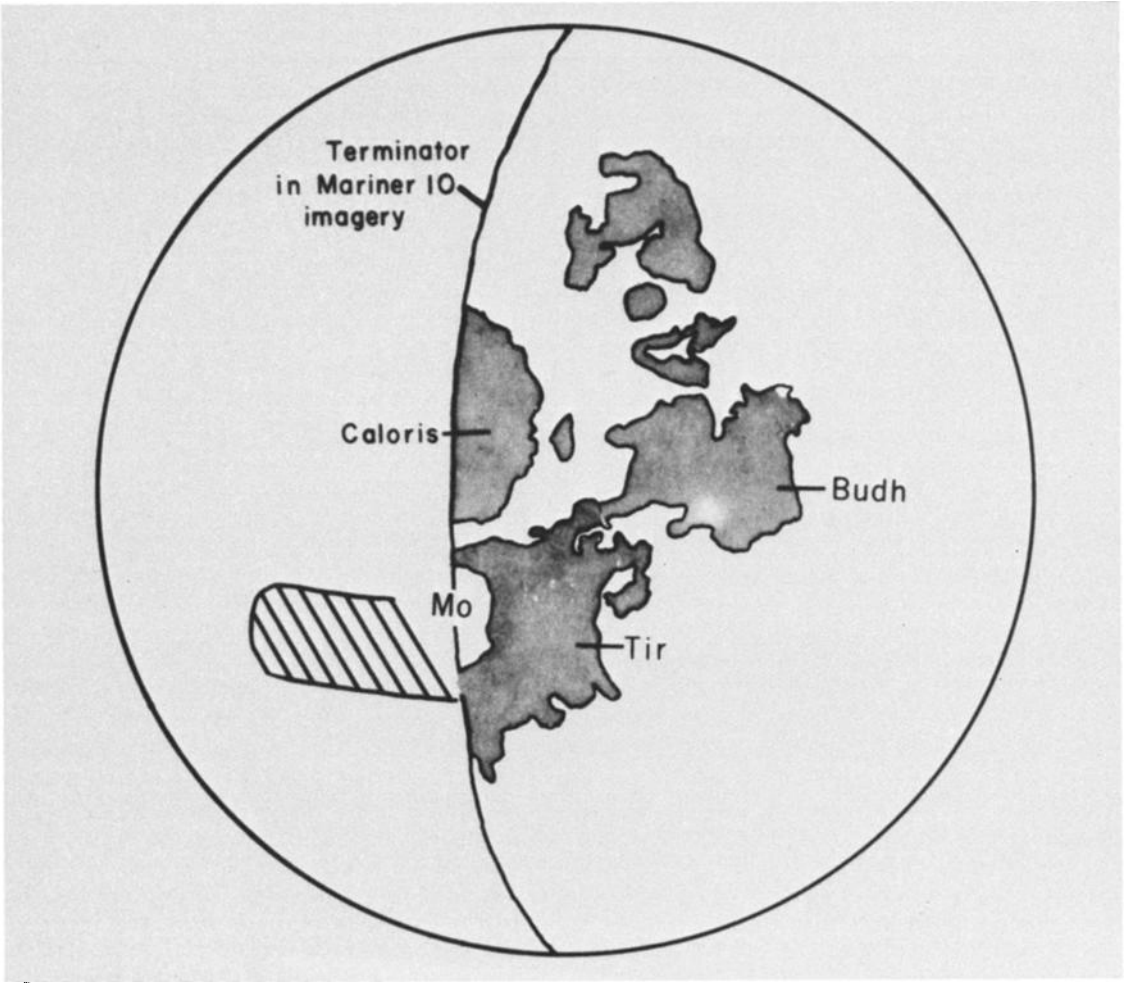

Fig. 8. Distribution of smooth plains (shaded) in and around Caloris Basin, adapted from a figure by *Trask and Guest* [1975]. The crosshatching indicates the probable extension of the smooth plains terrain into the unimaged hemisphere as indicated by the radar altimetry (see text). Also indicated are the locations of Tir Planitia, Budh Planitia, and the Mozart crater and ejecta deposits (labelled Mo).

The most plausible explanation for the distinctive down-bowed topography over Tir Planitia and the plains west of Mozart is that there has been subsidence in these areas in response to an emplaced load. The down-bowed section of profiles on Tir Planitia corresponds closely to the location of the undivided smooth plains region mapped by *Schaber and McCauley* [1980], whereas the higher, slightly rougher area to the east was mapped as intercrater plains and mixed smooth plains/Caloris ejecta terrain (see Figure 6). The distinctive concave shape of the topography and the abundance of mare-like ridges within Tir Planitia noted by *Strom et al.* [1975] and *Dzurisin* [1978] are consistent with a lithospheric loading and flexure process analogous to the emplacement and deformation of lunar maria [*Solomon and Head*, 1979, 1980].

The radar altimetry results appear to strengthen the analogy between the Mercurian smooth plains and lunar maria and, hence, to provide indirect support for a volcanic origin for the smooth plains. *Dzurisin* [1976], who supports the volcanic theory, suggested that Tir Planitia may have been filled with magma withdrawn from beneath Caloris and that this sapping process may have resulted in the subsidence and ridge formation in the Caloris Basin floor. It has been further suggested [*McKinnon*, 1979] that the subsequent subsidence of the emplaced plains outside of Caloris may have induced the final episode of uplift and graben formation in the floor of Caloris.

Although the plains region southeast of Caloris is quite smooth, some distinct topographic features can be identified in radar profiles (see Figure 6). Some of these features have been identified as ridges on the basis of comparisons of altimetry with Mariner 10 images and maps. The smallest and most numerous of these are mare-like ridges [*Strom et al.*, 1975], 100 to 200 m high and located in the low plains. Two large asymmetric ridges bound the low plains of Tir; the first rises 350 m above the mixed smooth plains/Caloris ejecta to the east and runs roughly north-south along 174°W, while the second rises about 1 km above the edge of the Mozart ejecta to the west at about 183°W. Both of these boundary ridges run approximately north-south over a distance of at least 400 km. Just to the east of the low plains, two topographic highs appear in the northernmost profile in Figures 2*c* and 6. Located at approximately 170°W and 172°W at 7.2°N, these features correspond to mapped deposits of Caloris ejecta [*Schaber and McCauley*, 1980], perhaps implying embayment of ejecta by smooth plains material.

The expanse of smooth plains west of Mozart contains topographic highs that are similar to those seen in profiles of Tir Planitia. The most prominent of these is a 1.1-km-high feature at 209°W, 9°N, which appears to extend at least as far south as 5.9°N (Figure 2*c*).

A relatively smooth section of radar profile extends from 220° to 240°W at 10°N (Figures 2*d* and 7), west of the pro-