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Sedimentology of Terrace Deposits at Bend Area of Wabash River

Late Pleistocene terrace deposits lining the valley walls of the Wabash River record the change in fluvial regime imposed on the river by the advance and disintegration of the Trafalgar (East White Sublobe) ice sheet.

In the lower part of the terraces, sediments accumulated in a shallow braided stream environment where fluctuating flow was controlled by storms and by diurnal and seasonal melt cycles. The sediments consist of: (1) horizontally bedded cobble gravels deposited as longitudinal bars and channel lags; (2) planar cross-bedded pebble gravels that accumulated as transverse bars and lateral accretionary wedges on bar margins; (3) trough cross-bedded pebbly sands deposited in channels during low flow stages; and (4) thin ripple-bedded sands and silts, and laminated muds deposited by spillover into abandoned channels and irregularities on bar surfaces.

Short-term flow variations are recorded by thin alternating bar and channel sediments, which were deposited during waning flow, when channels were cut and filled on surfaces of bars formed during flood stage. Longer term variations are recorded by thicker sequences consisting of thin bar and channel deposits formed during high but fluctuating flow, alternating with thick channel deposits that accumulated during prolonged periods of low flow. These braided stream sediments were deposited during ice advance and intitial stages of ice disintegration.

The other type of deposit occurs in the upper part of the terrances and consists of large-scale trough cross-bedded cobble gravels. These sediments accumulated after the drainage network from the disintegrating ice field was fully developed and uniform rapid flow was established.

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Comparison of Middle Eocene Sporomorph Assemblages from Southern California and Gulf Coast

Fifteen samples from the Delmar Formation and Ardath Shale (lower middle Eocene) and six from the Mission Valley Formation (middle or upper part of the middle Eocene) of San Diego contain about 180 sporomorph (pollen and spore) taxa. The high diversities of Pinaceae-Podocarpaceae, *Ephedra-Ephedripites,* Palmae, Onagraceae, Bombacaceae-Sterculiaceae-Tiliaceae, and perhaps Euphorbiaceae are similar to those of the modern flora of the region. The flora apparently represents a warmer climate than does the coeval flora of the Gulf Coast. The Eocene flora of San Diego only moderately resembles the present flora of southern California and northwestern Mexico—for example, Fagaceae (oaks, etc) are very rare or absent; this suggests a different climate from that of the present (probably more moist and perhaps summer-wet rather than summer-dry).

In contrast, the middle and upper Eocene assemblages of the Gulf Coast are rich in Fagaceae pollen; these assemblages suggest that the Eocene climate was somewhat warmer but otherwise rather like the present climate of this region.

Relatively few sporomorph taxa are common to the middle Eocene of southern California and the Gulf Coast. Sporomorph correlations between the two regions are also difficult at present because the ranges of the San Diego taxa are unknown above or below the middle Eocene in southern California. Nevertheless, *Milfordia hungarica* and *Yeguapollis* may prove to be useful for correlating the middle Eocene from southern California with the palynologically better known Gulf Coast units.

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Miocene calcarenites of Menorca exhibit abundant terrigenous dolomite, both as medium-grained polycrystalline rock fragments and as fine-grained individual abraded crystals. Petrographically, this detritus looks both like neighboring Jurassic dolostones and like Triassic Muschelkalk dolostones of the same general area. To determine which stratigraphic unit(s) provided this terrigenous dolomite we characterized the iron contents of Jurassic and Triassic dolostones, using the electron microprobe, and then, with the probe, we matched the composition of the Miocene detritus with its source. As was expected from their present greater surface exposure, Jurassic dolostones proved to be the principal source. The trace of Triassic dolomite detritus in Miocene samples analyzed is proportionate to the small area of Triassic exposure relative to that of the Jurassic.

Dolomitization of the Miocene resulted in (1) pervasive fine to medium-crystalline dolomite and (2) overgrowths on terrigenous dolomite grains. In some samples, dolomite overgrowths occur in the absence of pervasive dolomite, indicating that seeding by terrigenous dolomite grains enhanced dolomitization. Later calcitization of Miocene dolomite favored centers of the pervasive variety of dolomite crystals and the inner margins of the dolomite overgrowths. These patterns of dedolomite indicate that the two occurrences of dolomite, the pervasive variety and the dolomite overgrowths, are behaviorly correlative, and suggest that they are temporally correlative as well.

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Computer Technique for Color Facies Mapping from Digital Sample Log Data

As a broad brush exploration tool, the regional lithofacies of a rock unit can be mapped in a traditional stratigraphic display with a computer.

Digital sample log data is retrieved for a correlated interval and summarized to yield net feet of various rock types for each well. Rock-type ratios are calculated for a grid, and points are analyzed to determine where they fall on a conventional 100% triangle. A test is made of the isopach to define the limits of the stratigraphic unit. Colors are assigned based upon the subdivision of the triangle, and are calculated and plotted accordingly. Two triangle subdivision schemes are available.

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Preliminary Middle Tertiary Paleogeographic Maps of Area Represented by Two-Degree Los Angeles Map Sheet, California

Recent work by graduates of California State University, Northridge, serves as the basis for constructing six preliminary middle-Tertiary paleogeographic maps of the area represented by the two-degree Los Angeles map sheet of California. The