only within 100 km of the Precambrian Izvestiy Tsik Islands. The East Novaya Zemlya trench is slightly under compensated, having a median free-air gravity of −9 mgals and extremes of −33 and +11. Two refraction measurements in the eastern Barents Sea yielded 400 m unconsolidated sediments over a 3.1 km/sec basement and 700–1,100 m of 2.8 km/sec sediment over a 4.1 km/sec basement. The basement is probably Paleozoic sandstone or shale.

WATERHOUSE, J. B., Dept. Geology, Univ. Toronto, Toronto, Ont.

COMPARISON OF CANADIAN ARCTIC BRACHIOPODS TO AUSTRALIAN PERMIAN BRACHIOPODS: SIGNIFICANCE FOR CONTINENTAL DRIFT

Permian faunas from the Canadian Arctic range in age from Asselian to Wordian (Lower to Middle Permian) and are very close to faunas of Siberia. Brachiopods are intermediate in diversity between very rich faunas, from areas now placed at 20°–30°N (*e.g.*, Texas, South China, Armenia, Sicily), and very impoverished faunas found in eastern Australia, especially Tasmania. Genera that are especially characteristic of eastern Australia, such as *Wyndhamia, Terrakea, Attenuatella, Cancrinelloides,* the *Licharewia* suite, *Tomiopsis,* and *Marinurnula,* appear in the Canadian Arctic at distinct zones near the base of the Jungle Creek Formation, the middle of the Tahkandit Formation in Yukon Territory, and in the Assistance and Trold Fiord Formations of the Canadian Arctic Archipelago. The lower zone is of Asselian age (*Tomiopsis, Yakovlevia* and *Attenuatella* zones of Bamber and Waterhouse, and the younger zones are of Ufimian and Kazanian age (*Thamnosia, Lissochonetes,* and *Cancrinelloides* zones of Bamber and Waterhouse). Warm-water indicators such as Fusulinacea and reef-building corals abruptly disappear from the same zones, so it appears likely that waters became cooler during intervals, coinciding with continental glacial advances in Australia during the Asselian and Ufimian. Thus, although there was no Permian glaciation in the Arctic, it did undergo cooling simultaneously with Gondwana glaciation.

A striking feature of the brachiopod genera shared between Australia and the Canadian and Siberian Arctic, is their disjunct distribution. They are not known in faunas of highest diversity, and so seem to have been adapted for cool waters. Just how they crossed the equatorial belt is a matter for speculation. They may have either slipped through the equatorial barrier during brief intervals of mass migration and faunal disturbance resulting from advancing glaciation, or they may have occupied obscure niches until the onset of cooler conditions caused the retreat of warm-water life. A second noteworthy feature is the asymmetric nature of the comparison. The Siberian and Canadian Arctic faunas compare most closely in diversity and structure with those of Queensland, Western Australia, and New Zealand; but the Arctic faunas are found from 60° to 80°N. The comparable southern faunas are found not at 60° to 80°S, but at 20° to 40°S. Together with the fact that the most diverse faunas are best known well north of the present equator, this implies northward continental displacement by about 30°–40° since the Permian. Tasmania moved from about 80° to 40°N, the paleo-equator moved from 0° to 30°, and the Canadian Arctic from 45° to 75° (average). This is in rough accord with most paleomagnetic results. The writer disagrees sharply with the claims that Permian faunas do not support continental displacement. Such claims appear to be based in part on a misunderstanding of polar positions, and chiefly on incomplete analyses which generally ignore the Permian faunas of Australia.

WOLD, RICHARD J., Univ. Wisconsin at Milwaukee, and NED A. OSTENSO, Office Naval Research, Arlington, Va.

AEROMAGNETIC EVIDENCE FOR ORIGIN OF ARCTIC OCEAN BASIN

Approximately 147,000 km of low-level (450 m) aeromagnetic tracks were flown over the Arctic Ocean and adjacent Greenland and Norwegian Seas. From these data inferences could be made about the geologic structure and evolution of the Arctic Ocean basin. The Alpha and Nansen Ridges produce magnetic profiles that show axial symmetry and correlate with profiles in the North Atlantic that cross the Reykjanes Ridge and profiles in the Norwegian Sea that cross Mohns Ridge. A quantitative attempt has been made to verify these correlations, which infer that the Alpha Cordillera became inactive 40 m.y. ago, when the locus of rifting shifted to the Nansen Cordillera. The lack of magnetic disturbances associated with the Lomonosov Ridge is interpreted to be a section of the former Eurasian continental margin that was translated into the Arctic basin by sea-floor spreading along the Nansen Cordillera axis. Within the Canada basin there is a thickening of sediments from the Asia continental margin toward the Canada Arctic Archipelago. Sediment thickness in the Makarov basin is estimated to be 1–1½ km. There appears to be only about ½ km of sediment covering the younger Fram and Nautilus basins. The absence of large magnetic anomalies over these basins can be explained by a 10-km elevation of the Curie isotherm.

WOLFE, J. A., U.S. Geol. Survey, Menlo Park, Calif.

BIOSTRATIGRAPHY OF NONMARINE TERTIARY OF NORTHERN PACIFIC BASIN

Studies of plant megafossils and microfossils in Alaska and the Pacific Northwest indicate that at least 15 biostratigraphic units can be recognized in this region. Where independent age assignments are available from radiometric dating or marine invertebrates, the units can be demonstrated to be both time sequential and nonhomotaxial. In Alaska, collections of plant megafossils have been made from over 200 localities, many in stratigraphic succession. The major sequences studied are in the Gulf of Alaska region, Cook Inlet region, and the central part of the Alaska Range.

Correlations based on lineages and overlapping ranges of plant megafossils are more reliable than correlations based on pollen. Because of climatic fluctuations, 2 pollen assemblages of different ages may resemble one another more closely than intervening assemblages. Additionally, whereas a given plant species recognizable on megafossils can range through 2 or more vegetational types, the pollen assemblages from isochronous vegetational types may be radically different.

Two major periods of Tertiary nonmarine deposition are apparent in Alaska. The first—of Paleocene age—is recognized in most areas of Alaska. The interval from the Eocene through early Oligocene is represented by nonmarine rocks only with certainty in the Gulf of