MIOCENE SEDIMENTS AND MICROPALEONTOLOGY IN GRAVITY CORES FROM RISP/J9 AND COMPARISONS WITH DVDP AND DSDP DRILLCORE SUCCESSIONS

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Abstract: Eleven short gravity cores (up to 102 cm in length at time of collection) were obtained through the Browning access hole at Ross Ice Shelf Project Site J9 during December 1977 (P. N. WEBB: Ross Ice Shelf Rep., **78/1**, 46 p., 1978; P. N. WEBB and H. T. BRADY: EOS, **59**, 309, 1978; P. N. WEBB *et al.*: Science, **203**, 435, 1979). Site J9 is located at 82°22′S; 186°38′W (Fig. 1). The mudline at this site is 597 m below present sea level. The seafloor in this area exhibits a very subdued relief. At J9 the Ross Ice Shelf is 420 m thick and overlies a marine water column of about 237 m. The site is some 400 km from the open water of the Ross Sea. The collection of gravity cores took place over a two week period. The daily movement of the ice shelf in this area amounts to about 1 m/day in a northerly direction.

The short sedimentary succession obtained during repeated coring may be separated into two distinct lithological units, an upper light olive gray diatomaceous (±15% diatoms) sandy mud (<20 cm thick) and lower olive gray diatomaceous (±15% diatoms) sandy mud. A thin (<1 cm) microlaminated iron-rich unit marks the boundary between the two units. Igneous, metamorphic and diatomaceous ooze pebble and granule-sized clasts are distributed through the fine-grained sediments. Smear slide analysis shows clay, quartz and feldspar to be the dominant minerals in the fine fraction. Volcanic glass, zeolites and micromanganese nodules and carbonate make up a minor part of the smear slide preparations. X-ray analyses of the <2 μ fraction indicates the presence of quartz, feldspar, illite (mica), chlorite, and smectite (montmorillonite is present in minor amounts) in the lower unit; and quartz, feldspar, illite (mica), chlorite (minor amounts), smectite (montmorillonite is again present in minor amounts) and vermiculite in the upper unit.

The biogenic component includes diatoms (abundant) (H. T. BRADY and H. MARTIN: Science, **203**, 437, 1979; H. T. BRADY: Antarct. J. U. S., **13**, 123, 1978), silicoflagellates (rare), sponge spicules (common) radiolaria (rare), palynomorphs (rare), dinoflagellates (rare), benthic calcareous foraminifera (common), planktonic foraminifera (rare), macrofossil debris (rare) and coal fragments (rare). Siliceous microfossils are distributed through both units, whereas calcareous microfossils are present only in the lower unit. Rich and diverse assemblages of mid Miocene diatoms occur in the lower and upper units. Calcareous benthic foraminifera in the lower unit suggest an early-middle Miocene age. Microfaunas correlate with those reported from Deep Sea Drilling Project Legs 28 and 29 but are older than microfaunas present in the oldest sediments

recovered in Taylor Valley (DVDP 11: 200–328 m). There is no microfaunal evidence in support of a Pliocene or Pleistocene sedimentary succession at RISP/J9.

Miocene sediments at J9 were deposited primarily from floating ice but the abundance of planktonic taxa indicates sporadic ice cover at least during part of the year. Benthic foraminifera suggest a paleobathymetry no shallower than 400–500 meters.

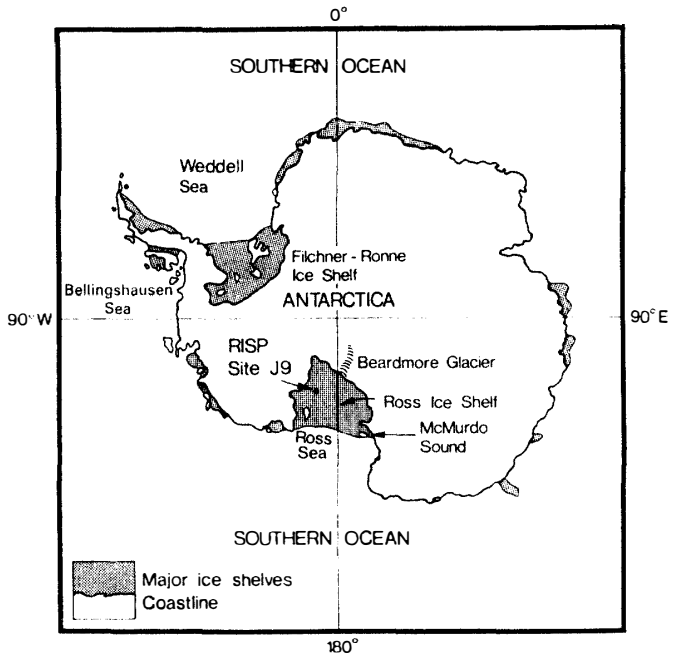

Fig. 1. Location map for Ross Ice Shelf Drilling Site J9.

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