

## ON CONTEMPORARY PALAEOLOGY

The present issue of *Kosmos* published under the title *Contemporary Palaeontology* contains a collection of articles devoted to one major theme. Its aim is to present an overview of the main problems of palaeontology in the light of most recent research conducted by various teams. As the Editor of the issue I have tried to avoid focusing on a single selected group of problems (e.g. evolutionary palaeontology or palaeoecology) or on a particularly popular subject (e.g. mass extinction). My intention was to present a wide range of problems, methods, and concepts of contemporary palaeontology. The reader may find it a field highly heterogeneous and hard to grasp. This may be a justified impression for it is by no means an accident that attempts are periodically made to formulate a synthesis of the state of the art and the trends in the general development of palaeontology. The last attempt of this kind has resulted in a magnificent book *Palaeobiology. A Synthesis*, edited by two British palaeontologists, D. K. G. Briggs and P. D. Crowther, and published in 1990 under the auspices of The Palaeontological Association, the leading British institution in this field of knowledge. The volume compiled by an international team of most eminent specialists and published according to the highest polygraphic standards, provides a picture of contemporary palaeobiology, viewed by authors and editors simply as a set of most attractive trends in research. One would also in vain look there for some more general considerations concerning palaeontology (and palaeobiology) and their place among other natural sciences. There is one exception, however, namely the article by Antoni Hoffman, the prematurely deceased Polish palaeontologist, who had an exceptional gift of synthesizing.

According to Hoffman, recent years witnessed a splitting of palaeontological research into two trends. The first, or palaeontography, set itself the task of description of certain fossil groups, of reconstruction of their way of life, and their classification. Such research is highly important for the stratigraphy and correlation of different, often quite remote regions of the Earth. The other trend, or theoretical palaeobiology, makes use of empirical material for creating and testing theoretical models, hypotheses and theories explaining the laws and causes of evolutionary changes. Hoffman believed that at the most recent stage in the development of palaeontology there was a growing divergence between the two trends.

Anthony Hoffman's views were certainly substantiated, yet I am convinced that one can define in a different way not only the ultimate purpose and approach of palaeontology but also the essence of what to day is known as palaeobiology. It seems to me that the fundamental task of classical palaeontology was not so much the description of fossils as the reconstruction of their historical record.

Thus, the ultimate result of the research was a "narrative" about the emergence, rise and almost inevitable fall of a given group or lineage of organisms as well as about the presumable causes of all these events. I fully share the views presented by MAGDALENA BORSUK-BIALYNICKA in her article (see p. 623). Telling the story of the history of a given group, or presenting its record is what palaeontology is about, its effort not being limited to classification or phylogeny. A well-studied history of groups and lineages lies often at the basis of great palaeontological theories revealing the causes and mechanisms of change.

In the light of the above considerations, what place should be assigned to palaeobiology? This term was introduced to define the specialized disciplines of palaeontology, whose scope was to provide functional interpretation of fossil remains e.g. the way in which these organisms were moving and feeding. There was a tendency to juxtapose palaeobiology and stratigraphic palaeontology looked upon as a science of fossils in their interrelation with sedimentary strata. With the course of time, the term palaeobiology changed its meaning to cover the entire palaeontology in its modern understanding, that is including both the biological and geological interpretation of fossil organisms. I believe that the term *palaeobiology* cannot be regarded as the name of a separate discipline for it stands for a research programme of modern palaeontology.

This programme implies the use of new methods, notions and concepts borrowed from both life and Earth sciences in order to study and interpret the fossil material. With this in view, and may be against the word's ethymology, it seems reasonable to make palaeobiology comprise a joint study of the history of biosphere in relation to other geospheres, just as the biogeology does. Modern palaeobiology benefiting from the most recent achievements of biology, first of all molecular biology, tresspasses the boundaries of life sciences, compelled to do so by the nature of the fossil material itself. The palaeobiological approach consists in integration of palaeontology (the science of extinct organisms) and neontology (the science of extant organisms) as well as some branches of geology into a uniform conceptual system. Under this watchword function the leading journals of contemporary palaeontology such as American *Paleobiology* and European *Historical Biology*.

The present issue of *Kosmos* comprises articles on a wide array of subjects: the origin of mammals, one of the most fascinating evolutionary issues (Z. KIELAN-JAWOROWSKA), the history of lizzards and their kin (M. BORSUK-BIALYNICKA), the establishment of the systematic position of conodonts and their chordate affinities (H. SZANIAWSKI). The problem of the origin of major phyla of Metazoa in the light of the fossil record is discussed by J. DZIK on the basis of his analytical studies, whilst E. RONIEWICZ tells about the trends in the morphological evolution of scleractinian corals. The history of flies against the background of dipteran insects is told by W. and E. KRZEMIŃSKI'S. J. SZCZETCHURA and E. OLEMPKA-RONIEWICZ'S article deals with the significance of ostracodes for palaeogeography and stratigraphy. Retiolitids as unique and highly specialized graptolites are presented by A. KOZŁOWSKA-DAWIDZIUK.

Biogeology is an emerging discipline setting itself the task of bringing together the methods of several areas of natural sciences. It is discussed by J. KAŹMIERZAK and M. GRUSZCZYŃSKI. Great palaeontological expeditions are known as one

of the methods of collecting new materials. T. MARYAŃSKA and H. OSMÓLSKA present the achievements of the Polish-Mongolian expeditions and their significance for the exploration of dinosaurs. Cladistics as a method of analysing phylogenetic relationships is the subject of M. WOLSAN'S paper. And, finally, D. PERYT presents modern debates on the patterns and causes of mass extinctions. These problems are also a particularly active field of recent palaeobiological research.

It might be well to point out that the authors of all the papers published herein are experienced researchers who have for many years been engaged in the study of the problems presented. Therefore their papers do not merely present the state of the art at a given moment, but also contain numerous original observations and ideas. I am convinced that all this will make them interesting for a broad readership. I would also like to thank my colleagues who have spared no time and effort to make the publication of this issue possible. I thank also Mrs Barbara Bierzyńska for her valuable assistance in the text editing.

A handwritten signature in cursive script, likely belonging to M. Wolsan, the author mentioned in the text. The signature is written in dark ink and is positioned in the lower right quadrant of the page.