Structure and Sedimentation of the Middle Tertiary Diligencia Formation, Orocopia Mountains, Southern California

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ABSTRACT

The Diligencia Formation is a lower Miocene nonmarine sedimentary and volcanic deposit located in the Orocopia Mountains in southern California. The Diligencia basin has a complex structure of folds and faults that have under gone deformation since the Farallon plate was completely subducted under the southwestern part of the North American plate during early Miocene (-12 Ma) / late Oligocene (-28 Ma) period. The region shows an elongated basin in an east – west – trending syncline/synclinorium that is unconformably overlaid by upper Pliocene and Pleistocene alluvial deposits. The basin is shortened in the north – south direction due to the dextral strike slip motion of the San Andreas fault system. It has been shown that the Vasquez Formation, Soledad Basin and the Plush Range Formation of the Tejon basin, have been transported north approximately 300 km from their original location in the Orocopia Mountains. This shows that these areas have been rotated approximately 90 degrees clockwise adjunction to the Diligencia basin which too has a rotated clockwise 90 degrees. Sequences of well and poorly sorted conglomerate breccia, sandstone, siltstone, mudstone, minor limestone, evaporitic rocks, and volcanic flows are more lithologic evidences to support the rotation in these areas. The rose diagram, contours and poles shows that the bedding planes in the region are structurally controlled by extensional deformation processes since the creation of the San Andreas fault.

*****The whole report is not for public viewing because the Diligencia basin is still an active area of research and field study taught by Professor Raymond Ingersoll, et al., at UCLA. *****