

ABSTRACT

On Leg 3 of the Deep Sea Drilling Project, 17 holes were drilled at 10 sites in the equatorial and south Atlantic Ocean between Dakar, Senegal, and Rio de Janeiro, Brazil. The sites are located over three major physiographic features of the sea floor: the Sierra Leone Rise (Site 13), the Mid-Atlantic Ridge (Sites 14 through 20), and the Rio Grande Rise (Sites 21 and 22). The drilling penetrated to basalt (basement) at all Mid-Atlantic Ridge sites, located in profile across the ridge at about 30° S. latitude; and, drilling was terminated in sediments at other sites.

The paleontologically dated sediment cores range in age from late Pleistocene to Campanian, and several stage and series boundaries have been recovered. The sediment types vary widely, including foraminiferal and nannoplankton oozes, siliceous oozes and unfossiliferous clays. At some sites (e.g., Site 13) sediments of one type frequently appeared to be deposited for periods of 10^6 to 10^7 years, with a change to another sediment type occurring in a relatively short time. Such changes are presumably representative of either local or ocean-wide environmental conditions. On the Rio Grande Rise, the relatively calcareous sediments dating from Campanian time, indicate that this part of the sea floor has remained comparatively shallow (2 kilometers or less) since the Campanian.

Based primarily on their calcareous content, sedimentary formations have been identified and correlated across the profile of Mid-Atlantic Ridge sites. These formations are time-transgressive across the Ridge, apparently as a result of variable water depth across the Ridge combined with sea-floor spreading. The ages of basal sediment above basalt at all Ridge sites are within a few million years of the inferred magnetic anomaly ages. The pattern appears to support an overall half-spreading rate of nearly 2 centimeters per year for the past 76 million years.

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