be built to manage, distribute equitably, and share cooperatively in the wealth these resources will provide.

The total set of monetary systems in the Pacific is perhaps more numerous and more complex than those in the western hemisphere. The mysteries of the Soviet and Chinese monetary systems must be made compatible with the intricacies of the yen and the dollar. Associated with these monetary policies are economic and political policies of the Circum-Pacific nations which themselves will have difficulties in interfacing and interacting without generating misunderstanding and conflict.

Central to the solution of the dilemmas posed by such interactions is the development of truly effective consultative organizations. If the nations are unable to develop such mechanisms, we may find the development of international corporate and cartel structures as the only alternative to achieve a viable development of the resources. History has shown that such cartels are in the long run internationally unacceptable and are unable to operate for the benefit of the consuming populations. It is clear that the energy and minerals crunch is proceeding at such a pace that an international consultative mechanism must develop either among nations or among corporations. In this sense, there is an international situation that can be said to be a Trans-Pacific consultation crisis. The solution to this crisis requires more than a formal organization it also requires the development of consultative mechanisms which permit rapid education and reeducation of participating states, opportunities for assessment and reassessment of national policies, rapid means of communicating unofficially the trend of these policies, and the development of the rapid feedback mechanisms which are required to prevent "shokus" and other economic and political dislocations and confrontations.

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MAGMATOP—ULTIMATE GEOTHERMAL ENERGY PROGRAM

No abstract available.

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MINERAL RESOURCES OF STATE OF SINALOA, MEXICO

The regional geologic mapping carried out during the last years in the State of Sinaloa by geologists from the Instituto de Geologia de la UNAM brings new knowledge to the economic-geologic research of the state and provides help to the economic development of Mexico.

The five main groups of mineral deposits in the area may be divided, on the basis of their characteristics, as follows: (1) Hydrothermal (epithermal; cavity filling); (2) Metasomatic (contact metasomatism; acid igneous rocks—dissemination); (3) Contact metamorphic (contact metamorphism); (4) Magmatic or primary (dissemination in ultramafic or mafic rocks); and (5) Other (deposits by mechanical concentration in clastic formations; residual and alluvial).

The important ages for metallic concentration were Jurassic, Late Cretaceous, early, middle, and late Tertiary, and Pleistocene.

The present paper describes the relations between the lithologic units and structure and their relation to mineralization.

Most frequently mineralized are the volcanic rocks, chiefly those of intermediate composition. Similarly, other host rocks are the Albian-Cenomanian carbonate rocks. Mineralization is more abundant in andesites, even though carbonated host rocks have developed many mineral deposits in the area.

The mafic and ultramafic rocks show serpentinization at several localities and include nickel, platinum, and antimony minerals.

Clastic continental Tertiary formations contain radioactive minerals in the northern part of the state.

Recent residual deposits often contain gold-placer deposits; Paleozoic host rocks contain gold, silver, zinc, and lead mineralization.

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METALLOGENESIS IN SOUTHEAST PACIFIC OCEAN: NAZCA PLATE PROJECT

Under the auspices of the International Decade of Ocean Exploration (IDOE) the Hawaii Institute of Geophysics, Oregon State University, and representatives of several South American countries are investigating relations between plate tectonics and metal deposition on the oceanic Nazca plate. Detailed studies are being focused on the margins of this plate because metalliferous sediments form extensive deposits on and near the East Pacific Rise on the west and because vast hydrothermal deposits of metals are localized in the Andean Cordillera of the adjoining continental plate on the east.

Metalliferous sediments of the Nazca plate are enriched in iron, manganese, copper, nickel, zinc, silver, molybdenum, and lead, and share chemical, mineralogic, and possibly genetic similarities to deposits cored elsewhere by the Deep Sea Drilling Project. These sediments are demarked especially by an extensive basin, the Bauer Deep, about 800 km east of the East Pacific Rise. Elemental and isotopic data, supported by geologic information from core and geophysical data, suggest that the metals enriched in these sediments originated by the interaction of volcanism and sea water, by precipitation from sea water alone, and possibly by deep-ocean physical processes acting on detritus transported either from the continents or from the basaltic East Pacific Rise.

Previous investigators have noted the coincidence of calc-alkaline magmatism and metallogeny at convergent-plate boundaries. Because the Andean Cordillera contains large reserves of copper, iron, lead, molybdenum, silver, tin, zinc, and other metals, an additional objective at the eastern margin of the Nazca plate is to relate metals of the oceanic sediments to those of the continental deposits via intermediate processes of subduction, anatexis, and remobilization. Evaluation of this hypothesis is based on the definition of important chemical parameters for sediments, igneous rocks, and ores. Preliminary results are conflicting, at best.