

The abstracts following represent contributions which, owing to the publisher's page limit, cannot be included here in their entirety. The complete papers will appear soon in a supplementary volume.

Papers to be abstracted here were selected according to length (to minimize the number of chapters separated from Volume 41) and subject matter (so that, when published complete, they can be understood without constant reference to the rest of the volume). The papers thus chose deal with specific topics, regions, or stratigraphic intervals. Where possible,

contributions treating the same subject have been kept together (e.g., Palynology and Paleomagnetism). Where a clear-cut decision could not be reached on the basis of length and subject, contributions by shipboard scientists received preference.

The editors and the cruise chief scientists for Leg 41 apologize for the inconvenience caused authors and readers by division of this report into two parts, and thank all the investigators for their interest in the results of Leg 41.

FORAMINIFERA FROM DSDP SITE 370, LEG 41, EASTERN NORTH ATLANTIC OCEAN

F.M. Gradstein

Foraminifera in 12 composite samples from DSDP Site 370, Leg 41, eastern North Atlantic Ocean are of Valanginian through Cenomanian, and Eocene through Quaternary age. Comparison of the Lower Cretaceous deposits at Site 370 with coeval sediments on the Canadian Atlantic continental margin suggest a deeper water deposition of the Site 370 sediments. The absence of larger Foraminifera, and the rarity of epistominids and ostracods at Site 370 appear to be the main differences with the Lower Cretaceous sediments of the Canadian Atlantic Shelf. The Lower Cretaceous sediments at Site 370 appear to have been deposited in bathyal depths (see Jansa et al., this volume) whereas the microfauna, sedimentology and geology of the Canadian Atlantic Shelf suggest that Lower Cretaceous sediments there were deposited in water depths that were mostly neritic.

PALYNOLOGICAL BIOSTRATIGRAPHY, DEEP SEA DRILLING PROJECTS SITES 367 AND 370

G.L. Williams

Samples from Sites 367 and 370, Leg 41 Deep Sea Drilling Project were analyzed for palynological biostratigraphy. The oldest sediments dated palynologically at Site 367 are Kimmeridgian. Spores and pollen are most abundant in the Lower Cretaceous, with a more or less complete section extending from 1062.5 to 777.5 meters. Palynomorphs are sparse or absent in the Upper Cretaceous and Tertiary. Comparisons of the assemblages at Site 367 with those of the Scotian Shelf-Grand Banks show some similarities, but it is impossible to draw any conclusions due to the overall sparseness of palynomorphs at Site 367.

Palynomorphs, especially dinoflagellates, are abundant throughout the section at Site 370. The oldest sediments at Site 370 are Valanginian and are overlain by a more or less complete Hauterivian-Cenomanian sequence. There is a gap between the highest Cenomanian sample at 673 meters and the lowest lower Eocene sample at 644.5 meters. Eocene through Plio-Pleistocene sediments have been recognized and compared with coeval assemblages elsewhere. The Cretaceous and Paleogene palynomorph assemblages can be satisfactorily correlated with the Scotian Shelf-Grand Banks zones.

CRETACEOUS CALCISPHAERULIDS FROM DSDP LEG 41, EASTERN NORTH ATLANTIC

Uwe Pflaumann and Valery A. Krasheninnikov

Nine new species, one new forma, two other forms in open nomenclature, and two previously known species of *Pithonella*, attributed to the incertae sedis family *Calcisphaerulidae* are described from Lower and Upper Cretaceous sediments from the North Atlantic Ocean off northwest Africa collected during Leg 41 at Sites 369 and 370. Features such as shape, wall structure, number of layers forming the wall, crystal shape, and arrangement, as well as presence or absence of pores are used to establish new species and groups.

The stratigraphically and regionally restricted occurrences and ranges of the species here described have to be confirmed by additional investigations on further material from other regions to state the stratigraphic and paleoecologic value of these microfossils.

SPORES AND POLLEN FROM CRETACEOUS DEPOSITS OF THE EASTERN NORTH ATLANTIC OCEAN, DEEP SEA DRILLING PROJECT, LEG 41, SITES 367 AND 370

Ida Z. Kotova

Four spore-pollen assemblages have been identified in palynological samples from Sites 367 and 370, Deep Sea Drilling Project. Only two of seven samples of black shale from Site 367 contained spores and pollen; the remaining 5 samples were either barren or contained only sporadic specimens. Spores and pollen were recovered from 6 samples from Site 370, representing an abundant and diverse dinoflagellate and acetaechean flora, with four spore-pollen assemblages identified within the interval 749-996 meters. These four zones, from oldest to youngest, are: Neocomian, Aptian (?) to lower Albian, upper Albian to lower Cenomanian, and Cenomanian.

The palynomorph assemblages observed suggest that spores and pollen were derived from the shores of west Africa, Eurasia, and, very likely, North America. This conclusion is based on the presence of typical African genera and species, as well as pollen of bisaccate conifers and some spores and pollen that are not known from Cretaceous sediments of Africa, but are found in Eurasia and North America.

The assemblages studied are well correlated with synchronous ones of west Africa and Brazil. However, a much lower content of most species and genera, as compared with assemblages from near-shore basins of west Africa and Brazil, is worth noting.

The climate that prevailed during accumulation of Cretaceous sediments from Sites 367 and 370 must have been warm and dry, as evidenced by abundant pollen *Classopollis* and the diversity of pollen *Ephedripites* and *Steevesipollenites*.

QUATERNARY STRATIGRAPHY AND PLANKTONIC FORAMINIFERS OF THE EASTERN ATLANTIC

Uwe Pflaumann and Valery A. Krasheninnikov

Planktonic foraminifers are abundant and well preserved in Quaternary sediments at all five sites cored on Leg 41, however, cores from the two rise sites, Hole 366A and Hole 368, are most important for stratigraphy. The faunas are attributed to the tropical-subtropical province marked by the dominance of species of *Globigerinoides*, *Globorotalia*, and *Orbulina*. Cooler conditions are indicated at Site 368 by the increased abundance of *Globigerina* and the presence of *Globorotalia inflata*.

We distinguished 54 planktonic foraminifer species and subspecies that form the basis of a subdivision of the Quaternary, using the subzonation scheme of Bolli and Premoli Silva (1973). The following five subzones of the Quaternary have been distinguished: *Globorotalia crassaformis* *viola*, *Globorotalia crassaformis* *hessi*, *Globigerina calida* *calida*, *Globigerina bermudezi*, and *Globorotalia fimbriata*.

PLIOCENE-PLEISTOCENE COCCOLITH ASSEMBLAGES FROM THE SIERRA LEONE RISE, SITE 366, LEG 41

Christian Samtleben

The late Pliocene coccolithophorid flora from Hole 366A is characterized by two groups of species. One group comprises the tropical-subtropical species of which *Helicosphaera carteri* shows the highest percentages. The second group is characterized by *Pseudoemiliania lacunosa* and *Crenolithus doronicoides*. The proportions of species are positively correlated within the two groups, but negatively correlated between groups.

The proportions of species within the tropical-subtropical group were considerably suppressed in the early Pleistocene. However, the number of species was only slightly lower with the exception of a strong decrease in species of the warm-water genus *Scyphosphaera*. The impoverishment that occurred in higher latitudes during the Pleistocene apparently did not occur in low latitudes. *Gephyrocapsa caribbeanica* appears at the Pliocene-Pleistocene boundary, with the emergence of *Gephyrocapsa oceanica* in the middle Pleistocene. *Gephyrocapsa oceanica* characterizes the coccolith community from the middle Pleistocene on, and probably occupies the same ecological position formerly held by *Pseudoemiliania lacunosa* and *Crenolithus doronicoides*. *Gephyrocapsa* sp. A, a eurythermal species which prefers cool water, forms only a small proportion of the flora.

PALYNOLOGY OF PALEOGENE CLAY FROM DSDP SITE 368, CAPE VERDE RISE

Elena D. Zaklinskaja

Sixteen samples from Site 368 were examined for palynomorphs with the aim of obtaining supplementary palynological data related to the Cretaceous-Paleogene boundary. Pollen of land plants and a diverse complex of microplanktonic cells were found in only one sample (41-4, 11-13 cm). Pollen in this sample are mostly from angiosperms. Gymnosperms pollen are usually absent, but a few rare pollen grains of *Ephedripites* and Cycadaceae (?) were found.

The observed complex of palynomorphs characterizes a flora of the forest type and plant coenoses associated with coasts having humid microclimates that promoted the growth of bushwoods of the mangrove type. The predominance of angiosperms in the assemblage indicates that the shore line was not more than several hundred kilometers from the site of deposition.

NEOGENE SAND LAYERS OFF NORTHWEST AFRICA: COMPOSITION AND SOURCE ENVIRONMENT

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Neogene sand layers were recovered during DSDP Legs 14 and 41 in seven holes at the West African continental margin, between 12° and 35°N. Based on their sedimentary structures, grain sizes, and the composition of their coarse fractions, three major genetic groups of sand layers are distinguished: contourites, turbidites originating from fluvial deltas, and turbidites formed by eolian dune sands, both in proximal and distal facies. The source environments are characterized by compositional features, which are independent of transport sorting, such as the abundance of feldspar, of stained and frosted quartz, or the composition of reworked faunas. Eolian-sand turbidites are the only layers with noticeable open porosity. They occupy a time-transgressive zone which follows a northward plate-tectonic shift from the Pleistocene to the early Miocene of the area between 14°-20°N by 6 to 7 degrees of latitude. During the Pleistocene, this zone is marked as the synglacial position of Sahara dunes advancing towards the shore line at the shelf edge and generating turbidity currents at the slope. Fluvial-sand turbidites occur further to the south and north. The turbidites at Sites 370 and 135 are additionally influenced by the rising Atlas Mountains.

Turbidites and contourites both appear concentrated in a few stratigraphic horizons: at 23 to 20, ~13, and 3 to 2 m.y.B.P. The paleoenvironment of these horizons can be characterized by a low sea level (indicated by the formation of eolian-sand turbidites itself and by abundant erosion of glauconite on emerged shelf plains), by vigorous off-shore Trade Winds (moving dunes towards the shore and forming dust beds on the slope), by strong coastal upwelling (dominance of fish remains and siliceous fossils at the supposed center of Trade Winds influence), by temperate temperatures in coastal waters (skeletal sands of "Foramol" group), and by increased bottom-current activity (contourites). In conclusion, these conditions resemble Pleistocene glacial events and agree well with evidence from other parts of the oceans.

An early phase of Cape Verde volcanism shows up with pumice grains in the lower NN 18 Zone.

MICROFACIES AND MICROFABRICS OF EARLY MIDDLE CRETACEOUS SEDIMENTS SELECTED FROM SITE 370, DSDP LEG 41 (DEEP BASIN OFF MOROCCO)

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Preliminary results in this paper concern 10 samples selected from mid-Cretaceous sediments from Leg 41, DSDP Site 370 off the Moroccan continental margin (northwest Africa). These samples originate from a subbottom depth of more than 835 meters. They represent interbeds of relatively coarse-grained lithified sediments including quartz-bearing calcirudites, calcarenites, and calcisiltites, in a sequence of predominantly silty and nanno-bearing shales of late Neocomian to lower Aptian age.

The microfacies and microfabrics of the samples have been studied by optical and scanning electron microscope as well as by X-ray diffraction, chemical, and staining methods. Different microfacies types (A-E) were distinguished according to specific composition. They are abundant, especially quartz, potassium feldspar, plagioclase, dolomite, and fragments of polygenetic rocks. Furthermore, the sediments include allochemical components that have originated in shallow-water

environments. These components are mainly biogenic detritus, as well as oolites, superficially coated grains, and glauconite particles. Probably most of the coarse material was transported by turbidity currents from shelf and continental sources into the basin. The arenaceous sediments are well cemented grainstones in which up to three sequences of calcite cement can be differentiated.

MAGNETOSTRATIGRAPHIC STUDIES OF CRETACEOUS SEDIMENTS FROM DSDP SITE 369

B.H. Keating and C.E. Helsley,

Results from a paleomagnetic study of Cretaceous sediments from Site 369 indicate that the Late Cretaceous is characterized by a long interval of normal polarity ranging in age from latest Campanian to Aptian. Three intervals of reversed polarity were found in sediments of middle Maestrichtian and late Aptian age. Two of these polarity zones have been tentatively correlated with sea floor anomalies 31 (Heirtzler et al., 1968) and M-O (Larson and Hilde, 1975).

A PRELIMINARY PALEOMAGNETIC STRATIGRAPHY FOR LOWER EOCENE SEDIMENTS AT SITE 366 (SIERRA LEONE RISE) AND MIOCENE AND OLIGOCENE SEDIMENTS AT SITE 368 (CAPE VERDE RISE), NORTHWEST AFRICAN CONTINENTAL MARGIN

Ernest A. Hailwood

Attempts have been made to correlate paleomagnetic stratigraphies at Sites 366 and 368 with existing magnetic reversal time scales. Polarity determinations in sediments from Site 368 were too widely spaced to allow unambiguous correlation with the standard polarity time scale of Ryan et al. (1974). However, using correlations of microfossil zones, a provisional correlation has been attempted. Correlation between magnetic polarities of sediments at Site 366 and the polarity time scale of Tarling and Mitchell (1976) suggests a change in accumulation rate from 23 m/m.y. to a minimum value of 52 m/m.y. at some depth between 621 and 645 meters.

PALEOMAGNETISM AND ROCK MAGNETISM OF UPPER JURASSIC LIMESTONE AND BASALT FROM SITE 367

Dennis V. Kent and Lan Ping Tsai

Remanent magnetization measurements were made on 49 samples of upper Jurassic limestone varying from gray to red and 7 samples of basalt recovered at Site 367. The gray limestones have very weak magnetizations and are of limited use paleomagnetically. The red limestones have stronger remanences and fair to good magnetic stabilities. The mean remanent inclination of the most reliable set of red limestone samples ($N=14$) after 200-oe AF demagnetization is $25^\circ \pm 5.1^\circ$, near the present axial dipole field inclination (24°) as well as the expected inclination of the Jurassic field (21° to 30°) at the core site. A single stable reversed direction of magnetization (Sample 33-3, 88 cm) may represent the earliest interval of reversed geomagnetic field polarity of the Late Jurassic-Early Cretaceous magnetic reversal sequence. The basalt samples had very unstable remanent magnetic properties, characterized by median demagnetizing fields less than 100 oe. The samples were able to acquire large viscous remanences (VRM) in the laboratory in a 1.0-oe field. Moreover, the intensity of VRM acquired in the presence of the NRM was at least a factor of five greater than that acquired under similar conditions but after AF demagnetization. The measured magnetic properties of these basalt samples suggest that the magnetic quiet zone in the general region of Site 367 may be due in part to reduction of magnetization contrast in the magnetized basement layer by viscous remagnetization.