mal effects of the large Cretaceous intrusives. The rocks are currently being dated by Rb-Sr analyses of whole rocks. Thirteen dated samples indicate an age of 700 m.y. for the regional high-grade metamorphism of Precambrian rocks. A younger (Cretaceous?) thermal metamorphism was so severe, however, that even some whole-rock ages of Precambrian(?) granitic sills and dikes were lowered. These "reset" ages generally fall near the range of the Devonian; thus they may reflect the widespread Devonian orogeny of the Circum-Arctic basin rather than resetting by younger intrusives. Uranium-thorium ratios correlate well for Cretaceous intrusives, but not so well for Precambrian intrusives.

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Jurassic and Neocomian Paleozoogeography of Arctic

During the Jurassic and Early Cretaceous, Arctic seas were linked with the Atlantic and Pacific Oceans. Warm ocean currents penetrated from the Atlantic Ocean, resulting in greater abundance and diffusion of the marine fauna in the Atlantic part of the Arctic; this was especially pronounced during the Late Jurassic. The North Pole, as confirmed by paleomagnetic and paleobiogeographic data, was north of the Bering Strait during the whole Jurassic and Neocomian (earliest Cretaceous).

The marine fauna was only weakly differentiated during the Hettangian, Sinemurian, and early Pliensbachian (Early Jurassic). The Tethyan and Boreal provinces developed; the latter, situated around the pole, was characterized by sparser cephalopod associations and by the appearance of endemic forms (up to the family level) in the benthos. During the late Pliensbachian, faunal differentiation reached the province level. The Boreal region was differentiated into West European and Arctic provinces, which continued to exist during the Toarcian and early Aalenian. During the Middle Jurassic (from late Aalenian time), faunal diversity in the Boreal region increased sharply, with Arctic and North American provinces differentiated within this region. The West European province appears to have extended beyond the limits of the Boreal region. During the Callovian, Oxfordian, and Kimeridgean (Late Jurassic), the Boreal region again tended to form two subregions: the Arctic region which included the North Siberian, Chukotsk-Canadian, and North American provinces; and the Boreal Atlantic region which included the West European and Urals-Greenland provinces.

During the Volgian (Volzhian) and early Berriasian (latest Jurassic, earliest Cretaceous), the Boreal fauna was more isolated from the Tethyan fauna and constituted a Boreal realm with Arctic and Boreal Atlantic regions. The Arctic region included the North-Siberian, Chukotsk-Canadian (around the Pole), and Boreal Pacific provinces, and the Boreal-Atlantic region consisted of the West European, East-European, and Urals-Greenland provinces. During the late Berriasian, Valanginian, and early Hauterivian (Early Cretaceous) the Arctic region extended westward and included the Trans-Uralian region.

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Structural Evolution of Bering Continental Margin: Cretaceous to Holocene

Spreading in a broad arc from Kamchatka to the tip of the Alaska Peninsula, the Bering continental margin separates the deep Bering Sea from its fringing shelf.

Rock dredgings and geophysical data indicate that beneath a veneer of Cenozoic deposits the central sector of the margin (between Alaska and Siberia) is in part underlain by folded sedimentary strata of Late Cretaceous (Campanian) age. These rocks can be traced seaward beneath the deep basin of the Bering Sea, as well as landward to coastal exposures of Mesozoic rocks in Siberia and western Alaska. The deeply submerged Cretaceous rocks appear to be the eroded remnants of a continental margin that was uplifted and deformed in latest Cretaceous or earliest Tertiary time. We speculate that tectonism of the continental margin may be linked with the convergence of a North Pacific lithospheric plate and an American-Eurasian plate in the late Mesozoic; normal or direct convergence off southern Alaska and the Kamchatka-Koryak region where coastal mountain building was intense, and oblique convergence along the less deformed central sector of the Bering margin.

By Oligocene time the seaward fringes of the coastal mountains were beveled to low relief and submerged to form the foundation of the Neogene shelf and continental margin. Submergence was very extensive along its central sector. There narrow grabens parallel with the margin formed in response to extensional rifting and filled with as much as 2,600 m of neritic and upper bathyal deposits. Faults bordering outer-shelf basins and flanking structural highs in the central sector may connect on the west with major fractures offsetting Cretaceous rocks underlying the Koryak Mountains (Cape Navarin area). Eastward from the central sector outer-shelf structural trends appear to turn inside or north of the Alaska Peninsula rather than merge with Pacific marginal structures.

During the Neogene, 500 m or more of pelagic and terrigenous sediment accumulated over the collapsing margin. These deposits were deformed by slumping and basement faulting and, in the late Cenozoic, largely stripped from some areas by an episode of intense canyon cutting.

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Recent Sedimentation on Southern Bering Shelf

A veneer of contemporary sediments covers the entire continental shelf in the Bristol Bay region of the southeast Bering Sea. This broad shelf, covering an area of 1.5×10^5 sq km has a relatively smooth bottom and gentle slope of about 1:4,000. Nearshore sediment is gravelly, coarse sand which grades to fine sand offshore. In general, the mean size of the sediment is related to the depth. The nearshore and offshore heterogenous sediments are very poorly sorted whereas homogeneous sand in the center is well sorted. The mineralogy of sand is diverse, reflecting the complex sources: sedimentary, metamorphic, and igneous terrane of the hinterland in the north and east, and typically volcanics from the Aleutian Islands in the