accumulation of Plio-Pleistocene debris derived from adjacent uplifts.

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STRATIGRAPHIC AND PALEOECOLOGIC SIGNIFICANCE OF DIATOMS AND SILICOFLAGELLATES

The west coast of North America has had marine environments particularly conducive to the accumulation and preservation of the most entensive deposits of diatomaceous sediments in the world. Inasmuch as this area can furnish dependable geological occurrences and, in turn, accurate stratigraphic ranges of diatom species from the Cretaceous to Recent, it can eventually become the standard of the world for diatom biostratigraphy. The following twelve floras have been described, they are: Late Cretaceous, 155 species, 136 restricted; late Eocene, 42 species, 19 restricted, largely planktonic species; early Oligocene, 51 species, 21 restricted, decreasing number of open-sea forms; middle Miocene, 82 species, 54 restricted, largely benthonic forms; late Miocene, 47 species, 7 restricted, mainly neritic to sub-littoral; late Miocene, 69 species, 24 restricted, mainly planktonic; late Miocene, 96 species, 52 restricted, mainly benthonic forms; late Miocene, 280 species, 145 restricted, mainly vagile benthonic and sessile littoral forms; early and middle Pliocene, 150 species, 70 restricted, planktonic forms in the lower and middle portion with bottom dwellers increasing in number in the upper portion; early Pliocene, 59 species, 18 restricted, mainly planktonic species with a minor number of brackish-water forms; late Pliocene, 101 species, 19 restricted, mainly planktonic species with a minor number of fresh-water forms; early Pleistocene, 136 species, brackish and fresh-water forms.

The diatoms also serve as a satisfactory check on the paleoecologic significance of diatomaceous deposits, not only because most diatoms are restricted to certain environments with regard to temperature, pH, and salinity, but also because they are restricted as to mode of life, *i.e.*, planktonic, neritic, vagile, and sessile benthonic, littoral, marine, brackish, and fresh water.

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PLIOCENE SEAKNOLL AT SOUTH MOUNTAIN IN VENTURA BASIN, CALIFORNIA

Extensive drilling in the southern Ventura basin in the last decade has provided useful data about Pliocene basin floor topography. The pre-basinal Miocene Modelo Formation, mainly siliceous shale, limestone, and organic shale with a bathyal microfauna, underwent extensive undersea tilting and faulting, resulting in a surface of high relief upon which the deep-sea Plio-Pleistocene Pico Formation was deposited. Among the land forms of this surface was a seaknoll at South Mountain.

Seaknoll features preserved include relatively uneroded fault scarps exceeding 40° in slope, a thin veneer of glauconite sandstone locally containing a talus of marine-laid Modelo limestone fragments from the scarps, and, near the seaknoll summit, a small biostrome in a shelly glauconite sandstone matrix. The steep fault scarps at South Mountain contrast with bevelled fault scarps at nearby Berylwood anticline and the Oxnard plain, on the site of a pre-Pico submarine slope eroded in the Modelo Formation.

The Pico Formation has onlapped and buried the seaknoll and the submarine slope. The Pico contains graded sandstones interbedded with siltstones containing indigenous bathyal and displaced neritic microfaunas. The sandstones shale out toward the seaknoll, suggesting that the seaknoll was mildly positive during sandstone deposition.

The submarine slope was scoured by bottom currents laden with sediment from subaerially eroded highlands toward the south and east. The seaknoll was unaffected by such currents because it was separated from highlands by deep-sea channels; hence its scarps were relatively unscoured by sediment-laden currents. Both submarine slope and seaknoll remained below sea level until buried.

Erosional submarine unconformities of the Berylwood and Oxnard plain submarine slope type are believed to be relatively common in basins where sedimentation and deformation have occurred simultaneously. Regarding these unconformities, the overlying sediments are of deep-sea rather than shallow-water origin, and are transgressive. The argument for submarine origin of the Mio-Pliocene unconformity in the southern Ventura basin, even where extensively eroded, is strengthened by the presence of the seaknoll, locally preserved from turbidity current scour, on which fault scarps and a glauconite-rich veneer have been preserved.

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CRUSTAL STUDY OF TRANSCONTINENTAL STRIP EAST OF ROCKY MOUNTAINS

A set of aeromagnetic profiles for a strip 100 mi. wide extending from the Rocky Mountains to the edge of the continental shelf off the eastern coast of the United States reveals large anomalies of major crustal significance. The data consist of 20 profiles flown at a barometric altitude of approximately 5,000 feet, centered along a line from Denver, Colorado, to Washington, D.C., and spaced approximately 5 mi. apart.

Several distinct anomalous patterns reflecting basement lithology can be clearly recognized. These include the Piedmont province in the eastern United States and the basalt flows in Iowa and Nebraska (mid-continent gravity "high"). The most intense anomalies occur in central and western Nebraska. Two anomalous areas in eastern Iowa and western Ohio probably are related to a single tectonic province and are correlatable with a pronounced horseshoe-shape gravity feature extending from eastern Iowa through eastern Minnesota across northern Lake Michigan and through the central part of Michigan and western Ohio. A linear magnetic anomaly at least 100 mi. long and 35 mi. wide is present over the Appalachian plateau and parallels the Appalachian structural trends.

The large amplitude and areal extent of the magnetic anomalies and their obvious correlation with known gravity anomalies suggest intrabasement units of correspondingly high acoustic velocities. It is clear that these vertical lithologic discontinuities must be taken into account in deep refraction studies of the crust and upper mantle; otherwise, seismic interpretations based on horizontal discontinuities alone yield incorrect crustal thicknesses.