truncatulinoides, and *G. inflata,* in ancient Californian sediments should lead to a better understanding of paleobasin oceanography by making it possible to determine sill depths and oxygen minimum distributions. Such studies have obvious applications in the determination of petroleum source rocks, because organic material is preserved in anaerobic conditions but destroyed in aerated sediments.

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MIDDLE TERTIARY STRATIGRAPHY OF SANTA ROSA ISLAND, CALIFORNIA

(No abstract submitted)

DAVID DOERNER, Dept. of Geology, Univ. of California, Santa Barbara, Calif.

PALEOGENE SEQUENCE IN NORTHERN CHANNEL ISLANDS, CALIFORNIA

Cretaceous and/or lower Tertiary marine sedimentary rocks crop out on the three major northern Channel Islands. Study of the rocks and their contained foraminiferal assemblages reveals many faunal and lithologic similarities between these three islands.

On Santa Cruz Island foraminiferal assemblages indicate that deposition of Cretaceous and Paleocene strata took place in a shallow-water marine basin which became continuously deeper during Eocene time until lower bathyal depths were present by the end of late Eocene time. Sedimentary structures and textures, as well as lateral thickening of strata, suggest source areas on the north or northeast.

On Santa Rosa Island, where the oldest rocks exposed are of middle and late Eocene ages, foraminiferal assemblages indicate a similar deepening.

On the west, however, foraminifers from Cretaceous and early Tertiary strata of San Miguel Island indicate continuous deep-water conditions and open-ocean circulation during Cretaceous, Paleocene, and Eocene times.

The writer suggests that all three depositional sites were part of a single basin or two closely contiguous basins with a northwest-southeast axial trend.

S. ROBERT BERESKIN, Dept. of Geology, Univ. of California, Santa Barbara, Calif.

MIOCENE BIOSTRATIGRAPHY OF SOUTHWESTERN SANTA CRUZ ISLAND, CALIFORNIA

A 2,265-ft conformable sequence of marine conglomerate, sandstone, and mudstone crops out along continuous sea-cliff exposures on southwestern Santa Cruz Island. Disconformably overlying rocks of late Eocene age, the Vaqueros Sandstone, the Rincon Formation, the San Onofre Breccia, and the Monterey Formation contain mollusks and foraminifers, which indicate the presence of a Miocene sequence of Zemorrian through Mohnian(?) ages.

The southwestern corner of the island is structurally represented by a doubly plunging anticline trending approximately N40°W. Outcrops of the Vaqueros, Rincon, and San Onofre formations are on both the southwestern and northeastern limbs of the fold enveloping a Paleocene-Eocene core. The Monterey Formation is exposed only on the southwestern limb and, although this unit is not lithologically identical to the typically siliceous Monterey Formation on the mainland, it can be correlated with these mainland exposures on the basis of fossil Foraminifera. Paleoecologic and paleotopographic studies based on field relations and foraminiferal paleoecology indicate that the shallow part of the basin was on the east or northeast, and that the deeper areas extended westward and perhaps southward.

SEG TECHNICAL PROGRAM SUMMARY

THURSDAY AFTERNOON, MARCH 27

1. R. L. MAXWELL, P. A. GAECHTER: Geophysical survey application of Doppler sonar navigation
2. G. B. MORRIS, R. W. RAITT, G. G. SHOR, JR.: Velocity anisotropy of upper mantle
3. THANE H. MCCULLOH: Oil fields, gravity anomalies, and surface chemical manifestations—correlations, causes, and exploration significance
4. JOHN K. ALDRICH: Gravity of northern Channel Islands
5. E. BERKMAN, J. R. LAFFHR: Bouguer reduction technique for surface ship gravity meter data

FRIDAY MORNING, MARCH 28

1. M. D. CARTER AND OTHERS: Applications of continuous reflection parameter selection
2. J. M. HORNSBY: Seismic record section at depth
3. C. H. DIX: Searching for stratigraphic traps
4. MILTON DOBRIN: (Title to be announced)

FRIDAY AFTERNOON, MARCH 28

5. H. GARY GREENE: A portable refraction-seismography survey of gold placer areas near Nome, Alaska
6. RICHARD TAGG: (Title to be announced)
7. W. E. BALES, L. D. KULM: Structure of continental shelf off southern Oregon
8. L. D. KULM, W. E. BALES: Shallow structure and sedimentation on upper continental slope off southern and central Oregon
9. LEE C. BENNETT, JR.: Continuous seismic profiling on continental shelf off Washington

ABSTRACTS OF PAPERS

(in order of presentation)

ROBERT L. MAXWELL and P. A. GAECHTER, Marquardt Corp., Los Angeles, Calif.

GEOPHYSICAL SURVEY APPLICATION OF DOPPLER SONAR NAVIGATION SYSTEMS

Recent developments in Doppler sonar-velocity-measurement techniques have made available a new navigational aid for marine survey operations. This paper describes the capabilities of the Marquardt Doppler sonar system. A description of currently available equipment, a summary of its performance in the operational marine environment, and applications of this equipment to geophysical survey navigation also are presented.

G. B. MORRIS, R. W. RAITT, and G. G. SHOR, JR., Univ. of California, San Diego, and Marine Physical Laboratory of Scripps Institution of Oceanography, La Jolla, Calif.