the Ocean City and Quillayute Formations. A late Miocene age for these rocks is supported by the presence of *Rotalia garveyensis*, *Uvigerina hootsi*, and *Pulvinulinella gyroidinaformis*.

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STRATIGRAPHY, STRUCTURE, AND OIL POSSIBILITIES IN MONTEREY AND SALINAS QUADRANGLES, CALIFORNIA

The 7,900-foot-thick Cenozoic section in Monterey and Salinas Quadrangles, northern Santa Lucia Mountains, lies on Mesozoic granite and Paleozoic (?) Sur Series schist. Age of the 1,100-foot-thick Carmelo Formation is confirmed by new micro- and megafossil material. Eocene and Oligocene rocks are missing from the section. An 850-foot-thick middle Miocene sandstone-conglomerate formation of two members, containing a typical Temblor fauna, is assigned new member and formation names. Conformably above it is the Monterey Formation consisting of three mappable members: a lowermost Luisian sandstone, up to 200 feet thick; a Luisian through Mohnian siliceous shale, 2,000 feet thick; and an uppermost Delmontian diatomite, up to 800 feet thick. A 60-foot-thick olivine basalt lies between the Monterey and underlying Temblor-age formations, dating this volcanism as middle Miocene. Conformably overlying the Monterey Formation is the Santa Margarita Formation, up to 1,600 feet thick.

Choice of the Monterey vicinity as the type locality of the Monterey Formation was unfortunate because the section there is not typical of the Monterey Formation in well-known localities elsewhere in California, either in age, thickness, or completeness. A few miles east of the type section, the shale and diatomite members of the Monterey Formation begin to interfinger with the Santa Margarita Formation and the entire Miocene section grades into sandstone against the Sierra de Salinas.

Overlapping the Miocene and basement units is the Plio-Pleistocene Paso Robles Formation, up to 500 feet thick, and several thin younger Quaternary units.

The structural pattern is essentially a series of northwest-trending open folds punctuated by the development of three horsts. Several Miocene units are warped over the noses of these horsts. The sense of movement on the northwest-trending faults is normal and strike-slip; thrusting was not identified.

The best possibilities for oil are possible fault-stratigraphic traps along the western side of the Salinas Valley, northeast of the projection of the King City fault.

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REVIEW OF BIOSTRATIGRAPHY OF LOS ANGELES BASIN

The Los Angeles basin contains a thick sedimentary sequence, mainly of late Miocene and Pliocene age. Sedimentary rocks from Cretaceous through Oligocene age crop out in places along the fringe of the basin, but these strata have not been encountered in the central portion of the basin.

A rich foraminiferal assemblage makes it possible to subdivide the Miocene and Pliocene into a number of stages and zones.

Luisian fauna, generally the oldest encountered within the basin, is indicated by *Valvulineria californica* and *Anomalina salinasensis*.

Strata of the overlying late Miocene, lower Mohnian stage, contain the marker fossils *Bulimina uvigerinaformis*, *Bolivina modeloensis*, and *Epistominella gyroidinaformis*.

The upper Mohnian fauna is recognized by the presence of *Cassidulinella renulinaformis* and *Bolivina hughesi*.

The upper Miocene Delmontian stage has fauna similar to the early Pliocene Repettian stage, but contains the marker *Rotalia garveyensis* and abundant Radiolaria.

The Pliocene is divided into three stages, these being —from oldest to youngest—Repettian, Venturian, and Wheelerian.

The Repettian stage is divided into 18 zones. Typical Repettian forms are: *Ellipsonodosaria verneuili*, *Karreriella milleri*, *Bulimina rostrata*, and *Nonion pompilioides*.

The Venturian stage has the markers *Bulimina subacuminata* and *Bolivina sinuata*.

Fauna of the Wheelerian stage includes *Uvigerina peregrina*, *Epistominella pacifica* and *Bolivina interjuncta*.

The early Pleistocene guide fossils include *Cassidulina limbata* and *C. tortuosa*.

The late Pleistocene fauna has the forms *Elphidium poeyanum* and *Elphidiella hannai*.

Water depth during Luisian time was about ±1,500 feet. Water depth increased at a fairly steady rate, through the Miocene and early Pliocene, until a maximum depth of about ±5,000 feet was reached during mid-Repettian time. The water depth then slowly decreased through late Repettian and sharply decreased during the Venturian. Wheelerian water depths commenced at ±2,000 feet and ended at ±1,000 feet. The basin was filled by the close of Pleistocene time.

The main production in the basin is from strata of Repettian age. This is followed by production from the late Miocene. Rocks of other ages produce relatively minor amounts of oil.

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GEOLOGICAL VALUE OF DIGITAL PROCESSING IN HIGHLY EXPLORED AREAS

Effective and economic use of seismic methods in highly explored areas requires a different approach to the exploration problem than that used in less developed areas. In highly explored areas the subsurface structure and stratigraphy generally are well known and the exploration objective is the extension of known areas, search for new productive zones, or establishment of deeper production. Thus the seismic method must be capable of much greater resolution and accuracy, and ambiguities caused by multiple reflections and other signal-like events must be eliminated.

The Digital Seismic Exploration System, consisting of digitally recording and processing of seismic data to achieve specific objectives, is uniquely applicable in highly explored areas. Effective utilization of the system requires a step-by-step approach to the exploration problem: (1) the exploration objective must be defined in seismic terms; (2) the ability of digital technology to solve the problem must be evaluated; (3) the exploration system, consisting of special digital data collection techniques and sophisticated data-reduction processes by digital computers, must be designed; and (4) close coordination of geologist and geophysicist is required to evaluate continuously the achievement of the exploration objective and to make necessary modifications in the system to achieve the objective in a better way.

The application of these principles to the solution of a