EARTH SCIENCES

Dinosaur trek across proto-Atlantic

Fossils found in southeastern Utah, western South Dakota and eastern Nebraska have been identified as belonging to two types of dinosaurs never before known in North America. The fossils are of *Hypsilophodon* and *Iguanodon*, ornithopod dinosaurs well known from Europe and northern Africa, Peter M. Galton of the University of Bridgeport and James A. Jensen of Brigham Young University report in the Oct. 23 NATURE. No trace of either genus has previously been reported from North America.

The fossils are from the Lower Cretaceous period, and their occurrence, say Galton and Jensen, indicates that a land connection existed between Europe and North America at the end of the Jurassic, 136 million years ago. By this time the Atlantic Ocean was well along in the process of widening toward its present width, but in the northern regions it was still narrow. Galton and Jensen speculate that part of the North Atlantic may have been shallow and liable to retreat and advance locally, thus not posing such an absolute barrier to terrestrial animals as the deep ocean. "The presence of two characteristically European genera in North America indicates a northern land route between these two areas at about, or immediately before, the Jurassic-Cretaceous transition."

Convection deep in earth's mantle

What is going on in the earth's mantle to produce motions of the crustal plates which we see as seafloor spreading and continental drift? If it is some sort of convection, how deep does the process go? This is a frontier area of geophysical research.

The best way to learn is through study of seismic wave velocities. Evidence is rapidly accumulating that indicates the existence of significant variations horizontally in the earth's mantle, even at great depths. In the Oct. 30 NATURE, Thomas H. Jordon of Princeton University and the Scripps Institution of Oceanography synthesizes the evidence and concludes that more than just the earth's crust and upper mantle are involved in whatever form of convection is responsible for plate motions.

The evidence indicates that contrasts in seismic velocities beneath the continents and the oceans persist to depths exceeding 400 kilometers and may extend as deep as 700 kilometers. Beneath subduction zones, where crustal plates are descending into the mantle, strong lateral velocity gradients exist at depths greater than 800 kilometers. Beneath the Middle American Trench the zone extends to 1,400 kilometers.

All the evidence leads Jordon to conclude that some sort of convection deep in the mantle would be necessary to account for the current geometry of seafloor spreading and destruction.

Call for a national ocean policy, again

Nothing seems to have been more futile than efforts of the last decade to establish a national ocean policy for the United States. A new Government Accounting Office report on "The Need for a National Ocean Program and Plan" laments: "Although efforts have been made to establish a national ocean program as envisioned in the 1966 [Marine Resources and Engineering Development] Act, marine science activities are as scattered today as they were in 1966." The report notes that the nation's marine science activities and oceanic affairs are being conducted by 21 organizations in 6 departments and 5 agencies. It acknowledges great disagreement on how to change matters but gamely concludes, "A concerted effort should be undertaken to establish a comprehensive national ocean program and plan." It all sounds familiar.