



Reverse palaeomagnetic polarity recorded in exposed lacustrine sediments dated 34,000-46,000 years B.P. at Searles Valley, California

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The history of pluvial Searles Lake in the Great Basin of the United States is well known from extensive field work and numerous cores recovered as part of industrial exploration of Searles Valley, in which the lake formed during the Quaternary (Smith et al., 1979; Liddicoat et al., 1980; Smith, 2009). Sediments deposited in Searles Lake (now dry) are exposed throughout Searles Valley, and siltstone and mudstone bracket about 14,000 to 46,000 calendar years B.P. (23 AMS ¹⁴C dates on gastropods and mollusks from fine- to medium-grain sand units that are interbedded with the siltstone and mudstone). The siltstone and mudstone of that age record reverse palaeomagnetic polarity following thermal demagnetization to 600 C at two localities three km apart. For three horizons of paired samples at each locality, the combined mean palaeomagnetic directions are $I = -37.5$, $D = 180.2$, $\alpha-95 = 19.5$, $n = 12$, and the mean Virtual Geomagnetic Pole (VGP) is 73.6 S, 231.8 E, $\alpha-95 = 20.6$, $n = 12$. The reverse polarity is not attributed to the Mono Lake Excursion (Denham and Cox, 1971) that never has a southerly declination or VGP in the Southern Hemisphere (Liddicoat and Coe, 1979; Liddicoat, 1992). Other samples from the two Searles Valley localities do not reach a definite reverse direction but contain a component of magnetization that approaches reverse polarity above 400 C, and higher in the sections full normal polarity is recorded. The remanence in the Searles Lake sediment that records the reverse palaeomagnetic directions is very low, and when examined in polished thin section, the siltstone contains detrital opaque grains that have a diameter of about 0.2 microns.