subsidence to middle bathyal depths occurred during Late Miocene (Delmontian) and Early Pliocene (Repettian) time. Rapid shoaling during the Pliocene is evidenced by the systematic appearance of slope, shelf, and neritic foraminiferal faunas. Abundant Pliocene macrofossils also characterize shelf-depth deposits. Shallow-water micro and macrofaunas within deep water sediments are interpreted as displaced by turbidity currents or slumping. Planktonic Foraminifera and an increase in radiolarian (*Spumellina*) diameter suggest cool surface temperatures during the Late Miocene and increasingly warmer temperatures in the Early Pliocene.

EDWARD C. JESTES, University of California at Los Angeles: Stratigraphic Study of Some Eocene Sandstones, Northeastern Ventura Basin, California

The eastern end of the Matilija Sandstone and its inferred equivalents across the Santa Ynez and Pine Mountain faults were studied. These bodies of arkose have similar average modal compositions of quartz (31%), K-feldspar (21%) and plagioclase (22%). Accessory minerals also suggest derivation from a granitic basement complex. A few grains of serpentine and chert may reflect a minor contribution from a Franciscan terrane.

Depositing currents flowed mainly northwest, especially in the center of the basin. Influx of sand was probably from southern and (or) southeastern quadrants on the south side of the basin and from the northeast on the north side of the basin.

Local sand bars may have caused brackish-water environments on the southern and northern sides of the basin. The evidence is particularly strong in the area north of Pine Mountain. Coarse-grained, conglomeratic arkose with giant cross-stratifications are interbedded with strata containing shallow offshore mollusks and probable brackish-water mollusks.

Grain size and bedding thickness generally vary in direct proportion to each other. Thicker beds are usually in the thicker sections. Maximum areas of sand deposition appear to have swung back and forth producing overlapping lenticular lobes pointing into and down the basin.

Z. V. JIZBA, California Research Corporation; W. S. CAMPBELL, Standard Oil Company of California; T. W. TODD, University of California, Davis, California: Study of Core Resistivity Profiles and Their Bearing on Dipmeter Survey Interpretation by Computers

Bedding features in cores have been compared with corresponding dipmeter log curves. Special equipment was constructed to insure a correct match for this comparison. Results suggest that occasionally apparent good picks from a dipmeter log may not correspond with actual bedding planes. The converse can also be true: valid bedding features may not have a diagnostic expression on the log. Correlations selected on the basis of peak or valley location on the dipmeter curves may provide misleading information. We may conclude that, before we can confidently process dipmeter data by means of automated computer techniques, we must be assured that our knowledge of the relationship of rock-character to dipmeter-curve development is correct and founded in fact.

THOMAS R. LAFEHR, Stanford University: Gravity and Crustal Structure in Eastern Snake River Plain, Idaho

Gravity studies have been useful in volcanic regions where buried geologic features are partly concealed by overlying lava flows. In the Snake River Plain, Idaho, recent geophysical investigations by the U. S. Geological Survey have revealed a marked contrast between the structures of the western and eastern parts of the plain. The western plain is a deep graben, whereas the eastern plain is a downwarp or shallow graben. Depth-estimation formulas and numerical integration techniques have been used to interpret the gravity anomalies. The gravity pattern in the east implies relatively shallow subsurface elongate mass distributions whose long axes seem to trend parallel to the axes of the adjoining mountains. Residual anomalies suggest that the basalt may be only a few hundred feet thick at places in the eastern plain, and that the total accumulation of lava has been much less in the east than in the west. The U. S. Geological Survey is continuing its study of this region with the aid of seismic-refraction data obtained from both chemical and nuclear explosions.

STANLEY J. LASTER, RICHARD SCHELL, MILO M. BACKUS, Geophysical Service, Incorporated: Analog Model and Synthetic Seismogram Studies of Long Range Refraction Method

Refraction mapping of a simple anticline in a high velocity halfspace overlain by low velocity overburden in an analogue model illustrates the conventional refraction method and the behavior of refraction traveltime and amplitude. In addition to first arrivals, the later arrivals on the seismogram, the "multiple refractions," which constitute the P_L mode in the reflection noise problem and long period earthquake seismograms, were studied in detail. In the absence of structure, the behavior of the later refractions on the model agrees with the predicted behavior from exact synthetic refraction seismograms obtained from the computer application of Cagniard's method to a layered half-space. Over the structure, the arrival time and amplitude behavior of the later arrivals is simply diagnostic of the structure.

ROBERT J. LESLIE, University of Southern California: Sedimentology of Hudson Bay, Canada

Bottom sediment distribution in Hudson Bay is a reflection of the water circulation pattern within the bay, tidal currents, and ice rafting. There is a gradual decrease in sediment size from coarse sand and gravel on the west to clay near the eastern coast. Adjacent land topography is not a major factor in sediment distribution since the eastern coast is much more rugged than the lowland area on the west. Ice rafting is an important agent of sedimentation in the shallow regions of the bay, and exerts its greatest influence in the areas off the western coast and around Southampton Island. The large central part of the bay is not influenced greatly by rafting.

Organic content in the sediment is highest in the fine-grained material off the east coast. Calcium carbonate content is greatest in sediments of the southwestern portion of the bay, in the region bordered and underlain by Paleozoic carbonate rocks. The surface sediment in the deeper central part of the bay is reddish brown in color. Origin of the red layer, which has a maximum thickness of 8 cm. is due to oxidation caused by the slow settling of ferruginous sediment in highly oxygenated water. This red surface layer is a common feature in the north and has been reported from the Kara, Barents, and White Seas.

LOUIS LIDZ, Allan Hancock Foundation, University of Southern California: Sedimentology of Nantucket Bay, Massachusetts

Nantucket Island is a Pleistocene terminal moraine which encompasses a bay approximately 7 miles long