Seismic records show that the Holocene clayey silt, which is common on much of the shelf, is thin or absent on Pamplona Ridge and in the outer part of Bering Trough. Samples from these areas, in water depths ranging from 163 to 315 m, have abundances of *E. clavatum* of 10% or more, and *Buccella* is present. This fauna may indicate deposition at shallower depths during a Pleistocene lower stand of sea level.

RAPPEPORT, M. L., U.S. Geol. Survey, Menlo Park, CA

Depositional Environments Within High-Energy Tidally Dominated Embayments Along Pacific Margin, United States

Geophysical and sedimentological studies within lower Cook Inlet, Alaska, have revealed acoustic facies relations and sedimentologic depositional environments typical of large, tidally dominated estuarine systems along the Pacific margin of the United States. Since 1976, detailed high resolution seismic and sidescan sonar surveys, bottom underwater television, and bottom photography, together with sediment sampling, in lower Cook Inlet, have delineated six major depositional environments: high-energy tidal flat; trough-edge platform; trough slope; tidal trough (channel); channel-mouth plateau; and seaward progradational ramp. Within these environments are found lithofacies ranging from sand patches, sand ribbons, and mixed cobble-sand "hard bottom" to sand-wave bodies of both large- and small-scale and to sand-wave and shell-lag complexes. These facies appear to be primarily controlled by the modern hydrodynamic regime and the availability of sediment within lower Cook Inlet.

In lower Cook Inlet at present, sands and gravels are being deposited while older glacial sediments are being winnowed. Marine transgression since glaciation has resulted in a more energetic tidal environment in the present than existed in the past. Geophysical (evidence shows that deposition has occurred over a preexisting glacial topography consisting of an irregular surface cut by numerous shallow channels. In other areas, banks of till lightly covered by recent sediments appear to nearly crop out on the seafloor. Throughout lower Cook Inlet, however, modern sediments average approximately 30 to 40 m in thickness.

Four primary acoustic depositional facies are recognized in the shallow subsurface sediments. The upper two acoustic facies can be correlated with the modern lithofacies within lower Cook Inlet. Facies A, considered to represent unsorted tills, overlies the eroded glacial surface and is up to 75 m thick. It has a characteristically nearly transparent acoustic appearance on high resolution geophysical records. Overlying Facies A is Facies B which is characterized by a strong acoustic reflection. This facies is very thin and is thought to represent glacially derived outwash gravels and cobbles. Facies C overlies Facies B and it is acoustically identified by its pattern of multiple horizontal reflectors which is thought to represent a succession of alternating layers of silt and sand. Facies C is considered to have been deposited when lower Cook Inlet was a quiet bay. The uppermost acoustic facies, Facies D, appears limited to trough, plateau, or ramp environments and is composed of large-scale sand-wave complexes. Modern analogous sand-wave complexes can be presently found in parts of lower Cook Inlet.

Willipa Bay, Oregon, and San Francisco Bay, California, exhibit modern sediment facies which are similar in some ways to those described for lower Cook Inlet. Comparison of these Pacific margin embayments in terms of hydrodynamics, sediments, constructional history, and topography has led to a general facies model for high-energy tidally dominated estuarine systems.

SLOAN, DORIS, Univ. California, Berkeley, CA

Foraminifera of Sangamon(?) Estuary, Central San Francisco Bay

Up to 30 m of muds deposited in a Sangamon(?) estuary are found in boreholes drilled for the proposed Southern Crossing of central San Francisco Bay. Microfossils and plant fragments in the core samples represent deposits of shallow estuarine and deeper marine environments.

The most abundant species is *Elphidium excavatum* (including its variants *E. selseyense, E. lidoense*, and *E. clavatum*). It occurs with *Elphidiella hannai* to comprise over 70% of the total population in all samples. *Bucella frigida, Elphidium gunteri,* and *Ammonia beccari* comprise at least 15-25% of the taxa in many samples. All other species occur with frequencies of less than 2%.

Two associations are defined: (a) one in which *E. excavatum* comprises over 50% of the total population, and *A. beccari* and *E. gunteri* are also abundant; and (b) one in which *E. excavatum* is common but less abundant, and *Elphidiella hannai* and *B. frigida* are also common. The *Elphidium excavatum* association is found in the lower samples in each core, the *Elphidiella hannai* association in the upper samples.

In the present bay, *E. hannai* is most abundant at depths greater than about 12 m, whereas *Elphidium excavatum* and associated species are the most common species at shallower depths, which suggests that the Sangamon(?) estuary was of moderate depth and gradually became deeper. The presence of *B. frigida*, a species not found in the present bay but common in inner netritic environments of the West Coast, suggests that the later Sangamon(?) bay may have had a more open-marine aspect. Foraminifera common to shallow-bay environments are apparently not preserved in the cores.

SPARKS, DENNIS M., Geo-Logic, Inc., St. Helena, CA

Geological Assessment of Petroleum Potential of Tertiary Basin, Western Oregon and Washington

Recent drilling and the subsequent discovery of gas near Mist, Oregon, have stirred new interest in the large Tertiary basin of western Oregon and Washington. Developments in the understanding of the regional tectonic framework of the western North America continental margin over the last 10 years has clarified some aspects of the geology of this area. Our new-found insight into the mobile nature of the crust provides little new indication, however, of the possible volumes of hydrocarbons in the basin.

Our current work in the area indicates little that is