the form of fold-perpendicular graben at the crest of Maxwell Montes suggests two things: (1) Maxwell Montes may be even younger than 200-600 m.y.; or (2) some dynamic process is inhibiting Maxwell Montes from undergoing gravitational relaxation, indicating that Maxwell Montes is active today or was active until very recently. In order to characterize better the tectonic activity and sequence of events of Maxwell Montes, we have examined the structural relationships within the mountain belt in greater detail.

STRUCTURAL MAPPING

Detailed structural mapping of Maxwell Montes using both the Arecibo and Venera imaging shows two major classes of structures: (1) the ridges and valleys which dominate the texture of the range, and (2) linear discontinuities which cut across the ridges and valleys.

Ridge and valley structure. We consider ridge/valley pairs as single structures because they are characterized in the radar images by paired bright and dark linear segments. In the Venera image, such a ridge is recognized as a radar-bright, east facing slope paired with a radar-dark, west facing slope to the immediate west. The point at which the radar-bright, east facing slope changes to a radar-dark, west facing slope is considered to be the crest of the ridge.

In the Arecibo image, we have already interpreted the radar-bright areas to be roughness associated with ridge crests. However, these radar-bright areas can be up to 10 km across, so that the specific location of a ridge crest within a radar-bright area is not immediately recognized. Examination of numerous digital number (DN or radar brightness) profiles perpendicular to prominant ridges in Maxwell Montes reveals that the most prominant ridges on Maxwell are broadly symmetrical about their peak brightness. This observation indicates that the roughness associated with prominant ridges on Maxwell Montes is symmetrically distributed about crests which exhibit peak roughness. From this we infer that the most distinctive ridges on Maxwell Montes are broadly symmetrical about the ridge crests. In Freyja Montes the ridges run parallel to the Venera radar look direction and this favorable geometry enabled *Crumpler et al.* [1986] to interpret the Freyja ridges as symmetrical anticlines. Since the ridges in Maxwell are otherwise morphologically similar to the symmetrical anticlines in Freyja Montes [*Crumpler et al.*, 1986] and based on their symmetry in DN profiles, we interpret the ridges to be symmetrical anticlines and the centers of these radar-bright areas to be the ridge crests. Since we have determined the ridge crests differently in the two data sets and because of uncertainties in coregistering the Arecibo and Venera images, we have mapped ridge crests separately for each of these data sets (Figure 3*a*).

Ridges are mapped as continuous features (Figure 3*a*) unless interrupted by one of the following: (1) Ridge termination such that the bright-dark pair identified as a single ridge is no longer discernable (this most commonly occurs as a bright ridge segment adjacent to a dark feature or area along strike); (2) an abrupt change in the width of the ridge of 50% or more (over less than 5 km); (3) an abrupt change in ridge-strike of 15° or more (over less than 5 km); or (4) any combination of these changes. Using these criteria, the mapping in Figure 3*a* shows the ridges to be extremely discontinuous along strike, with over 1000 ridge segments mapped in both the Arecibo and Venera data sets (Table 1). Individual ridge segments had a minimum length of 8 km and a maximum length of 80 km, with an average length of approximately 16 km in both data sets (Table 1).

Ford [1980] found that linear features aligned perpendicular to the radar look direction tend to be enhanced while features aligned parallel to the look direction tend to be subdued. In order to test this effect and to quantify the orientation of ridges on Maxwell Montes we have plotted rose diagrams of ridge frequency and length in 10° bins in Figure 4. The look directions of the Arecibo and Venera systems for Maxwell Montes are approximately N45°E and N85°E. Figure 4 reveals an overall agreement between the two data sets with the majority of ridges striking between N20°W and N40°W, parallelling the general strike of the mountain topography to the NNW (Figure 2). The minimal number of ridges observed parallel to both the Arecibo and Venera look directions in both data sets indicates that ridges are not being subdued there and that the ridge distributions mapped in Figure 3 are not biased

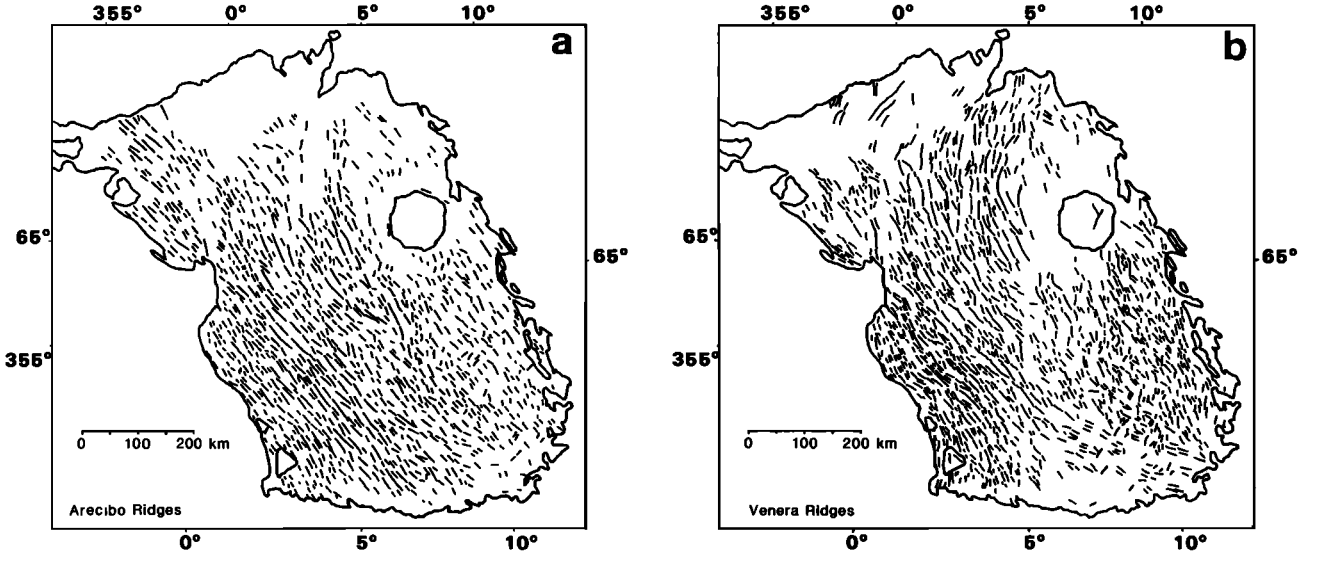

Fig. 3. Structural mapping of Maxwell Montes. The outline represents the high radar backscatter cross section boundary of Maxwell Montes. (*a*) Arecibo ridge map. (*b*) Venera ridge map. Solid lines represent interpreted crests of individual ridges.