and 1.5 miles wide. The bay is bordered on the northwest by post-glacial marine deposits that have been modified into cuspate projections. Remnants of kames and moraines form the border on the east and south. Most of the bay is not more than 12 feet deep, but 3 basins range in depth from 24 to 30 feet.

Sediments are composed of gravel, sand, silt, clay, and shell debris. Excess current energy of incoming over outgoing tides causes shell debris to accumulate where otherwise only fine sediments might be expected. In some areas, calcium carbonate content of fine sediments is high due to large foraminiferal populations. Therefore, calcium carbonate percentage is high in both coarse and fine sediments, whereas organic carbon and nitrogen are high only in fine sediments. Quartz is the major constituent of the sands; larger grains are characteristically well rounded and frosted.

ALFRED R. LOEBLICH, JR., California Research Corporation; HELEN TAPPAN, University of California at Los Angeles: Foraminiferal Facts, Fallacies and Frontiers

Erroneous statistics applied to foraminiferal studies have resulted in misleading statements. The notorious volume of publications is a figment of thorough bibliographic documentation. The degree of classification and number of foraminiferal taxa are relatively conservative as compared to other invertebrate groups.

Unjustified interpretations have resulted from misapplication of concepts originally developed for metazoan invertebrates or vertebrates. Geographic "subspecies" can not be differentiated on size variation, as this results from environmentally controlled delay or acceleration of the reproductive cycle. Prolonged vegetative growth, with delayed cycle, results in robust specimens, thus to be expected with depauperate invertebrate faunas. Abundant material lessens the necessity of statistical methods of determining population characteristics from a few specimens. Evidence of floating bottles used in ocean current studies, even with the present relatively emergent continents, shows the migration time for planktonic species to be negligible. Effective rate of evolutionary changes in foraminifera is relatively rapid, due to short life span, abundant progeny, and rapid production of new generations.

Many detailed faunal and biostratigraphic studies are needed, as are studies of interrelationships of benthonic faunal facies and planktonic faunal zones. For many genera and families, little is known of gross external and internal test morphology and wall microstructure or morphology, physiology, genetics, life cycle, and ecology of the living animal.

WILLIAM W. LUMSDEN, Long Beach State College; TAKEO SUSUKI, University of California, Los Angeles: Middle Cambrian Section in Vicinity of Currant Creek, Nevada

A regional study of the White Pine Range, east-central Nevada, has disclosed in the vicinity of Currant Creek a previously undescribed Middle Cambrian section. Approximately 4,000 feet of strata composed dominantly of thin-bedded limestone and shales, lies directly above the Lower Cambrian Prospect Mountain quartzite, and below the Upper Cambrian Dunderberg formation.

Though faulted, the section has yielded rich trilobite faunas representing in ascending order the Middle Cambrian zones: *Albertella*, *Glossopleura* and *Bathyuriscus-Elrathina*. The *Bolaspidella* zone may be present but is not recognizable because of structural complexities and scarcity of fossils.

The Currant Creek section has been compared with that of the Pioche District, Nevada; House Range, Utah; and the Bear River Range, Utah-Idaho. Comparisons indicate that the *Albertella* zone of Currant Creek is similar to that of the Upper Pioche shale, Highland Peak Range, and the Naomi Peak limestone member of the Langston formation, Bear River Range. The *Glossopleura* zone is particularly well-developed in the Currant Creek section and the faunal assemblage is remarkably similar to that of the Spence shale of the Bear River Range. It may represent a westward extension of the extracratonic faunal environment postulated for the Spence shale and Langston limestone.

JAMES R. MCNITT, California Division of Mines: Exploration and Development of Geothermal Power in California

From 1955 to 1962, approximately 40 wells have been drilled in 13 California thermal areas. Twenty-four of the wells were drilled in the three areas which at present seem to have the greatest potential for production of natural steam: The Geysers, Sonoma Co.; Casa Diablo, Mono Co.; and the Salton Sea area, Imperial Co.

In light of data from these three areas, three fundamental problems of geothermal power development can be considered: (a) preliminary evaluation of a thermal area; (b) locating exploratory wells; and (c) estimating steam reserves. Preliminary evaluation of an area is usually based on natural surface heat flow. By drilling wells in a thermal area, however, the heat flow may be increased from 3 to more than 100 times the observed natural surface heat flow, depending on the permeability and structural characteristics of the thermal fluid reservoir, as well as the initial enthalpy of the thermal fluid. The efficiency of well location can be greatly increased by geophysical methods, including gravimetric, magnetic, resistivity, and thermal. Steam reserves and life expectancy of the field depend on rates of heat and fluid flow in an open system rather than on the more familiar condition of mechanical equilibrium associated with a sealed petroleum reservoir.

BRUCE D. MARTIN, University of Southern California: Rosedale Channel—Evidence for Late Miocene Submarine Erosion in Great Valley of California

West of Bakersfield in the Great Valley of California, 8 wells drilled below the Upper Miocene-Middle Miocene boundary penetrated an anomalous sequence of middle Late Miocene (Middle Mohnian) sediments, principally sandstones. These coarse sediments, within the widespread lower Fruitvale Shale of early Late Miocene age (Early Mohnian), are interpreted to be fill within an early?—Middle Late Miocene submarine canyon eroded and filled during a time interval of about 700,000 years. The names, Rosedale Channel and Rosedale Sandstone, are proposed respectively for the canyon and the fill.

Electric log correlations, microfossil data, and sedimentary characteristics are used for interpretation. Only a remnant of the originally more extensive canyon is described, owing to difficulties encountered in the recognition of the headward and seaward extensions. Seismic data are inadequate for recognition.

Microfossils show that filling occurred entirely in the marine environment in a depth of water probably greater than 1,300 feet. *Uvigerina subperegrina* and *Cyclammina sp.* in the channel fill attest to this depth during the time of deposition of the Rosedale Sandstone.

The ecology of the foraminifer *Epistominella "Pulvinulinella" gyroidinaformis* in the lower Fruitvale Shale, the regional stratigraphy suggesting little or