

Proterozoic and lower Paleozoic strata in the cordillera comprise an assemblage of clastic and carbonate with minor volcanic rocks that appears to represent a continental-terrace wedge built along the margin of an earlier Precambrian continent. All units show a distinct polarity of facies distribution and thickness relative to the source area. This assemblage contains most of the known stratiform mineral deposits of gypsum, iron, copper, zinc, and lead in the cordillera.

The distinctive elements of a Late Devonian and Early Mississippian assemblage suggest, at least in the northern cordillera, the presence of a foredeep and related source areas in the west and northwest. In the southern and eastern parts of the cordillera, however, the rocks reflect a continuing shelf-platform environment linked to the craton. The mineral potential of these rocks has been considered low but needs further study in view of an important zinc-lead deposit in eastern Selwyn basin.

Distinctive rocks of oceanic character ranging in age from Mississippian to Middle Triassic underlie parts of the cordilleran intermontane belt. The important mineral deposits in these rocks include asbestos deposits in ultramafic rocks in the northern cordillera. Generally, however, mineral discoveries, other than those in ultramafic rocks have been few. In the eastern cordillera a shelf environment prevailed.

The association of copper with volcanic rocks of Late Triassic and Early Jurassic ages is well known. The volcanic rocks, together with spatially and temporally associated plutons, are thought to outline a system of evolving island arcs probably roughly coincident with the mapped distribution of these rocks. Between the arcs and the craton, strata were deposited in a marginal basin with little or no evidence of the volcanism that occurred farther west.

The remaining stratigraphic units, ranging in age from Early Jurassic to the Cenozoic, are described as successor-basin and foredeep assemblages whose distribution and lithology reflect a close relation to bounding uplifts of metamorphic and plutonic terrains. Because they are a late-stage phenomenon in the evolution of the cordillera these assemblages have potential for a variety of placer deposits. They also contain all of the known coal reserves of the region.

GANESHIN, G. S., *et al.*

#### CLASSIFICATION OF SHELVES AROUND PACIFIC

No abstract available.

GLASBY, G. P., New Zealand Oceanog. Inst., Dept. of Scientific and Industrial Research, Wellington, New Zealand

#### EXPLOITATION OF MANGANESE NODULES IN SOUTH PACIFIC

Manganese nodules in the South Pacific are mainly in the following regions: an elongate belt approximately 1,000 km wide beneath the Antarctic Circumpolar Current; the Southwest Pacific basin; the Peru basin; the Chile basin; and the mountain region bounded by the Cook Islands and Tuamotu Islands. Metalliferous sediments are present dominantly along the crest of the East Pacific Rise where nodules are largely absent. The distribution patterns suggest that the formations of manganese nodules and metalliferous sediments are

mutually exclusive. Modes of origin of the nodules are suggested and the possibility of economic exploitation of the nodules discussed.

GROVER, J. C., Consultant, Australia

#### BACKGROUND TO PRESENT MINERAL SEARCH IN BRITISH SOLOMON ISLANDS AND FIJI

The effects of earlier mining policy have inhibited exploration. In both countries government geological surveys were established amid hopes that geologists might supplant prospecting activity by private enterprise, a view that matured over the years in the face of reality. Long-range ground exploration, with continued support and technical collaboration from London, produced geologic maps. Modest finances demanded a basic philosophy differing from the advice from the private sector, but outstanding results were produced which even better complemented and supported the role of private enterprise in resources development.

In the Solomons, the situation demanded the evolution of a dynamic role for government. Unprecedented support, from many sources, and international collaboration in a series of ventures led to a buildup in fundamental exploration which deployed scientists, engineers, army personnel, research vessels, and ships of the Royal Navy. Nickel and other minerals were found and drilled. Activity culminated in a regional preinvestment airborne geophysical survey with shipborne and ground follow-up teams of competent indigenous staff and bearers, each team led by a scientist, and involving an expenditure in excess of a million dollars. There were successes and shortcomings. Copper and bauxite were the main discoveries. The knowledge was applied later to Fiji where a different approach was needed.

Fiji's mapping progress and observations suggested the need for complementary activity by the private sector. Copper mineralization suggesting porphyry-type potential was described in an official letter to more than 80 major mining companies of the world and was supported by press advertisements. The mining companies were not interested. Three replies were received in 11 months. The government decision led to the discovery of anomalies and large deposits now being test drilled. Other mineral occurrences are also mentioned.

The remaining 5,000 sq mi of the main Fiji Islands was the subject of a decision in the same year. Within well-informed mining policy guidelines, agreement was reached with a highly skilled research group for the expenditure of \$2,000,000. The methods and the outcome are described.

Hopes of financial independence now are held where there had been none. The need for a well-informed governmental role in resources development is emphasized as a means to national self realization. Mention also is made of the adjoining New Hebrides and the unusual petroleum potential of the Kingdom of Tonga.

HADIKUSUMO, D., and L. PARDYANTO, Geol. Survey of Indonesia, Bandung

#### GEOHERMAL POTENTIALS IN INDONESIA

Since 1969, beginning with the first year of the First Five-Year Development Program, prospecting for geothermal resources has been carried out by the Geo-