



Bouguer gravity anomaly map of the Socorro region

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This is one of many related papers that were included in the 1983 NMGS Fall Field Conference Guidebook.

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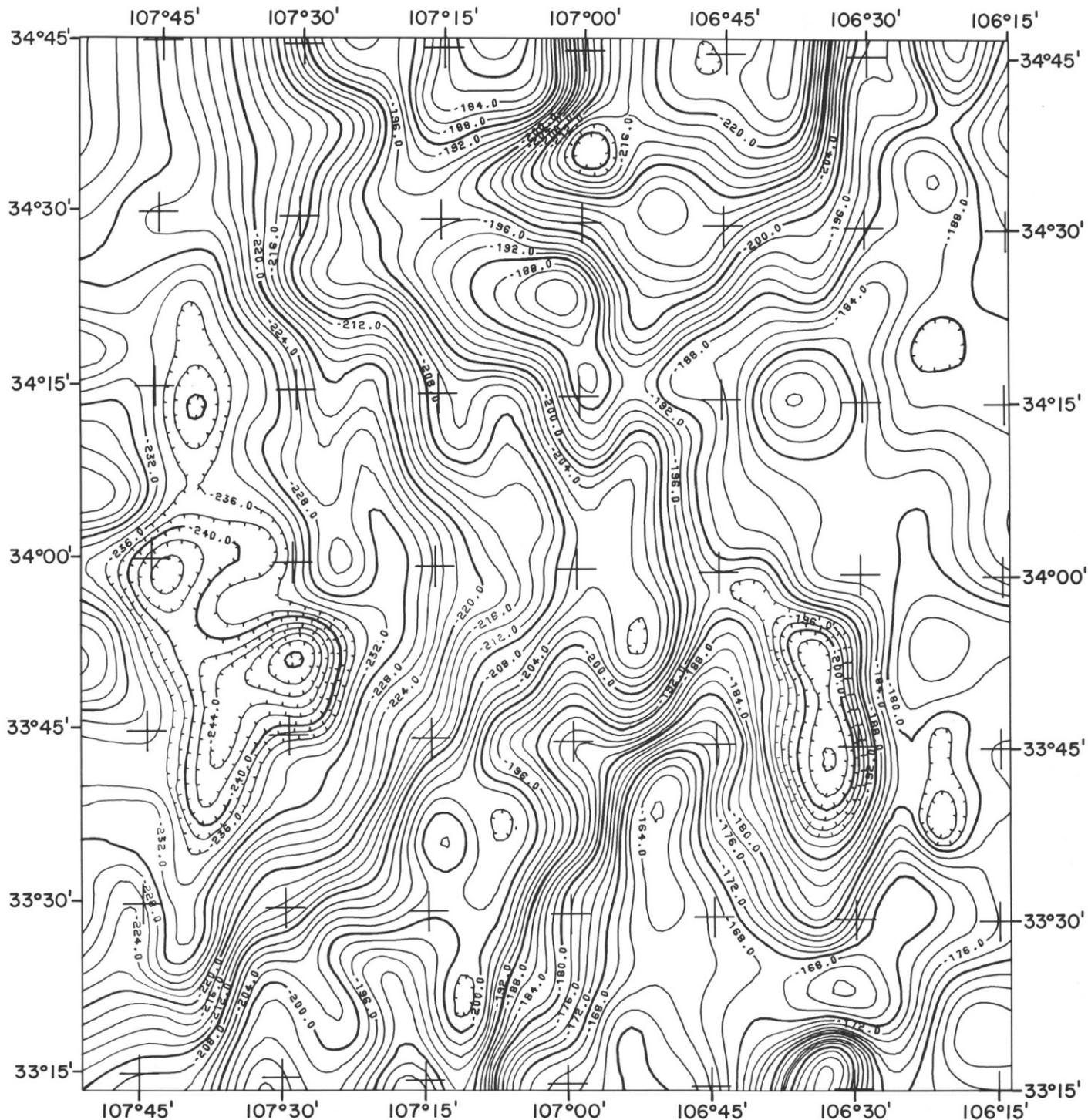
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**BOUGUER GRAVITY ANOMALY MAP OF THE
SOCORRO REGION**

G. R. Keller

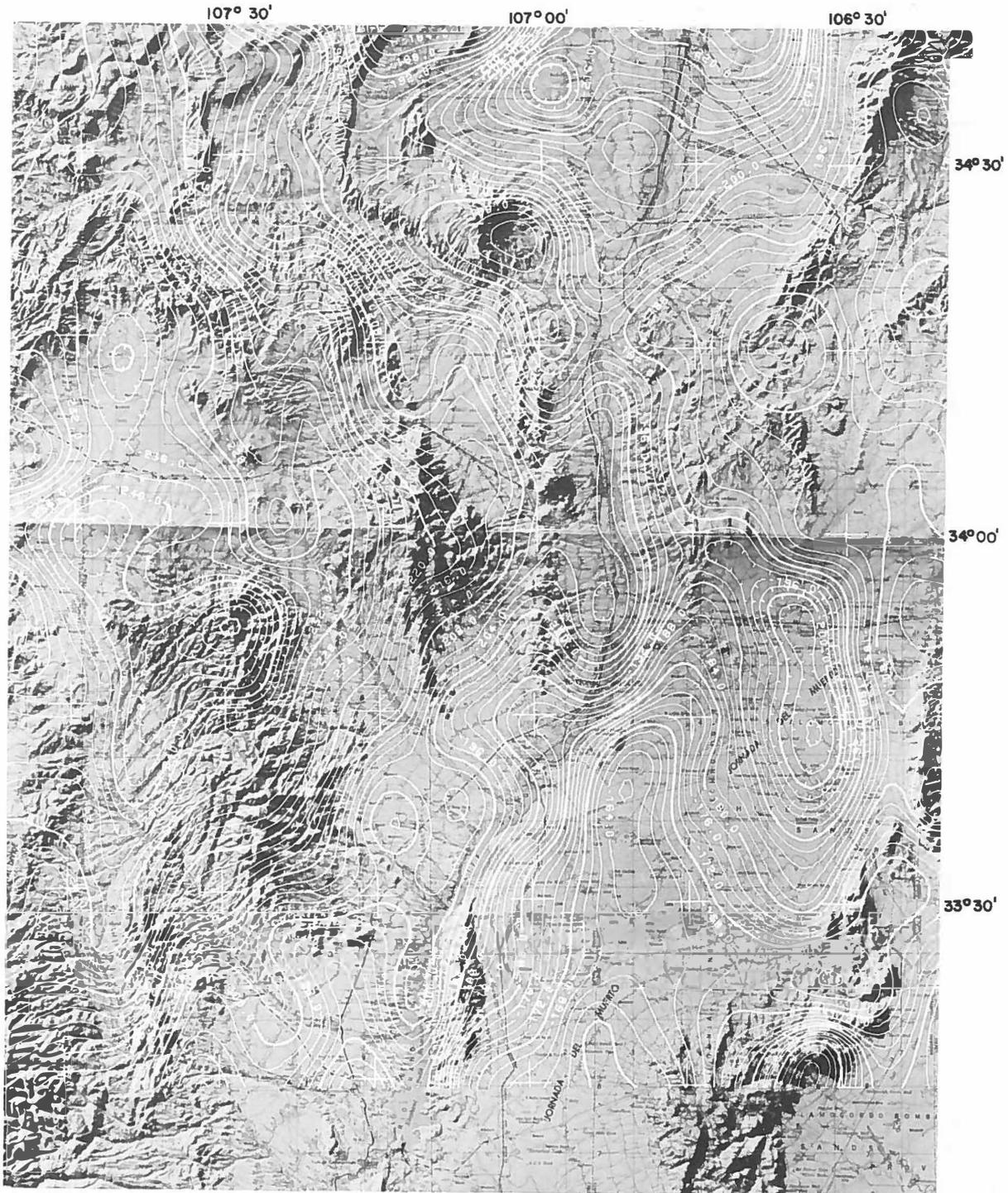
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Over the past few years, we have compiled a gravity data base for the state of New Mexico and published regional maps (Cordell and others, 1982; Keller and Cordell, 1983). This data base presently contains approximately 37,000 readings and is carefully edited and maintained in the standard format. It is also tied to a common gravity datum (IGSN-71; Morelli, 1976). The map shown was constructed using these data. Sea level was used as an elevation datum and a density of 2.67 gm/cm³ was used in the Bouguer correction. Outer-zone terrain corrections were calculated for zones extending from 0.89 km to 167 km away from each station (Hammer, 1939). These calculations employed a set of averaged elevations on a grid interval of 30" of latitude and longitude and a terrain correction program written by Plouff (1977). The computer contours were drawn

using a modified version of the Surface II graphics system (Sampson, 1978) at a contour interval of 2 milligals.

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COMPARISON OF BOUGUER GRAVITY WITH TOPOGRAPHY

The Bouguer gravity anomaly map by G. R. Keller (p. 96) is superimposed above on a topographic base made by joining parts of the Socorro and Tularosa 2-degree quadrangles (Army Map Service plastic relief maps). Note that gravity highs occur along the east sides of the Gallinas, Bear, Lemitar, and Ladron Mountains. Uranium exploration along the east flank of the Bear Mountains has

demonstrated the existence of a 3-to-5-km-wide pediment carved across gently west-tilted strata of Cretaceous, Eocene, and early Oligocene age. The gravity anomalies suggest that similar pediments may exist beneath piedmont gravels along the east flanks of the Gallinas, Lemitar, and Ladron Mountains. See entries at 49.8 and 71.2 mi in Second Day road log, this guidebook. Also note the very large gravity low of unknown origin in the northern Jornada del Muerto Basin.