A.G. Smith: The motion of Africa and Europe and its relevance to Alpine-Mediterranean tectonics.

Abstract

The motion of Africa relative to Europe (or vice versa) can be obtained from the Atlantic ocean-floor spreading data. These data have been revised to take into account new magnetic anomaly time-scales and new biostratigraphic scales.

The new data show a smoother, simpler motion than some previous models, with limited movement during the Palaeocene. The movement pattern can be related in a general way to the development of the Alpine-Mediterranean region. For an E-W plate margin between Africa and Europe, the Jurassic motion is essentially oblique extension, the Cretaceous motion is oblique compression and the Cenozoic movement is compression.

In addition to these phases, the effects of continental collision bring other motions into being. In particular, the collision between continental prongs appears to cause strike-slip motion of continental fragments and the pinning of subduction zones by collision appears to bring about extension and rotation of small continental fragments, as in the west Mediterranean.

While the Africa-Europe motions appear to control the main phases of tectonic development of the region, there is still no adequate, self-consistent phase tectonic picture of its evolution.

Report

Dr. Alan G. Smith is a lecturer at the Department of Earth Sciences, University of Cambridge, England.

His interest include tectonics, particularly global reconstructions, the geological time-scale, and the application of palaeomagnetism to reconstructions. Dr. Smith is presently on his way to New Zealand to work with John Harper on a model of how plates move.

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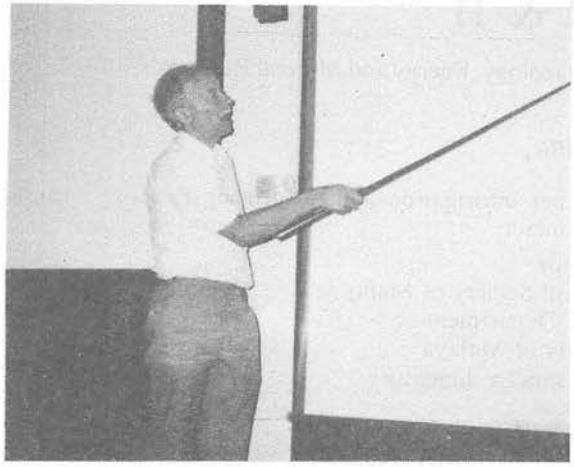

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