nection was across the San Andreas fault zone at the southwestern edge of the valley and that the primary marine current was counterclockwise around the southern end of the basin.

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NEW COMPUTER-ORIENTED TECHNIQUE FOR INTERPRETING EM ANOMALIES

A geophysicist may improve his interpretation of EM (electromagnetic field) data by following four steps. (1) Noise and near-surface contributions are identified and subtracted from data by a high-speed digital computer. (2) A three-dimensional sketch of an ore deposit is interpreted by the geophysicist from characteristic data variations. (3) The data are then compared with fields previously calculated by a computer for model conductors. (4) The closest model is modified to fit the sketch and is further modified by a computer to duplicate the data most closely, thereby giving a detailed three-dimensional picture of the ore deposit.

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TV FILTER DECON BEFORE AND AFTER STACK AND EFFECT OF NOISE ON DECON

With the advent of digital processing, many new tools have been made available to the geophysicist. One of the most publicized of these is the deconvolution process, which is available in many proprietory forms, but which is designed essentially to remove repetitive events from the input signal and produce a "whitened" spectrum. The ability of the process to carry out its desired function may be hampered seriously by the presence of additive noise. It may also be affected by the sequence in which the deconvolution is carried out (*i.e.*, before or after stacking).

The writer examines the effect of additive noise on the deconvolution process, the effect of the order in which the process is carried out, and the visual signal enhancement by filtering after the deconvolution.

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MIDDLE MIOCENE SEDIMENTARY BRECCIA IN MALIBU BOWL THRUST SHEET, CENTRAL SANTA MONICA MOUNTAINS, CALIFORNIA

A sedimentary breccia included in the middle Miocene strata of the upper plate of the Malibu Bowl detachment fault provides important evidence concerning the source area of the plate. The breccia contains large clasts derived from identifiable older strata, particularly the Vaqueros Formation (lower Miocene) and the Sespe Formation (upper Eocene to lower Miocene). This breccia was first described in 1958 by R. C. Newton in an unpublished M.A. thesis at the University of California, Los Angeles; he mapped its distribution and recognized its probable landslide origin.

The breccia overlies marine shale of middle Miocene age and is overlain by submarine fragmental basalt or andesite, also of middle Miocene age. There is no evidence of subaerial erosion at the contacts. The breccia was deposited continuously across an area of 1.5 to 2 sq mi; it is locally as thick as 350 ft. In addition to the clasts of Sespe and Vaqueros sandstone, the breccia contains clasts of volcanic rock and shale that probably were derived from earlier middle Miocene deposits. The clasts generally are not mixed; those of Sespe predominate in one area, Vaqueros in another, and volcanics in yet another. The matrix in some places is coarse sand (apparently reworked from Sespe and Vaqueros sandstone), but in many areas altered basalt(?) predominates. The local volcanic matrix indicates that some volcanism was contemporaneous with the formation of the breccia.

The breccia very probably represents a landslide or series of landslides that originated on a steep slope, slid into an adjacent marine basin, came to rest on middle Miocene sediments, and was buried by later middle Miocene volcanic and sedimentary deposits. Although the Sespe and Vaqueros Formations now are exposed in the central Santa Monica Mountains, they probably were covered by early middle Miocene sedimentary and volcanic strata at the time the breccia was deposited. The nearest area where the Sespe and Vaqueros Formations are known to have been exposed at the approximate time of breccia deposition is about 10 mi north in the Simi Hills, suggesting the direction and general order of magnitude of the displacement on the Malibu Bowl fault.

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SEDIMENTATION RATES ON CONTINENTAL TERRACE OFF COLUMBIA RIVER

Rates of sedimentation were calculated for the floor of Astoria Canyon and the adjacent continental slope based on layers datable by C^{14}, the occurrence of volcanic glass from the Mount Mazama eruption (approximately 6,600 yr B.P.), and an increase in the ratio of radiolarians to planktonic foraminifers (approximately 12,000 yr B.P.).

Deposition rates calculated from the first occurrence of Mazama ash to the modern surface are highest (78 cm/1,000 yr) on the floor near the head of the canyon (water depth 100 fm), and lower (53 cm/1,000 yr) in two piston cores nearer the canyon mouth (water depths 1,000 and 700 fm). In the 700-fm core the ash is present at a depth of 350 cm. A C^{14} age of 5,620 $\pm$ 145 yr B.P. for sediment at a depth of 205 cm in the same core shows a change in deposition rate from 145 cm/1,000 yr in the lower 145 cm to 37 cm/1,000 yr in the upper 205 cm—a change probably caused by the great influx of Mazama ash.

Slower deposition occurred on the adjacent continental slope. Rates based on the faunal change range from 36 cm/1,000 yr on the upper slope to $<$ 10 cm/1,000 yr at the base of the slope. Rates calculated using all three dating methods on a single core from the lower slope are (1) C^{14}, 12 cm/1,000 yr; (2) radiolarian-foraminifer change, 15 cm/1,000 yr; and (3) Mazama ash, 19 cm/1,000 yr. The uniformity of the lithology also indicates a slower rate of deposition on the slope than on the canyon floor.

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VELOCITY INVESTIGATIONS USING DYNAMIC CORRELATIONS

(No abstract submitted)

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RADIOLARIANS AND PALEOCEANOGRAPHIC INTERPRETATIONS

Recent studies on living polycystine radiolarians show that certain members of this group are either endemic or, at least, dominant to specific water masses. Other polycystine species, with wider distributions than the aforementioned species, illustrate subspecific morphologic changes that can be correlated with specific geographical regions. Entire faunal assemblages show distinct patterns, many of which may be correlated with such oceanographic features as convergences, divergences, current systems, eddies, pycnoclines, and depths.

Because polycystine radiolarians with both long and short geologic ranges are abundant in the fossil record, this study provides a promising new avenue for making paleoceanographic interpretations.

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PALEOCURRENT PATTERNS IN UPPER CRETACEOUS BEDS OF MARSH CREEK FORMATION OF NORTHERN DIABLO RANGE, CALIFORNIA

Cretaceous turbidite beds that crop out along the northeastern flank of the Diablo Range between Altamont Pass and Mount Diablo exhibit numerous paleocurrent features.

More than 400 pieces of paleocurrent data from sole marks, sand grain and conglomerate clast fabrics, carbonaceous fragment orientation, and parting lineations collected from outcrops within a 300-sq-mi area were used to deduce that the trend of the ancient currents which deposited these beds was from northwest to southeast.

The majority of the beds studied dip homoclinally northeast into the San Joaquin Valley. Therefore, the paleocurrent analysis was dominantly two dimensional for each time-stratigraphic interval in the section.

The sequence studied is more than 20,000 ft thick and ranges in age from Maastrichtian to Turonian, but a few localities may be as old as Aptian. Dating of the beds was based mainly on microfossils, but a few ammonites and other diagnostic Upper Cretaceous megafossils also were found.

A change in thickness of the sequence from about 10,000 ft to more than 20,000 ft takes place along the strike of the beds from near Mount Diablo in the northwest corner of the area studied to Altamont Pass in the southeastern part of the area.

Current trends observed near the base of the section show little deviation from those noted higher up and, therefore, the pattern of current flow must have remained static in this area for the duration of Late Cretaceous time.

Deviations from the general paleocurrent pattern were observed in some of the paleocurrent features studied, but the number of these deviations is minor compared with the majority of the data collected.

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REGIONAL GEOLOGIC MAPPING ALONG SAN ANDREAS FAULT AND VICINITY, CALIFORNIA, BY U.S. GEOLOGICAL SURVEY

Since 1965 the U.S. Geological Survey has been systematically mapping the geology of a strip about 40 mi wide and 500 mi long along the San Andreas fault. The geology is being compiled and mapped on seven 80-mi-long segments, one after the other, on a topographic base prepared at a scale of 1:125,000 (1 in. = 2 mi). This involves field checking of available geology and mapping areas inadequately mapped or unmapped.

Geologic mapping has been completed for the first segment, which extends from Cholame to Elkhorn Hills, and includes the Pyramid Hills, Reef Ridge, Orchard Peak, Temblor, Caliente, La Panza and Sierra Madre Ranges, Carrizo Plain, and Cuyama Valley.

Regional mapping of this segment resulted in slight revision of the stratigraphy. The Pliocene marine section along the west border of the San Joaquin Valley is mapped as the Etchegoin Formation and is divided into three members where divisible. In the Sierra Madre and La Panza Ranges, the enormously thick marine clastic section of Late Cretaceous(?) age is now believed to be of Paleocene and Eocene ages. East of the San Andreas fault the thick Cretaceous marine section above the Franciscan Formation is divided into three formations.

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GEOPHYSICAL INSTRUMENTATION FOR MARINE RECONNAISSANCE SURVEYS

(No abstract submitted)

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LIVERMORE OIL FIELD, CALIFORNIA

(No abstract submitted)

FLETCHER, GERALD, Atlantic Richfield Co., Denver, Colo.

STRATIGRAPHIC EVIDENCE OF POST-EARLY LATE MIOCENE RIGHT-LATERAL DISPLACEMENT ALONG CENTRAL PART OF SAN ANDREAS FAULT ZONE, CALIFORNIA

(No abstract submitted)

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STRATIGRAPHY AND CORRELATION OF TYPICAL BLAKELEY AND BLAKELEY HARBOR FORMATIONS OF WASHINGTON

During the past 50 years the original formational term "Blakeley" has been employed to denote lithologic, stratigraphic, biostratigraphic, and chronologic