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Abstracts of Papers

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Neogene Molluscan Stages of Oregon and Washington

A series of six marine molluscan stages—in ascending order, the Juanian, Pillarian, Newportian, Wishkahan, Graysian, and Moclipsian—are present in the provincial Neogene of Oregon, Washington, and western British Columbia. These Miocene and Pliocene stages are based upon a synthesis of new and already published biostratigraphic data on sublittoral (neritic) molluscan assemblages from marine formations exposed in the Newport embayment of northwestern Oregon and the Grays Harbor and Straits of Juan de Fuca basins of western Washington. Heretofore, the informal molluscan chronology of southern California had been utilized in correlation of Neogene sequences of the Pacific Northwest States and western Canada but the results were notably unsatisfactory owing to restricted faunal distributions during the Neogene. The newly described molluscan stages facilitate interprovincial correlation with the Gulf of Alaska Neogene formations in the northwest and with California Neogene basins in the south.

ANDERSON, DAVID N., State Energy Commission,
 Resources and Development Div., Sacramento, Calif.
 Update of Geothermal Resources and Development in
 California and Northern Mexico

Since 1960, when the first power plant went on line at The Geysers, geothermal development in California has been increasing steadily. By 1975, more than 200 geothermal exploratory and development wells had been drilled in 10 different areas of the state. Federal lands now are being leased and exploratory activities are under way in more than 20 areas. Power-plant construction at The Geysers has been delayed, but permits for two to four additional plants should be issued in 1976.

Exploration and confirmation drilling in the Heber area of the Imperial Valley has led to the scheduling of a power plant in 1980. Many research projects for utilization of the high-saline reservoir at Niland should bear fruit. Development of geothermal resources at Sierra Prieto, Mexico, is under way and expansion of the power-generating facilities is now in progress.

Environment, legal, and institutional problems have slowed, and probably will continue to slow, development in all areas in California in the near future. However, a concerted effort is under way by the state and federal governments to resolve these problems. Utilization of low-temperature geothermal resources is just getting under way. The total geothermal potential of the state still is unknown, but exploratory drilling scheduled in the coming year should help to answer this question.

ARNAL, ROBERT E., and JOHN G. VEDDER, U.S.
 Geol. Survey, Menlo Park, Calif.

Late Miocene Paleobathymetry of California Continental Borderland North of 32°

Dart and gravity cores taken along the crests and flanks of present ridge systems in water depths of 1,000 m or less on the California continental borderland have provided a paleontologic basis for determining depth zonation in late Miocene strata. Using foraminifers as water-depth and time indicators, in combination with other criteria established during previous studies, seven biofacies are recognized that equate to seven paleobathymetric zones from the strandline to an excess of 2,500 m of water depth.

Bathyal depths generally prevail throughout late Miocene time. Early Mohnian foraminiferal assemblages indicate water depths ranging mostly from sublittoral to middle bathyal zones but late Mohnian Stage assemblages suggest lower bathyal environments of deposition. Thus a deepening trend is inferred for the present ridge and flank area during late Miocene time.

BALDWIN, THOMAS A., Consulting Geologist, Al-
 tadena, Calif.

Salinas Valley Today and Tomorrow

More than 100 wildcat wells were drilled unsuccessfully in the Salinas Valley area prior to the discovery of the San Ardo field in November 1947. By 1951 the field was outlined fully and reservoir engineers estimated that reserves of between 50 and 100 million bbl of heavy oil would be recovered from the 2 billion bbl in place. Since the discovery of San Ardo more than 150 additional exploratory wells have been drilled in the basin without any substantial discoveries, but thermal-recovery processes and higher prices have increased greatly the field reserve. About 275 million bbl of oil have been produced and it appears probable that a similar volume will be produced in future years assuming a continuation of a favorable economic climate. As no expansion of producing area nor discovery of new zones occurred between 1952 and the present, the San Ardo experience suggests that not only will "tomorrow's oil come from today's provinces" but that it well may come from yesterday's oil fields.

BARNES, DAVID F., U.S. Geol. Survey, Menlo Park,
 Calif.

Gravitational Evidence for More Alaskan Sedimentary Basins

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BARRON, JOHN
 Calif.

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BIRD, K. J., U
 Environmental

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