

estimates of incompatible elements in the Earth. Carpenter and Burnham have contributed an interesting article on 'The geological record of insects' reflecting the major stages of their evolutionary history. Timur and Toksoz in their paper on 'Downhole geophysical logging' have indicated the importance of the integration of logging data with traditional subsurface measurements which is one of the greatest challenges facing Earth scientist today. The midcontinent rift system has been shown to contain valuable mineral deposits by Van Schmus and Hinze in their contribution to this volume and according to them the exploration along the buried portions of the rift may reveal occurrences of nonferrous metals and also show that it can be a possible source of oil and gas. The review paper by Ziegler *et al* on 'Palaeogeographic interpretation' demonstrates how continent-scale palaeogeographic and palaeogeographic maps are prepared

and how basin development and lithofacies patterns can be related to extensional, compressive and shear tectonic regimes.

Every earth scientist will probably find at least one informative article in this volume of reviews. The overall quality of the book is very good. The book succeeds in its aim to provide very useful update to specialists on individual topics and an overview to those interested in what is going on in earth and planetary sciences outside their fields.

G. V. ANANTHA IYER

Department of Inorganic and
Physical Chemistry,
Indian Institute of Science,
Bangalore 560 012.

NEWS

IMAGINATION AND THE SCIENTIST

... "Most eminent scientists agree that nonverbal forms of thought are much more important to their work than verbal ones. This observation leads me to propound the following hypothesis. The most influential scientists have always nonverbally imagined a simple, new reality before they have proven its existence through complex logic or produced evidence through complicated experiments. There is a simple reason for this phenomenon. Experiment can confirm or disconfirm the tentative reality that imagination invents, and experiments can suggest the need for the invention of a new reality to account for anomalies to the existing one. But experiment cannot, in and of itself, produce conceptual breakthroughs or be used to explain data. Logic is similarly limited. Indeed, philosophers of science are almost universally agreed that logic can be used to test the coherence of theories and to provide proofs of existing ideas, but logic does not

produce the ideas to be tested. One must be able to imagine that which is to be tested and how to test it before one can even begin to employ logical, experimental, and verbal forms of thought. Furthermore, I suggest that this ability to imagine new realities is correlated with what are traditionally thought to be non scientific skills—skills such as playing, modeling, abstracting, idealizing, harmonizing, analogizing, pattern forming, approximating, extrapolating, and imagining the as yet unseen—in short, skills usually associated with the arts, music, and literature."

[(Robert Scott Root-Bernstein in *Transactions of the American Philosophical Society* 75(6): 50-67, 1985). Reproduced with permission from Press Digest, *Current Contents*®, No. 18, May 5, 1986 p. 16, (Published by the Institute for Scientific Information®, Philadelphia, PA, USA)]