

Drilling Project Leg 71 cores has been constructed for the Maurice Ewing Bank of the eastern Falkland Plateau, southwestern Atlantic Ocean. Specifically, the cores cover portions of the middle Eocene, upper Eocene, and lower Oligocene. Surface water isotopic temperatures postulated for the middle Eocene at Site 512 fluctuated within about four degrees but generally averaged about 9°C (48°F). Bottom isotopic temperatures at Site 512 (water depth = 1,846 m, 6,056 ft) were generally a degree lower than surface water temperatures.

Surface water isotopic temperatures at Site 511 initially averaged about 11°C (52°F) during the late Eocene, but dropped to an average of 7°C (44.5°F) in the early Oligocene. Bottom isotopic temperatures at Site 511 (water depth = 2,589 m, 8,494 ft) generally record temperatures between 12.5°C (54.5°F) and 8°C (46.5°F), similar to the range in the surface water temperatures. During the early Oligocene, bottom isotopic temperatures dropped sharply and averaged about 2°C (35.5°F), very close to present-day values. Surface water isotopic temperature values also decreased to an average of about 7°C (44.5°F), leading to a significant divergence between surface and bottom water isotopic temperatures during the early Oligocene. Comparisons among Southern Ocean DSDP Sites 511, 512, and 277, and between these and other DSDP sites from central and northern latitudes (Sites 44, 167, 171, 292, 357, 398, 119, and 401) show that much of the Eocene was characterized by relatively warm temperatures until sometime in either the middle Eocene, late Eocene, or early Oligocene. At each site, conspicuous <sup>18</sup>O enrichments occur in both the benthic and planktonic foraminifers over a relatively short period of time. Although a general trend toward a climatic deterioration is evident, the density of data points among the various studies is still too sparse to determine either a synchronicity or a time transgression between the major isotopic events.

A close correlation could be made between the Site 511 oxygen isotope temperature curve and paleoclimatic trends derived independently from radiolarian studies. The sharp temperature drop and the divergence between bottom and surface water temperatures during the early Oligocene apparently reflect a major expansion of the Antarctic water mass. The migration of the boundary between the sub-Antarctic and Antarctic water masses over the site at this time would account in part for the sharp temperature changes. Sharp changes of this nature would not necessarily be noted in other geographic areas, particularly those to the north which have different oceanographic regimes.

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#### Trace Fossils in Siluro-Devonian Tidal Flat to Distal Basin Slope Carbonates of Arctic Canada

Upper Silurian and Lower Devonian carbonates of Somerset, Griffith, Cornwallis, and Devon Islands (Arctic Canada) were deposited under conditions which ranged from tidal flat in the south to basin slope in the north. Trace fossils occur commonly in this succession. *Planolites*, *Palaephycos*, *Chondrites*, and *Skolithos* are ubiquitous throughout the sequence. Seven commonly occurring ichnogenera exhibit restricted environmental conditions: *Polarichnus* is confined to tidal flat deposits, *Zoophycos* and *Pilichnia* are most common in deep subtidal shelf and upper basin slope deposits, and *Phycodes*, *Lockeia*, *Taenidium*, and *Cruziana* occur predominantly in basin slope deposits. Seven other ichnogenera, *Arenicolites*, *Arthraria*, *Cochlichnus*, cf. *Furculosus*, *Helicodromites*, *Teichichnus*, and cf. *Thalassinoides*, occur only very rarely.

Trace fossil assemblages of the tidal flat and subtidal shelf carbonates are broadly similar to the *Skolithos* and *Cruziana* ichnofacies reported from environmentally equivalent siliciclastic deposits. Similarly, the assemblage of the deep subtidal-upper basin slope carbonates resembles the environmentally equivalent *Zoophycos* ichnofacies. In contrast, the assemblage of the basin slope carbonates comprises abundant resting and feeding traces (*Cruziana* ichnofacies) whereas assemblages of siliciclastic slope deposits are dominated by complex grazing traces and graphoglyptids (*Nereites* ichnofacies). The relative scarcity of arthropod traces throughout this carbonate sequence probably reflects diagenetic alternation of bedding surfaces.

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#### Radiolarian Succession of Latest Carboniferous through Permian, Urals and West Texas

A succession of characteristic radiolarian assemblages has been recognized through the Late Carboniferous and stratotypic Permian of the Urals and west Texas. The majority of the component taxa are yet undescribed. The oldest well-preserved assemblage from the regions appears in the lower Gzhelian Stage of the Urals and consists of more than 30 species belonging to 12 genera. Typical are large *Albaillella*, curled *Haplodiacanthus*, abundant spongy, cross-axon forms with an open central area, and *Polyentactinia* of octahedral form. The top of the Gzhelian Stage contains 54 species assigned to 18 genera. A new genus of the Corythoecidae, species of a highly plastic, closed spongy, cross-axon form, an unsegmented *Albaillella* with massive basal spines, *Camptoalatus*, *Popofskyellum*, and various triradiate, cross-axon forms are characteristic.

The lower horizons of the Asselian Stage are distinguished by the appearance of *Latenofistula crucex*, a unique, large-pored *Entactinosphaera*, and spherical and elliptical forms with multiple concentric shells. Thus, radiolarian assemblages gradually change at the Carboniferous-Permian boundary. The Sarabil Suite of the Sakmarian Stage is distinguished by *Haplodiacanthus perforatus* (Kozur), *Albaillella permica* (Kozur), and large *Helioentactinia*. In the upper part of the Sakmarian Stage appears assemblage of *Camptoalatus monopterygius* Nazarov and Rudenko, *Raphidociclicus hiulcus* Nazarov and Rudenko, and a new species of *Ruzhencevispongus*. The base of the Artinian Stage is characterized by the appearance of a new, multishelled, spongy polycystine genus possessing a three-rayed internal framework, *Tormentum? pavlovi* (Kozur), and a large, triradiate form with two strongly curving legs. The lower and middle parts of the Aktastinian Substage (Artinian Stage) are distinguished by an undescribed, small, discoidal, five-rayed radiolarian and by *Entactinosphaera* sp. The top of the Artinian Stage is typified by *Haplodiacanthus anfractus*, *Raphidociclicus gemellus*, and *Ruzhencevispongus uralicus* Kozur, and marks the first appearance of *Follicucullus* Ormiston and Babcock in the Urals. This is clearly an older horizon than that of the type species, *Follicucullus ventricosus*, known from the Guadalupian of west Texas. Direct comparison of radiolarian faunas indicates a correlation of the Bone Spring Limestone (Leonardian) of west Texas with the upper Sakmarian and/or Artinian Stages of the Urals.

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