

ear and nonlinear computer-simulation models. Ideal time sections for some of these models illustrate phenomena such as dip reversal, loss of domal character, incomplete unconformity contacts, and creation of faults. Modeling also is becoming increasingly important in reflection-seismic processing and interpretation. However, true progress with models will not take place until we appreciate and understand the limitations of the method, the primary assumptions that are essential, and the consequences of violating these primary assumptions.

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NEW DIMENSIONS: AMPLITUDE AND FREQUENCY MAPPING

(No abstract submitted)

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AUTOMIGRATION OF SEISMIC DATA

(No abstract submitted)

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FOSSIL DIATOMS AND SILICOFLAGELLATES FROM NEWPORT BEACH, CALIFORNIA, STUDIED WITH SCANNING ELECTRON MICROSCOPE

With the advent of the scanning electron microscope (SEM) a new dimension was opened to the micropaleontologist. At its maximum useful magnification of 50,000 diameters, the SEM offers a depth of field of about 10 μ and a resolution of about 200 Å, whereas the optical light microscope, at its maximum useful magnification of 1,300 diameters, offers a depth of field of about 0.5 μ and a resolution of about 2,000 Å. Inasmuch as the classification of diatoms and silicoflagellates is based on the general and detailed characters observed with the light microscope, the use of the SEM must be viewed as an extension of the facilities offered by the light microscope. Ten species of diatoms and silicoflagellates from Miocene rocks, exposed at Newport Beach, California, have been studied with the light microscope and the scanning electron microscope. A comparison of the micrographs of the identical species taken with the two instruments clearly demonstrates the ability of the SEM to provide a more detailed description of taxa, a more precise circumscription of taxa, a separation of closely allied taxa, and a verification of many varieties of taxa.

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OCCURRENCES OF SILICOFLAGELLATES FROM CENTRAL NORTH PACIFIC CORES

Silicoflagellates are siliceous marine planktonic microorganisms which have never been a significant contributor to pelagic sediments. Consequently only limited investigations have been made on these microorganic remains from the deep-sea deposits of the world.

Eleven taxa and one new species of silicoflagellates were recovered from the central North Pacific cores collected above the RV *Thomas G. Thompson* in 1968. The lower lithologic unit of a gravity core, TT28-25, was assigned a Miocene age after careful comparison of previous worldwide records. This is the first time that such a Miocene assemblage has been recognized

from mid-latitude North Pacific sediments. From other cores, Quaternary assemblages were noted, including a limited occurrence of *Mesocena cf. elliptica*. The most recent extinction of this species seems to coincide with the last appearances of *Dictyochoa cf. ausonia* and a proposed new species, *D. subarctios*. Their stratigraphic distribution was examined critically in connection with the results of paleomagnetic-reversal records and data on other microfossils from the area.

It is suggested that silicoflagellates could become a useful tool for deep-sea biostratigraphy in the middle latitudes of the North Pacific Ocean.

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BENTHIC FORAMINIFERAL TRENDS IN PACIFIC-ANTARCTIC BASIN

Trawl samples collected in depths from 3,000 to more than 5,000 m allow the following conclusions.

1. The fauna consists mainly of large, widely distributed bathyal and abyssal Foraminifera. Most assemblages are more than 85% arenaceous, but between 3,000 and 4,000 m some assemblages are predominantly calcareous.

2. Species diversity, although variable, reaches a maximum of 37 at nearly 4,300 m. This maximum coincides with a peak in a diversity factor based on information theory; species equitability is highest at a slightly shallower level. Areal diversity trends are absent.

3. Eleven species are dominant both in abundance and consistency of appearance. Of these, only *Uvigerina peregrina disrupta* Todd is calcareous. *Hormosina robusta* (Pearcy) is the most characteristic species in the area. Other important forms are *Haplophragmoides umbilicatus* Pearcy, *Cyclammina pusilla* Brady, and *Recurvoides contortus* Earland. *Cyclammina orbicularis* Brady dominates the shallowest station (3,043 m), and *Reophax nodulosus* Brady is dominant at the deepest station (5,124 m).

4. Latitudinal and longitudinal transects indicate that *Cyclammina pusilla* and *Haplophragmoides umbilicatus* increase in relative abundance toward the south. *Reophax* spp. and *H. umbilicatus* increase toward the east, and *Psammospaera fusca* Schulze increases toward the west.

5. On the basis of quantitative data available from the western Southern Ocean, a generalized benthic Antarctic foraminiferal zonation seems possible. Bathymetric plots of cumulative percentages of selected index species help in achieving such a zonation.

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PLEISTOCENE-HOLOCENE BOUNDARY IN SOUTHWESTERN INDIAN OCEAN

The Pleistocene-Holocene boundary has been determined in deep-sea cores from the southern Mozambique Channel area of the Indian Ocean. The boundary, dated by radiocarbon at approximately 10,000 years B.P., is defined by changes in the relative abundance of planktonic Foraminifera. These changes reflect a warming in the Holocene of a few degrees Celsius. The temperate species *Globorotalia inflata* (d'Orbigny) shows a marked decrease in relative abundance in the Holocene; it comprises about 20% of the planktonic foraminiferal population below the boundary and only 3% or less above. Simulta-