depositional environmental interpretation is a sabkha near the bottom, an open marine in the middle, and shallow marine near the top representing a regression, transgression, and regression. The lowermost member of the Kaibab Formation, the Fossil Mountain, is a fossiliferous chert-bearing limestone with whole fossils and was deposited in a low-energy marine environment suggesting a transgression. Overlying the Fossil Mountain Member is the Harrisburg Member which consists of a series of alternating gypsiferous siltstones, dolomites, and limestones interpreted as having been deposited in an environment which fluctuated between a sabkha and shallow, open-marine seas.

Overlying the Harrisburg Member is the discontinuous Rock Canyon Conglomerate. It represents erosion and dissection of the Harrisburg Member and resulted from a major marine regression during Late Permian time.

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Sedimentology of Fluvial Upper Devonian Kanayut Conglomerate, Brooks Range, Alaska

The Kanayut Conglomerate, which extends across most of the Brooks Range in northern Alaska, is a widespread nonmarine clastic sequence as thick as 2,000 m. It records southwestward growth of a major fluvial-dominated coarse-grained delta. The Kanayut is underlain and overlain by fossiliferous marine strata of the Upper Devonian Hunt Fork Shale and Lower Mississippian Kayak Shale, respectively. It has been subdivided into four members, in ascending order: (1) a lower marine member, 560 m thick, consisting chiefly of sandstone; (2) a lower nonmarine member, 550 m thick, consisting chiefly of fining-upward cycles of sandstone to shale; (3) a middle nonmarine member, 450 m thick, consisting of massive interbedded conglomerate and sandstone; and (4) an upper nonmarine member, the Stuver Member, 400 m thick, consisting chiefly of fining-upward cycles of sandstone to shale. The distribution of maximum size of conglomerate clasts suggests a source area to the northeast, and paleocurrent measurements indicate sediment transport dominantly toward the southwest. The conglomerates are texturally and compositionally mature, containing primarily clasts of chert with lesser amounts of quartz, quartzite, and argillite. The sandstones are also compositionally and texturally mature, composed chiefly of subrounded grains of quartz, chert, and argillite, with negligible amounts of feldspar.

The Hunt Fork Shale, Kanayut Conglomerate, and Kayak Shale record a major progradational-retrogradational deltaic cycle. The lower marine member of the Kanayut and underlying and overlying marine units represent prodelta, delta-margin, and delta-front deposits, the lower nonmarine member and the Stuver Member of the Kanayut represents meandering fluvial delta-plain deposits, and the middle nonmarine member of the Kanayut represents braided fluvial delta-plain deposits.

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Geometry and Dispersal Patterns of Deep-Sea Fans From Various Tectonic Settings

Deep-sea fans range from small fan-shaped depositional bodies with relatively simple internal structure to large variably shaped depositional bodies with complex internal structure. Their shape depends on several important factors: (1) the topography of the basin floor and shape of the basin in which they are deposited; (2) the number and distribution of submarine canyons or sea gullies transporting sediment to the ocean floor; (3) the strength and direction of bottom currents; (4) the effects of the Coriolis force; (5) the grain-size distribution of the sediment being fed to the fan; (6) the rate of sediment supply; (7) the presence of syndepositional tectonism either along basin-margin slopes or on the sea floor; and (8) the position of the shoreline and effects of sea-level changes.

Fans in trenches can be extremely long and narrow, whereas those on flat ocean floors have more regular fan shapes. Fans fed by single submarine canyons are relatively simple, whereas those fed by sea gullies that extend outward from deltas are more complex. Bottom currents can redistribute fan deposits, and the Coriolis effect causes hooking of modern fan channels. Fans built primarily of sand from submarine canyons are highly channelized, whereas those containing a mixture of sediment sizes have well-developed non-channelized facies. The rate of sediment supply, strongly affected by sea-level changes and tectonism, provides overall constraints on the size and shape of fans.

Fans constructed along California-, Japan-, Andes-, and Atlantic-type margins have distinctive geometric, petrographic, and dispersal characteristics.

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Structural and Sedimentologic Study of Cerro Prieto Geothermal Field, Baja California, Mexico

Since 1977 the Comisión Federal Electricidad of Mexico and the Lawrence Berkeley Laboratory have cooperatively studied the Cerro Prieto geothermal field, located approximately 35 km south of the United States-Mexican border in the Mexicali-Salton trough.

As part of these studies, geophysical and lithologic well logs have been qualitatively and quantitatively studied using both manual and computer interpretation techniques. These logs were analyzed to make stratigraphic correlations throughout the Cerro Prieto field and to interpret the depositional environment of the field's lithologic units. Dipmeter and seismic data were of noted value in making stratigraphic interpretations and predictions. Cross sections were constructed to illustrate lithofacies variations throughout the geothermal field. These sections were used to construct a three dimensional model of the Cerro Prieto geothermal reservoir.

Petrographic, SEM, and X-ray diffraction analyses were made of the well bore cuttings to determine the degree and distribution of hydrothermal alteration, the origins of secondary porosity, and the relative degree of