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**LITHOSTRATIGRAPHIC, BIOSTRATIGRAPHIC, AND
MAGNETOSTRATIGRAPHIC DOCUMENTATION OF A MAJOR
UNCONFORMITY IN THE MIDDLE EOCENE TO EARLY MIOCENE
CONTINENTAL SESPE FORMATION, NORTHERN SANTA ANA
MOUNTAINS, ORANGE COUNTY, SOUTHERN CALIFORNIA**

The presence of a major unconformity in the Sespe Formation (SF) is indicated by the occurrence of closely superposed fossil land mammal assemblages (LMAs) of widely disparate ages in stratigraphic sections along State Routes 231, 241, and 261, and elsewhere in the foothills of the northwestern Santa Ana Mountains. At fossil sites situated 1 km south of the head of Gypsum Canyon; about 3 km east of the intersection of Jamboree and Santiago Roads in the city of Orange; and roughly 3 km south of the latter area, late Uintan-late Duchesnean (late middle Eocene) LMAs occur in the lower member (LM) of the SF. Early Arikareean and late Arikareean-early Hemingfordian (early Oligocene-late early Miocene) LMAs occur in the upper member (UM), stratigraphically just above the LMAs in the LM. The absence of LMAs of Chadronian-Whitneyan (late Eocene-early Oligocene) age in the intervening section in each of these three areas indicates that a major unconformity separates the LM from the UM. However, along the northeastern shoreline of Irvine Lake, the base of the UM contains an Arikareean LMA and unconformably overlies the early middle Eocene Santiago Formation, the intervening LM having been removed by erosion. Similar stratigraphic relations are observed about 10 km to the southeast near Bolero Lookout. Integration of biostratigraphic and paleomagnetic data indicate that the LM of the SF is assignable to Chron C18r (41.1-40.0 Ma), the UM, to Chrons C10n-C10r (29.5-28.3 Ma), and that the unconformity represents a hiatus of at least 10 Ma, spanning the interval from 40.0-29.5 Ma.