

N86 - 31120¹

EXTENT AND CHARACTER OF EARLY TERTIARY PENETRATIVE DEFORMATION,
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Reconnaissance field work has led to the recognition of extensive Early Tertiary gneiss and schist which are distinguished by weakly developed to highly conspicuous northeast to east-trending stretching lineation commonly accompanied by low-dipping foliation. This structural fabric has been imposed on Precambrian to Paleogene rocks. Regionally, minimum ages of deformation are based upon interpreted U-Pb isotopic ages from suites of cogenetic zircon from the Paleogene orthogneiss. Locally, the interpreted ages indicate that ductile deformation continued as late as Oligocene (Anderson and others, 1980; Silver and Anderson, 1984). The consistency of the deformational style is such that, although considerable variation in intensity exists, the fabric can be recognized and correlated in rocks away from the Paleogene orthogneiss.

Outcrops of Tertiary gneiss and schist (Tgn-s) generally coincide with a north-northwesterly-trending belt, recognized by L.T. Silver (Silver and Anderson, 1984), within which the rock and mineral isotopic systems record a pronounced mid-Tertiary thermal disturbance. The axis of the belt, which broadens northward, extends from Mazatan, east of Hermosillo, toward Nogales on the Sonora-Arizona border. Deformed rocks do not crop out continuously within this band but occur as domains segmented by sharp or transitional boundaries. In northern Sonora extensive outcrops of Tgn-s exist between the Mojave-Sonora megashear and a series of straight, northwesterly-trending lineaments which are interpreted as normal faults, orthogonal to the stretching direction, developed in brittle sequences. Within this extensive area Tgn-s have been formed from supracrustal rocks of Jurassic(?) age intruded by the "Laramide" and younger plutons. Outside this region the volcanic and volcanoclastic rocks of the Jurassic(?) sequence are characterized by tight folds which commonly trend northwesterly to westerly. These folds are generally obliterated in areas of intense Tertiary ductile deformation. Boundaries parallel to stretching are difficult to characterize because they commonly are obscured by superposed normal faults. In northwestern Sonora, Tgn-s are not known from the region south of the Mojave-Sonora megashear. We conclude that this discontinuity influenced the existing distribution of Tertiary ductile deformation. In central Sonora, south of the megashear, lineated rocks are not widely distributed and are best developed in rocks contiguous to Paleocene plutons. In this region boundaries between lineated and unlineated rocks are transitional.

The heterogeneous crustal sequence of Sonora did not lend itself to the development of regional detachments as have been documented in Arizona and California. However, ductile normal faults are common and listric normal faults as well as detachments between crystalline rocks and structurally higher sequences are locally developed.