

Lacustrine facies in the Pliocene Ridge Basin Group: Ridge Basin, California

MARTIN H. LINK *and* ROBERT H. OSBORNE

*Department of Geology, Los Angeles Harbor College, Wilmington, California 90744,
and Department of Geological Sciences, University of Southern California,
Los Angeles, California 90007, U.S.A.*

ABSTRACT

The Ridge Basin is a wedge-shaped trough 15 by 40 km which contains over 9000 m of lacustrine sedimentary rocks. Lacustrine sedimentation in the Pliocene Ridge Basin occurred in this elongated trough formed during active strike-slip displacement along the San Gabriel fault. The lacustrine and other terrestrial deposits reflect syntectonic deposition related to steep faults with components of slip along the eastern and northeast and strike-slip to oblique-slip components along the western margin of the Ridge Basin. Asymmetrical development of facies resulted from this differential tectonism along the margins of this basin. The Violin Breccia, which crops out along the western margin, consists of breccia, conglomerate and sandstone deposits that chiefly represent narrow talus and small alluvial fans that accumulated along the San Gabriel fault scarp. The Peace Valley 'beds' which occur in the central part of the basin, contain nearshore to offshore dark analcitic and ferroan dolomitic mudrock, organic-rich shale, and localized turbidite sandstone. This unit has a lacustrine origin as indicated by molluscs, ostracods, stromatolites, plants, and insect and vertebrate remains. The Ridge Route 'formation' crops out along the eastern margin and consists of sandstone and conglomerate which accounts for the greatest volume of sedimentary rock exposed in the Ridge Basin. It interfingers with both the Peace Valley 'beds' and Violin Breccia to the west. The sediments comprising this large alluvial fan-fluvial, marginal lacustrine and offshore turbidite complex were derived from the north and east.

The lower part of the Ridge Basin Group is transitional from underlying marine strata. Ridge Basin lake evolved from an externally-drained, relatively deep lacustrine and/or marine system with thick sequences of turbidite and slump-folded strata to an internally-drained, rather shallow, closed-lake system with thick sections of dolomitic mudrock. Lacustrine sedimentation in the Ridge Basin ended with the termination of movement along the San Gabriel fault. At that time the basin was filled with fluvial and fan conglomerate deposits assigned to the Hungry Valley Formation.

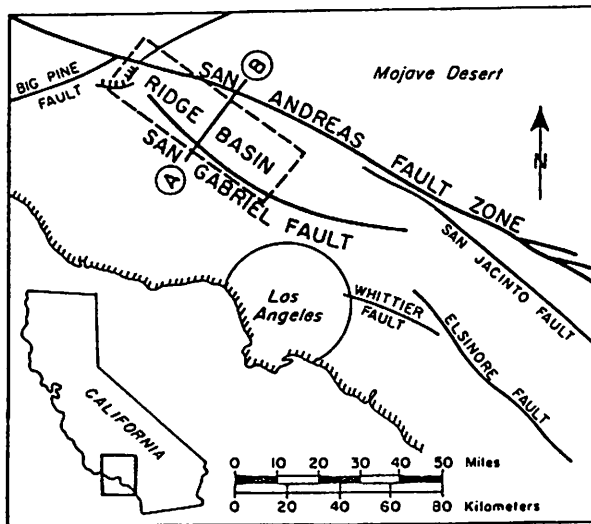


Fig. 1. Index map of the Ridge Basin, major faults, and location of diagrammatic geologic cross-section A-B.

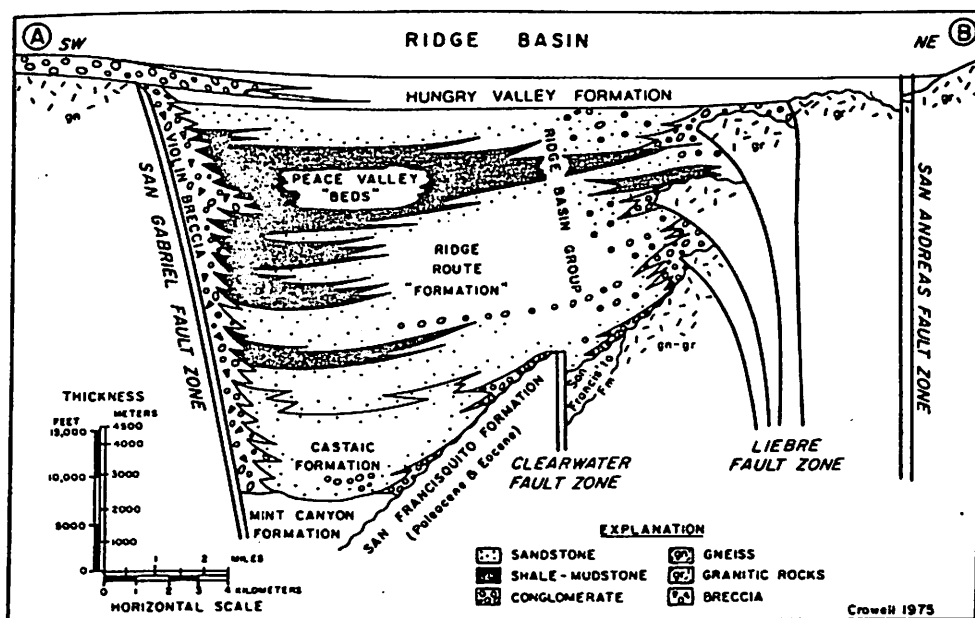


Fig. 2. Diagrammatic geologic cross-section along line A-B (Fig. 1) showing major stratigraphic and structural relationships in the Ridge Basin (after Crowell, 1975).

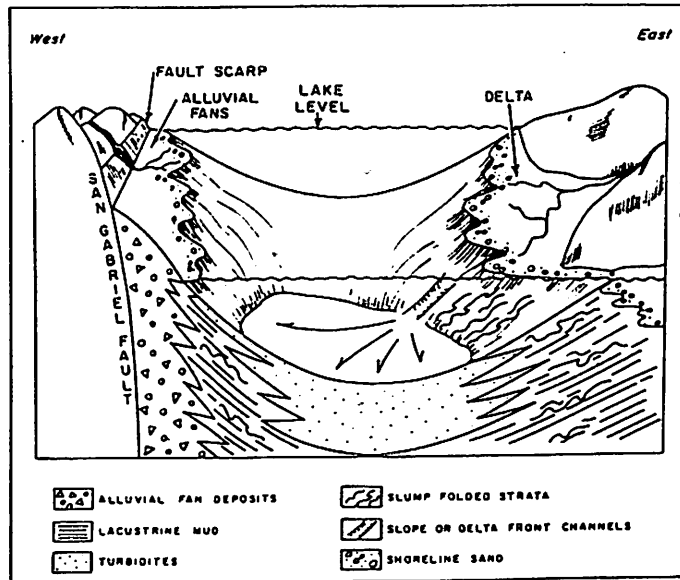


Fig. 14. Diagram depicting inferred 'deep-water' lacustrine and/or marine palaeoenvironments in the Ridge Basin, California.

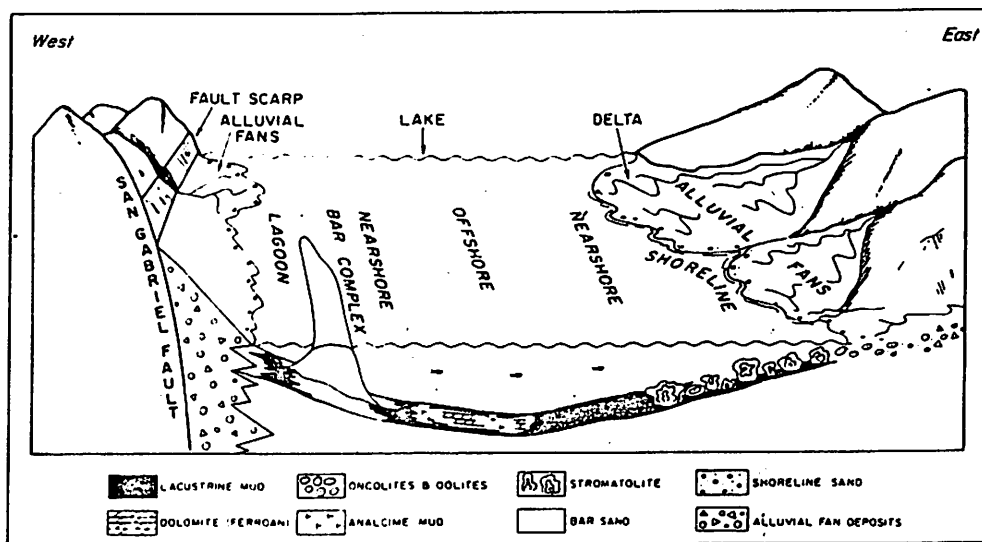


Fig. 15. Diagram depicting inferred 'shallow-water' lacustrine palaeoenvironments in the Ridge Basin, California.