formed by hydrothermal-volcanogenic processes. These deposits can be grouped into five categories on the basis of the manganese mineral assemblage, lithologic association, and tectonic setting: (1) deposits in chert-graywacke sequences (e.g., in melange of the Franciscan complex of California—lenses and beds of manganese carbonate and manganiferous opal associated with bedded chert within thick sequences of graywacke and conglomerate; (2) deposits in chert-greenstone (ophiolite) sequences (e.g., the late Paleozoic Havallah Formation, Nevada)—occurrences of Mn-jasper, Mn-oxides, and the Mn-silicates braunite, bementite, and rhodonite in lenses within bedded chert, at the interface between basalt and chert, and within basalt; (3) deposits in metachert-metavolcanic sequences (e.g., late Paleozoic to Jurassic strata of the Sierra Nevada and Klamath Mountains)—deposits that are similar in occurrence and general lithology to those in the Franciscan and Havallah sequences but that have undergone a higher grade of metamorphism, so that the manganese mineral assemblage includes rhodochrosite, rhodonite, spessartine, piemontite, and Mn-rich pyroxene and amphibole; (4) deposits in pelagic-limestone/oceanic-basalt sequences (e.g., the Eocene Crescent Formation on the Olympic Peninsula, Washington)—marine carbonate and spilitized volcanic rocks hosting a diverse manganese mineralogy dominated by silicate (e.g., bementite) and oxide (e.g., hausmannite) phases; and (5) deposits in Miocene and Pliocene sequences of conglomerate-sandstone-tuff-gypsum of the Colorado River-Lake Mead area, Nevada and Arizona—high-tonnage low-grade stratiform and largely strata bound deposits consisting mainly of amorphous manganese oxide cement in clastic sedimentary rocks.

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Geomorphology, Structure, and Geochemistry of North Fiji Basin Triple Junction

We report on the preliminary results of a marine geological/geophysical survey of the North Fiji basin triple junction, undertaken by Australia, New Zealand, the United States, and CCOP/SOPAC in April/May of 1982. This investigation, focusing on the northeastern limb of the triple junction, has helped reveal the geomorphology, and has provided an excellent opportunity for studying the geochemistry of metalliferous deposits and hydrothermal activity associated with this type of divergent margin. Station work during the 20-day cruise included coring, dredging, and bottom photography.

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Late Cretaceous Oil Shale, Southwest South Korea

(No abstract)

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Seismicity, Faulting and Tectonics of Inner Continental Borderland Offshore Northern Baja California, Mexico

Using recently collected high resolution seismic reflection data and existing bathymetric, geomagnetic, and seismological data, we find that the inner continental borderland of northern Baja California, Mexico, is extensively deformed and tectonically active. The region is crossed by three major wrench fault zones typified by one or more relatively continuous main fault(s), numerous smaller, subparallel, en echelon and oblique conjugate faults, and transversely oriented folds. These three fault zones are the southward continuations of the Santa Cruz–San Clemente–San Isidro, San Pedro–San Diego Trough–Maximinos, and Palos Verdes Hills-Coronado Bank–Agua Blanca fault zones, mapped in the southern California continental borderland. Each of the fault zones shows evidence of Quaternary activity, such as sea-floor displacement and faulted Quaternary sediments. Earthquake epicenters roughly delineate the major fault zones, with the most significant activity occurring along the Santa Cruz–San Clemente–San Isidro fault zone. Strike-slip is suggested for the main faults by offset submarine canyons, and sea-floor scarps that reverse along strike. Large scarps and vertical separations also suggest significant dip-slip in some areas. Earthquake focal mechanisms show that present-day movements along the major fault zones is predominantly dextral strike-slip, with a significant component of dip-slip in some cases, consistent with the motion of the San Andreas fault system and Pacific–North American plate boundary tectonics. Complexity in the regional tectonics is demonstrated by earthquakes in the San Clemente Island–Fortymile Bank area, which are observed to have focal mechanisms opposite to those predicted by the rigid plate theory.

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Prospects for Ocean Thermal Energy Conversion (OTEC) in the Pacific

Ocean Thermal Energy Conversion (OTEC) may be the most promising future electrical energy source for many of the Pacific nations located between 20°N and 20°S latitudes. Within this band are found the optimum physical, economic, social, and cultural conditions for OTEC development. Several of the island nation governments in this region have declared OTEC to be the preferred alternative to their existing fossil fueled power plants, the fuel for which is imported at a severe economic penalty. In addition to OTEC serving as the cornerstone of energy self-sufficiency, these nations are also attracted to the potential OTEC by-products including fresh water, mariculture, and cooling water. Their interest is also stimulated by the potential for industrial expansion and economic development based on the added electrical baseload capacity OTEC can provide. Many multi-island nations see OTEC as a modest-sized decentralized energy facility that could serve remote population centers not serviceable from large central power stations.

Many factors contribute to the prospects for OTEC development in the Pacific and there has been notable progress to date. Demonstration OTEC facilities have been built and tested in Hawaii and on Nauru. Designs, site surveys, and environmental assessments for commercial OTEC plants have been prepared for Guam, Tahiti, Okinawa, and Saipan. Planning for OTEC is underway in American Samoa, Palmyra, Yap, and the Marshall Islands. An ammonia-producing OTEC plantship has been proposed for grazing in the central Pacific. These projects illustrate the strong interest in OTEC development that is found throughout the central Pacific.