent the food remains of hominid hunters.

Also of interest are the final papers of the paleoanthropology volume, by Vlček describing a burial from the Crimean site of Kiik-Koba of a Neandertal infant, which at the estimated age of death of five to seven months is perhaps the youngest fossil hominid to be excavated, and by Kolossov, Kharitonov, and Yakimov describing the Neandertal remains from another Crimean site, Zaskalnaya VI.

In the primate studies volume, particular mention should be made of the paper by Walker and Murray on the differences between colobine and cercopithecine monkey bilophodont molars. The paper stresses the relationship of these differences to the ability of colobine molars to cut leafy food materials more efficiently into smaller pieces, as measured primarily by an examination of stomach contents of shot wild specimens. The authors offer convincing evidence that purely metrical analyses of the dentition of fossil primates may not be sufficient to identify adaptive differences in otherwise similar forms.

It is unfortunate that at approximately the same time this congress was convening in Chicago another meeting was being held in Nairobi that drew many paleoanthropologists who might otherwise have gone to Chicago, for there is virtually nothing in these volumes about the evolution of Pliocene-early Pleistocene hominids in East Africa.

Some of the papers could have been improved if more reference were made to other presentations in the volumes. For example, Eckhardt's paper, a well-reasoned argument for regarding *Gigantopithecus*, instead of *Ramapithecus*, as the earliest hominid, deals with the Indian *Gigantopithecus bilaspurensis* as dated from the Dhok Pathan zone in northern India, some 5 to 9 million years old. This dating represents a major problem in his presentation. In an earlier paper, Khatri reports that the mandible was not found in situ, but had been discovered by a peasant who kept it in his house until he sold it. Khatri wonders "how anyone can be sure of its geological horizon."

Finally, it would have been very helpful if the times for the Miocene, Pliocene, and Pleistocene in the papers in both volumes had been modified to reflect recent changes in the definitions of these epochs. Papers in both volumes mention these changes, and a detailed

and comprehensive chart is provided at the end of Delson's paper in the primate studies volume, but there is little consistency in the use of these terms from paper to paper.

In summary, although new discoveries and reinterpretations of older finds and dates have caused much of what is said in these books to be outdated, the books do focus on current problems in primate anatomy and evolution and paleoanthropology, offering the considered views of many of the major researchers in these fields. They will be a worthwhile investment for readers who have professional interest in the subjects they deal with.

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## Fossil Plant Assemblages

**Paleoecology of Terrestrial Plants.** Basic Principles and Techniques. V. A. KRASILOV. Translated from the Russian edition (Vladivostok, 1972) by Hilary Hardin. Halsted (Wiley), New York, and Israel Program for Scientific Translations, Jerusalem, 1975. viii, 284 pp., illus. \$24.50.

Paleoecology, according to Krasilov, involves not only a systematic study of past life forms in combination with relevant geophysical and geochemical data, but also the development of paleoecological models consistent with information available from extant ecosystems. Krasilov presents a well-researched text that provides numerous examples of the usefulness of fossil plant assemblages (phytotaphocenoses) in paleoecological interpretations. Other books that have been published recently on the principles of paleoecology deal primarily with animals. Krasilov's is the first and only book devoted to principles and techniques of terrestrial plant paleoecology. It will have an important impact on this field in the Western world now that it is available in English.

It is important for students of evolution and sedimentology to be conversant with the principles of paleoecology. Krasilov's book supplies them with a detailed analysis of plant organs as sediments. Numerous depositional models and situations are described, though sometimes with little synthesis of the data presented.

Krasilov recognizes that in any aspect of paleoecology many factors influence the final conclusions drawn; sections of the three major parts of the book, Burial, Life Forms, and Vegetation, are care-

fully cross-referenced to illuminate the relationships among such factors. The portions of the book dealing with burial and vegetation will be the most useful to biostratigraphers and paleobotanists. Several examples of stratigraphic horizons bearing fossil plants are discussed in relation to the nature of burial, fossilization, and possible reworking of sediments. Descriptions of techniques for extracting information from fossil plant assemblages regarding paleosuccessions, paleoclimate, paleorelief, and the structure of past vegetation are provided and should be useful to students of paleoecology. In the section on life forms interesting aspects of the evolution of specific forms and functions of various plant organs are discussed in relation to the environmental pressures that may have influenced their development. The ecological settings for such major evolutionary events as the origin of land plants, the development of the seed habit, and the origins of major plant groups are discussed, though with the data available at present the role environments played in such events cannot be firmly established.

The broad survey this book provides of pertinent literature from all areas of the world (over 40 pages of references), naturally including work by many Russian authors, should be welcomed by English-reading scholars. It supplies important background information for an understanding of the various techniques for applying information from extant ecosystems to life forms and vegetational assemblages in the rock record. Because of the breadth of techniques covered, only selected techniques are discussed in detail.

Krasilov uses a variety of specialized ecological, botanical, and geological terms, and a glossary would have been helpful to many North American readers. The translation is well done and readable for the most part, though some of the idiomatic expressions used ("peter out," "fit the bill," "under the badge," and so forth) may cause a non-English-speaking reader problems. In correspondence and papers published in English the author transcribes his name Krassilov rather than Krasilov, as in this book. It is hoped that the difference in spelling will not be confusing to anyone. The half-tone illustrations are few and generally of poor quality; the line diagrams are better, but some graphs could be improved with more complete labeling.

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