PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B BIOLOGICAL SCIENCES

The Role of Palaeoclimate Studies: Geological Indicators

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Phil. Trans. R. Soc. Lond. B 1993 **341**, 343
doi: 10.1098/rstb.1993.0120

The role of palaeoclimate studies: geological indicators

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I very much welcome the fruitful interaction that we have experienced at this meeting between empiricists and modellers, and hope that this can be continued at future conferences. If I have a slight reservation about some of the modelling exercises it is that they tend to be too flexible and accommodating. Empiricists occasionally get the feeling that whatever facts are presented, some model can be generated quite readily to explain them. If the facts change the models are correspondingly adjusted. One could say indeed that there are modellers for all seasons. This is not intended as a snide remark – far from it – merely as a reminder of the need to focus more on critical issues and devise rigorous tests for particular models that may lead to clear confirmation or refutation.

There are two particular matters which I hope modellers will address more in the future. Firstly, what is the likely climatic consequence for the continents of changing sea levels in the Mesozoic? One would anticipate that times of lowered sea level would give rise to greater seasonal contrasts of temperature and greater aridity of the interiors of geographically expanded continents, but more data on quantitative relationships would be very welcome. Secondly, there remains the great mystery of why the Gondwana icecap disappeared in mid-Permian times without any significant change of global geography.

With regard to empirical research, there is a considerable need to glean more information about Mesozoic climates from the record of terrestrial plants. Compared with the knowledge that has been derived from this source for the Cenozoic we know regrettably little. For this reason one must applaud the efforts at this conference by Dr. Spicer and Professor Ziegler to make a start on improving this state of affairs. The richest data base is Eurasia, especially the countries comprising the former Soviet Union, and it is quite evident that Vakhrameev's splendid pioneering efforts can be improved upon. An interesting problem that presents itself concerns the apparent aridity in the low latitude zone of western Pangaea in the Early Mesozoic. This must surely have implications for the herbivorous dinosaurs, which would have required large quantities of plant fodder. Perhaps Dr Parrish is right in stating that the highest dinosaur diversities were in mid- rather than low latitudes, thereby differing from the general pattern recognized among organisms today.

Phil. Trans. R. Soc. Lond. B (1993) **341,** 343
Printed in Great Britain

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