

Geochronological Constraints for Testing Controversial Paleomagnetic and Geological Models on the Tectonic Evolution of The Peninsular Ranges Province of Alta and Baja California

María Amabel Ortega Rivera*Department of Geological Sciences, Queen's University, Kingston, Ontario, K7L 3N6, Canada*(present address) UNICIT-UNAM, Instituto de Geología, Campus-Juriquilla, Querétaro, Qro., México C.P. 76230amabel@conin.unicit.unam.mx

A compilation of existing age data (Peninsular Ranges and western México), and new age determinations ($^{40}\text{Ar}/^{39}\text{Ar}$ step-heating dates) on various plutons of the Peninsular Ranges batholith, provide geochronological constraints for testing controversial paleomagnetic and geological models on the tectonic evolution of the Peninsular Ranges Province and therefore, southwestern North America. The controversy involves different perceptions of the geologic development of western México and southernmost California derived from paleomagnetic and regional geology. Whereas the geological data and plate tectonic reconstructions seem to indicate a northward motion with respect to the rest of North America since the Cretaceous, of between 300 and 500 km, paleomagnetic data suggest much greater movement involving at least 2500 km of northward translation for the Baja peninsula during the same time period. The plutons of the Peninsular Ranges batholith were emplaced from W to E between 125 and 80 Ma ago (U-Pb zircon dates) and display $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite plateau dates that range from 118 to 83 Ma and 116 to 80 Ma, respectively. Interpretation of the age data presented here supports geological arguments that the Peninsular Ranges Province has been part of the North America craton since the Early Cretaceous and has undergone only limited northward tectonic displacement, and that by simply closing the Gulf of California to its pre-Miocene opening, as indicated by the geological evidence, the Peninsula is restored to its original position.