This is the first major contribution to the systematics of these important tropical woodboring insects since the monograph of Chapuis, 1865, and the catalog and the *Genera Insectorum* generic classification of Strohmeyer, 1914. Because the family has increased fourfold since then this volume will be of great value to systematists, forest entomologists, and others concerned with locating and interpreting the voluminous taxonomic contributions of the author.

Schedl's species concept is entirely morphological; consequently, geographical races are treated either as synonyms or as species while sibling species and most morphological aberrations are listed as subspecies. Much synonymy is overlooked, for example the use of *Diacavus* Schedl, 1933, for *Genyocerus* Motschoulsky, 1858. There are numerous minor editorial errors, a confusing example being the inversion of diagram 2 on Abbildung 12. There is no reference whatever to the Coptonotinae, which are recognized by most workers as a subfamily of Platypodidae, nor is there a response to Crowson's reduction of the Platypodidae to a subfamily of Curculionidae. The introductory topics, particularly those treating geographical distribution, systematics, and phylogeny, are elementary and do not include material specialists in those fields might expect to find in a comprehensive taxonomic work.

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Biological Repair

Molecular and Cellular Repair Processes. A symposium, Baltimore, June 1971. ROLAND F. BEERS, JR., ROGER M. HERRIOTT, and R. CARMICHAEL TILGHMAN, Eds. Johns Hopkins University Press, Baltimore, 1972. xviii, 270 pp., illus. $17.50. Johns Hopkins Medical Journal, Supplement No. 1.

For the most part, the papers in this symposium volume concentrate on repair of DNA and involve various combinations of molecular studies on DNA itself and of studies of recovery of cells from injury, interpreted in terms of repair of this substance. However, one paper on recovery of cells from freezing injury interprets the results in terms of repair of membranes and reminds us that the cell may have other repair systems than those on which most attention is now concentrated.

The symposium brought together many of the most active workers in the field. It is clear that much progress has been made in the last few years. One repair system, photoenzymatic repair, has been developed to the stage where quantitative enzymatic kinetics is possible. Work with dark repair systems is still in the stage of identifying repair systems and enzymes. Several enzymes have been identified with some certainty, however, and work with these enzymes in vitro is becoming possible.

One of the problems in the field continues to be the difficulty of identifying and measuring quantitatively lesions in DNA and associating them with specific biological consequences. Quite a few papers in the symposium involve work with DNA strand breakage. One of the things that come out of reading these papers is the considerable diversity of opinion about the validity of the techniques for measuring such breaks and about their biological significance. Indeed, questions are raised about whether single strand breaks normally have any biological consequences at all.

Despite the emphasis on repair of DNA, very little is said about mutagenic consequences of repair processes. Only a paper on mutagenesis in the mouse deals principally with this topic. This is a difficult problem because of the rarity of the mutagenic event, and it is not surprising that most investigators concentrate on the more easily measured biological end points of cell killing and inactivation.

Altogether this book gives an excellent survey of the present activity in this important field.

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Fossil Proteins

The Biochemistry of Animal Fossils. RALPH W. G. WYCKOFF. Scientechnica, Bristol, England, and Williams and Wilkins, Baltimore, 1972. viii, 152 pp., illus. $19.50.

During the past decade, organic portions of fossil bones and shells have been analyzed to learn if and when these substances have undergone evolutionary changes. This is the principal subject of this book, and the major conclusion is reached that "analyses made of the oldest fossils thus far studied do not suggest that their proteins were chemically any simpler than those now being produced."

Wyckoff well realizes that studies of fossilized organic compounds must first establish the time course of decomposition of collagen and other organic matrices. Unfortunately, when organic compounds undergo fossilization the microscopic mineralized structure does not always change. Thus at the present time possible significant evolutionary changes may be difficult to distinguish from fossilization artifacts. In order to isolate these artifacts, Wyckoff directs particular attention to the vertebrate remains of the Pleistocene Rancho La Brea tar pits, where very few structural changes have occurred in the fossils. In general, however, the amino acids present in fossils are "dominated, not so much by these acids that are plentiful in the initial protein, as by the more stable among them."

In order to evaluate approximately the state of preservation of organic matrices, Wyckoff's laboratory protocol begins with a careful light-microscope examination of each specimen, followed by scanning or transmission electron microscopy or both. The discovery of the essential identity of fine structure in matrices from fossil and from living organisms is documented in 41 excellent figures. Organic matrices are then analyzed by gas chromatography. Most of the 39 tables record the amino acid composition of proteinaceous remains and a few give data on carbohydrates and lipids. Many original data are cited for fossils as diverse as mammalian teeth, dinosaur bones, bird and reptile eggs, fish bones, mollusk shells, and corals.

This well-written book is directed at the interested nonspecialist. A much more complete index would assist a paleontologist in finding the place where his favorite group is discussed (for example, brachiopods and conodonts are discussed in the text but not listed in the index). In general, Wyckoff succeeds very well in conveying the current state of the art of the study of the organic composition of fossilized animals. Unfortunately, only the rich can afford the book.

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