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within the belt are of different size, age, and relief. Some contain oil and gas and account for almost one third of world oil production. These basins contain thick sedimentary sequences which form lens-like bodies. Sedimentary basins in which the sediments are more than 3-3.5 km thick generally contain oil and gas.

Tectogenesis is the leading process in the origin and formation of sedimentary basins and their transformation to oil and gas basins. Therefore, when classifying them, one should be guided by the tectonic setting of basins.

All basins in the Circum-Pacific belt can be divided into five groups. The first group includes basins at the junction of the Circum-Pacific belt with ancient platforms. Such basins are composed of thick Mesozoic, Cenozoic, and some Paleozoic sequences and contain oil and gas.

The second group is connected with intermountain areas. These basins usually are on continental-type crust and contain Mesozoic and Cenozoic sequences 3-5 or more km thick. This is the most numerous group including more than 70 basins.

The third group includes pericontinental folded basins at the junction of folded continental structures and oceanic floor. They are mainly along the American Pacific Coast and contain great thicknesses of predominantly Cenozoic deposits.

The fourth group includes perioceanic basins connected with island arcs. These basins may be between an island-arc uplift and an oceanic floor or in a deep-sea depression.

The fifth group includes intraplatform basins, which are rare and are chiefly within the East Australian Paleozoic folded belt.

The main criterion for oil and gas content is the thickness of sedimentary rocks. The function of the thickness is the degree of katagenetic transformation of dispersed organic matter in the subaqueous part of the sedimentary section. All sedimentary basins more than 3.5 km thick contain oil and gas fields, irrespective of their hypsometric position.

The thicknesses of the rock sequences, rather than faults, control oil and gas content. No distinct relation has been observed between oil and gas accumulation and the position of lithospheric plates defined by "the new global tectonics" concept.

BYKOVSKAIA, E. V.

MAIN FEATURES OF SOVIET FAR EAST ACID VOLCANISM

No abstract available.

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PORPHYRY COPPER DEPOSITS OF SOUTHWEST PACIFIC—DISCOVERY AND DEVELOPMENT

In the Southwest Pacific, extending from the Philippines south, economic porphyry copper deposits are known in the Philippines, Sabah, Irian Jaya, Papua, and Bougainville. Other deposits, either uneconomic under present conditions or not yet proved to be economic, are known in Sulawesi, New Guinea highlands, New Britain, New Ireland, Manus, Guadalcanal, Fiji, eastern Queensland and New South Wales, and New Zealand.

The economic deposits are associated with Tertiary to late Quaternary intrusives of the western rim of the Circum-Pacific mobile belts, including the major west-northwest offset trending through the Solomons and New Guinea to Sulawesi.

The first significant mining opportunity was recognized in the Philippines in the mid 1950s. Since the early 1960s the rate of discovery and development of these deposits has increased rapidly as a result of a deliberate search in favorable geologic environments.

Favorable conditions of terrain and rainfall, and the size of the deposits have made geochemical stream-sediment sampling an ideal technique for exploration and delineation of porphyry coppers.

To varying extents in different parts of the region, remoteness, rugged terrain, high rainfall, shortage of skilled workers, shortage of local capital, and rapidly evolving political institutions have influenced the evaluation and development of these deposits.

Because of the large scale of the projects, their location, and the generally low-grade ore, economic evaluation has been expensive and has been carried out with great care. Porphyry copper projects are capital intensive and therefore investors require confidence in the political future.

Such projects can produce quick economic benefits to a developing country, such as capital inflow, export income, government revenue, and improved opportunities for employment and training. They can lead also to economic distortions such as local inflation and drawing away of the few skilled workers from other parts of the country.

The social and political impact of establishing a porphyry copper project in an underdeveloped community can be immense because of the requirement for access roads, the highly technical nature of the operations, introduction of expatriate workers, requirement for significant land areas, and extraction of natural resources.

The long-term success of any project will depend on the understanding with which such problems are handled by both the operating company and the host government.

CHUDOLEY, K. M., M. A. RZONSNICKAJA, O. I. NIKIFOROVA, *et al.*

PALEOBIOGEOGRAPHIC ATLAS OF PACIFIC MOBILE BELT AND PACIFIC OCEAN

No abstract available.

CLARK, A. L.

CIRCUM-PACIFIC MAP PROJECT

P 127

No abstract available.

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TRANS-PACIFIC CONSULTATION CRISIS

The discovery and technical development of hydrocarbons, minerals, geothermal energy, hydrogeology, and coal in the Pacific will be a technical challenge of great complexity. The total-systems consideration which will be faced in the development of any of these resources may match in complexity such things as the advance systems in weaponry and in space. These complexities, however, are far more manageable than the complexities of the institutions which must

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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.

COLP, J. L.

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.