Fig. 2. Viking orbiter view of concentric fractures and graben west of Elysium Mons. Graben both cut and are embayed by flows of the youngest major volcanic plains unit [*Mouginis-Mark et al.*, 1984]. Frame V0541A42; width of image is 170 km.

phaestus Fossae [*Schumm*, 1974; *Hiller*, 1979], Cerberus Rupes [*Scott and Allingham*, 1976; *Scott and Carr*, 1978], and the polygonal fracture set west-southwest of Elysium Mons. The association of the linear depressions of Elysium Fossae with sinuous rilles, braided channels, and other erosional features of northwest Elysium indicates that they have at least been modified by volcanic or fluvial processes, a conclusion that also applies to the wider, flat-floored depressions. The consistent orientations of these features, however, are likely indicative of, and may have been controlled by, the direction of the regional stress field at the time of their formation [*Carr*, 1980, 1981].

A system of ridges (Figure 5), similar to lunar mare ridges [*Maxwell*, 1982; *Chicarro et al.*, 1985], is found at the eastern edge of Elysium Planitia (Figure 1), where the volcanic plains material merges with the older terrain of the Phlegra Montes [*Gifford*, 1981; *De Hon*, 1982]. The ridges are oriented approximately north-south, and the majority are located between latitudes 15°–40°N and longitudes 180°–205°W [*Gifford*, 1981; *Chicarro et al.*, 1985]. There are also several mare-type ridge segments extending approximately 600 km across southwest Elysium Planitia and trending northeast-southwest (Figure 1). In general, ridges are taken to be evidence of horizontal compression of near-surface material [*Howard and Muehlberger*, 1973; *Muehlberger*, 1974; *Lucchitta*, 1976, 1977; *Sharpton and Head*, 1982].

Also found in the Elysium region, primarily to the northwest of Elysium Mons, are a number of sinuous depressions. Some of these features strongly resemble lunar sinuous rilles [*Carr*, 1981], while others are wide and channellike, presum-