Pseudoparrella Cushman and ten Dam, *Epistominella* Husezima and Maruhasi, *Megastomella* Faulkner, de Klasz, and Rerat, *Stetsonia* F. L. Parker, and two undescribed genera. Species of the Pseudoparrellidae occur in Oligocene? to Recent deposits. Although some genera and species have been reported from much older rocks, these reports are based on misidentifications. Pseudoparrellidae are known from all parts of the world: *Pseudoparrella* is cosmopolitan; *Epistominella* is known from the northern Pacific and Arctic Ocean areas; *Megastomella* is known from the Miocene of Africa and California; *Stetsonia* is reported from the Gulf of Mexico and Arctic Ocean; and the other genera are known from the eastern Pacific area. Recent species generally are found in relatively deep water on fine-grained substrates and extinct species apparently had similar ecologic requirements.

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Miocene Planktonic Foraminifera from Near Newport Beach, California

Planktonic Foraminifera are present in abundance in the middle to upper Miocene (upper Luisian and lower Mohnian) Monterey Shale exposed at Newport Bay, California. About 20 species of planktonic Foraminifera are tentatively recognized. The greatest number of species and individuals occur in the upper Luisian, including species of *Globigerina*, *Globoquadrina venezuelana*, *Orbulina suturalis*, and *Globigerinoides trilobus*. In the uppermost Luisian, just below the Luisian-Mohnian boundary, is a local zone characterized by *Hastigerina* (*Bolliella*) sp. nov. which may prove useful in regional correlation. Species and individuals are less numerous in the lower Mohnian, although *Globigerina bulloides*, *G. pachyderma*, and *Globorotalia scitula* are present. During the time represented by these rocks species of planktonic Foraminifera were not as numerous at Newport Bay as in tropical areas where the standard planktonic reference sections were defined. Thus correlation to these areas is not yet established.

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Deep Structure of Continents

Observations of heat flow and gravity suggest that continental structure extends to depths of the order of 500 km. The preliminary studies of surface waves tentatively confirm the existence of regional differences between continental and oceanic mantle. The distribution of earthquake foci along continental borders and the concentration of deep-focus earthquakes at the borders similarly imply differences in thermal structures extending to depths of the order of a few hundred kilometers. The deep structure of continents places heavy restrictions on any theory of continental drift. A relative motion of the continents must involve the mantle to depths of several hundred kilometers; it is no longer possible to imagine thin continental blocks "sailing" over a fluid mantle.

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Offshore Oregon: Some Notes on Petrography and Geologic History

Miocene and younger sedimentary rocks crop out on the continental shelf and slope off the central coast of Oregon. The predominant lithology is diatomaceous siltstone which contains different quantities of glass shards, Radiolaria, Foraminifera, sponge spicules, and glauconite. Glauconite sandstone was collected from the northern part of Heceta Bank. Angular, poorly sorted, volcanic sandstones were obtained in one sample from Heceta Bank and from several samples taken near the base of the continental slope.

Foraminifera contained in the rocks exposed on the continental shelf suggest that the rocks were deposited in water of bathyal depth. Thus, since late Tertiary time, rocks on this part of the continental shelf have been uplifted possibly as much as 5,000 ft.

The lithology and the faunal content of the rocks suggest that deposition during late Tertiary time occurred either on the continental slope or in one or more isolated basins somewhat removed from the continent. Subsidence contemporaneous with deposition resulted in thick accumulations of Tertiary sedimentary rocks. Late Tertiary and Quaternary tectonism resulted in the uplift and deformation of the Tertiary rocks in the area of the present continental shelf. Erosion and subsequent burial of portions of the Tertiary section occurred during late Quaternary fluctuations of sea-level.

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Monterey Submarine Canyon, California: Genesis and Relationship to Continental Geology

New data from marine dredgings off Monterey, California, correlated with wells and outcrops on land, indicate that the Pleistocene Monterey and Soquel Canyons, and the middle Miocene (?) Carmel Canyon, are intimately related to the continental geologic history.

Late Cretaceous (?), middle Miocene, and Pleistocene structure controls canyon trends whereas the induration and distribution of post-lower Miocene sedimentary rocks and the Cretaceous granodiorites control the canyon-shape parameters. Carmel Canyon was the principal canyon until the mid-Pleistocene orogeny caused physiographic and structural changes. Zones of low induration and(or) weakness along fault trends and along contacts between sedimentary and igneous rocks permitted the canyons to be more easily eroded.

Late late Miocene, Pliocene, and early Pleistocene drainage from the Great Valley debouched at Monterey Bay via Elkhorn Slough which lies at the head of Monterey Canyon. All canyon heads were cut or modified subaerially by rivers to a depth of 300 ft. below present sea-level during eustatic sea-level changes. Canyon erosion below 300 ft. was by submarine processes, as the geologic record on land indicates no great uplift of the ocean floor.

Monterey Canyon and Elkhorn Slough lie directly above a buried middle Miocene canyon—the Pajaro Gorge. The older canyon is not ancestral to Monterey Canyon, but cause-and-effect relationships are noted.

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