

REACTIONS TO SOLAR PUMPING IN THE RIFIAN CORRIDOR LEADING TO
THE MESSINIAN SALINITY CRISIS

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New excavations and drilling in the upper Miocene part (6.4 to 5.4 Ma; Messinian) of the continuous Bou Regreg marl section near Rabat have yielded color banding, cyclic variations in carbonate, and oscillations in fauna believed to be linked to the Milankovich cycle. This record was deposited at the western entrance of the Rifian Corridor, the last major connection with the Atlantic of the Paleo-Mediterranean before its isolation during the Messinian salinity crisis. We propose a model of energy transfer driving the water-mass budget deficit of the Paleo-Mediterranean and climate changes in the northern Sahara, linked to variations in solar insolation at 35 degrees latitude.

NEOGENE DEEP-SEA CARBONATE SEDIMENTATION: SOME BASIC
QUESTIONS

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Carbonate sedimentation on the deep sea is traditionally understood as the result of a balance between carbonate supply and dissolution, with a balance between the two achieved at the carbonate compensation depth (CCD). Major changes in patterns are described, therefore, as changes in the level of the CCD in space and time. To this may be added changes in the depth gradient of accumulation rates, which have been interpreted in terms of changes in the rates of dissolution at depth. Another descriptor of the system has been fluctuations of the lysocline (and other levels of equal preservation) whose amplitudes are tied to changes in saturation and, hence, the atmospheric carbon dioxide content.

Recent results from a depth transect drilled on Ontong Java Plateau suggest that the current conceptualization of carbonate accumulation rates were found to vary greatly (factor of 3) even at shallow depths. Rates do decrease with depth, as expected, but this decrease is much greater than calculated from carbonate content, under the assumption that dissolution is the cause of the decrease. This points to a complex of factors responsible for large scale redeposition processes intimately tied to dissolution.

EVALUATION OF POROSITY AND WET BULK DENSITY OF ARCTIC
SEDIMENTS BY HIGH-RESOLUTION MEASUREMENTS OF ELECTRICAL
RESISTIVITY

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During the cruise ARCTIC' 91 with RV POLARSTERN into the central Arctic Ocean, sediment physical properties were routinely measured on piston and square-barrel Kastenlot cores. Index parameters, including water content and bulk density, were determined by direct measurements of total mass, dry mass and total volume of the samples. Other parameters (e.g., porosity) can be derived from these two basic properties.

In addition to this laborious and time consuming standard method, high-resolution measurements of electrical resistivity were tested for a rapid (20 minutes per meter) and efficient logging of porosity and wet bulk density on basis of empirical relationships:

The ratio of electrical resistivity of water-saturated sediment to electrical resistivity of interstitial water at a given temperature, pressure, and salinity is related to porosity by the Archie formula. Wet bulk density was determined from these porosity data assuming a constant grain density and a constant interstitial water density.

For the electrical resistivity measurements, a miniaturized Wenner configuration was used. The Wenner probe consists of a narrow plastic strip (16 x 4 x 100 mm) with four platinum wires.

Wet bulk density and porosity logs derived from electrical resistivity measurements were found to be in excellent agreement (differences $< \pm 0.5\%$) with wet bulk density and porosity data determined by standard methods.

MODERN BENTHIC FORAMINIFERA IN SURFACE SEDIMENTS OF THE CENTRAL ARCTIC OCEAN

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The "ARCTIC 91" cruise with the two vessels ODEN (Sweden) and POLARSTERN (Germany) to the central Arctic Ocean has provided the possibility to study the modern distribution of benthic foraminifera from this area. The central parts of the Arctic Ocean have, until now, been very poorly investigated.

Modern benthic foraminifera from this area show some different types of Arctic benthic environments. Surface samples in a transect from the North Pole to the Yermak Plateau contain abundant benthic, as well as planktic foraminifera. The samples cover a water depth range between 552 m and 4411 m and represent some sites which are seasonally ice-free, even though most sites are characterized by permanent sea-ice.

Foraminiferal assemblages are predominantly calcareous both in total number of specimens and species, and the planktonic/benthic (P/B) ratio generally increases towards the north. The total number of benthic foraminifera varies between 30 and 2,340 per cc sediment and the P/B ratio varies between 0.3 and 32. The frequencies of stained ("living") species are relatively high (15-25%) on the southern Yermak Plateau, while they are $< 3\%$ in the Nansen and Amundsen Basins, and the Morris Jesup Rise.

On the southern Yermak Plateau the benthic foraminiferal communities resemble those of northern shelf areas, while the northern Yermak Plateau, the Nansen and Amundsen Basins, and the Morris Jesup Rise display different assemblages. *Stetsonia arctica* generally dominates at depths $> 2,500$ m. Additional common species are, e.g., *Triloculina tricarinata*, *Eponides tumidus* and *Oridorsalis umbonatus*. *Glabratella arctica*, which is previously reported from single stations in the Arctic Ocean, has been found at some sites occurring with high frequencies.

There is no evidence from the Modern foraminiferal faunas that the bottom waters are undersaturated with respect to calcium carbonate. Not even assemblages from the deepest areas in the Arctic Ocean seem to undergo dissolution, and all areas appear, therefore, to lie above the CCD.