

REVIEW

Earth's Rotation and Climate. By A. S. MONIN. (Translated by R. Radok.)
Radhakrishna Prakashan, Delhi, 1974. 140 pp. \$8.00.

The great advances in the understanding, or at any rate in the computation, of weather from the integration of the equations of fluid motion has emphasized the lack of any similar understanding of climate. Our grandfathers roasted oxen on the frozen Thames and our more remote ancestors chased hairy mammoths over ice sheets. Why have these things changed? We do not know and this book, by a distinguished Russian meteorologist, discusses both the factual evidence and some possible explanations.

The first four chapters develop the theory of changes in the earth's orbit and in the position of its axis in space and discuss their climatic effects. This is the Milankovitch theory of climatic variation. The main difficulty is to assess the climatic effects of changes in insolation. The uncertainty and complexity of the actual course of the Pleistocene ice ages is such that the comparison of theory and experiment is, to me, less than convincing; Monin is cautiously optimistic. The fact that the traditional four stages have euphonious names has, perhaps, given them a status which they do not deserve.

Chapter 5 discusses the history of the moon's orbit and its effect on the earth. Chapter 6 describes the small wobbles of the earth's axis, which have negligible climatic effects. Chapters 7 and 8 discuss the possibility of large displacements of the poles over the surface of the earth.

Chapter 9 describes the methods and conclusions of palaeomagnetism. This evidence is central to any consideration of climate on the geological time scale. Monin, unlike some eminent Russian geophysicists, accepts the reality of continental drift. The last chapter describes the dynamo theory of the earth's magnetic field. This has no close relevance to the main theme.

The book is a useful and interesting brief survey of the facts and possible mechanisms of climatic change; the references to Russian work are particularly welcome. It is clearly impossible to give a detailed account of the very complicated facts and the numerous possible theories in 140 pages. To me the book gives an impression of a certainty in our knowledge of climatic history which is not justified. The absence of proposals for improving our stock of factual information is odd, since the analysis of the JOIDES cores from high latitudes should produce an enormous improvement.

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