TABLE 3. CSD Offsets (All Right-Lateral)

CSD	Offset, km
1	40
2	30
3	120
4	20
5	125
6	35
7	80
8	25
9	80

CSDs, some ridges have no corresponding ridge across the CSD at which it terminates. The simplest explanation is that these ridges were never disrupted by a CSD. Instead, they initially formed as ridges which terminated where the CSD later cut through. Therefore such a ridge would not be expected to have a corresponding ridge across a CSD. A second possibility is that a few of these ridges represent features that formed during strike-slip deformation. En echelon folds and pull-apart graben are often associated with terrestrial strike-slip environments, such as along the San Andreas fault zone [*Crowell and Ramirez*, 1979]. These features form as a result of compression or extension localized near a strike-slip fault during motion along the fault. Such features are not always continuous across the fault but may form individually on one side or the other. This fact, combined with the possibility that these features can form at any stage of strike-slip motion, means that there may be some ridges or troughs that terminate against a CSD in the reconstruction, with no continuation across the CSD.

In contrast, *Garfunkel and Ron* [1985] describe a similar type of deformation during large-scale block rotation along subparallel strike-slip faults. Their work indicates that the interior of adjacent, rotating crustal blocks may remain largely undeformed, while the boundaries of these blocks accommodate the majority of the strain and deform in order to maintain mutual contact between blocks. Similarly, we conclude that the major features used to determine the sense and amount of offset between the crustal domains of Maxwell Montes could remain largely undeformed during offset and that minor features which terminate at CSDs do not contradict the large-scale reconstruction and strike-slip offsets of up to 125 km.

Returning to the large scale, a further assessment of the model of retrodeformation can be made by examining the topography of Maxwell Montes. The present topography of Maxwell Montes is illustrated in Figure 2*c*. We have retrodeformed the present topography to a pre-strike-slip form (Figure 11*d*) as we did with the Venera image, using the offsets determined from the Arecibo image reconstruction. Since strike-slip faulting occurs for the most part in the horizontal plane, we consider it reasonable to reconstruct topography along strike-slip faults. However, we note that smaller-scale topographic features might be produced or destroyed during strike-slip motion, just as we described the possible production of en echelon folds or pull-apart graben above. With this caveat in mind, we note that this reconstruction brings the initially hummocky crest and the steep western slope of the mountain into a linear configuration and maintains the parallelism of contours on the western slope and the asymmetric profile with a steep western slope and more gentle eastern slope.

Initial configuration of proto-Maxwell Montes. The initial topographic configuration of the retrodeformed proto-Maxwell Montes (Figure 11*d*) is similar to that of the Akna Montes linear mountain belt in western Ishtar Terra (Figure 12). In particular, although the relief of Maxwell Montes is nearly twice that of Akna, both proto-Maxwell Montes and Akna Montes exhibit a general topographic pattern with an asymmetric profile and a long linear crest running parallel to the strike of the mountain (Figures 11*d* and 12*c*).

The reconstructed image mosaics (Figures 11*a* and 11*c*) depict a mountain range with a smooth pattern of long, linear ridges, similar to that of the 1000-km-long Akna Montes (Figures 12*a* and 12*b*). These long, linear ridges occur along the steep western slope and summit portions of proto-Maxwell Montes (Figures 11*a* and 11*c*), while shorter, discontinuous ridges and dissected terrain occur along the more gentle eastern slope. In Akna Montes, long, linear ridges occur along the steep eastern slope and summit portions, while shorter, discontinuous ridges and dissected terrain are found on the gentle western slope (Figures 12*a* and 12*b*). The similarity of these patterns is reflected in a comparison of the unit maps of proto-Maxwell Montes (Figure 11*e*) and Akna Montes (Figure 12*d*), as well as with Freyja Montes [*Head*, 1990]. Finally, "proto-Maxwell Montes" is 300 km in width and 1200 km in length, is slightly larger than Akna Montes (250 km by 1000 km), but has the same aspect ratio.

TECTONIC SYNTHESIS

The similarities between proto-Maxwell Montes and Akna Montes lead us to hypothesize that Akna may represent the initial, relatively simple form of compressional orogenic belts on Venus and that the deformation which produced the present Maxwell Montes occurred in at least two stages. In the first stage, proto-Maxwell Montes formed as an Akna-like linear mountain belt through compressional deformation, with the greatest principal stress oriented perpendicular to the strike of the ridges. This initial linear mountain belt had a steep western slope which may have represented the deformational front and a linear crest. This initial mountain belt had long continuous ridges on its western and central, summit regions, with less continuous ridges in the form of dissected terrain to the east. Then, sometime after the formation of the Cleopatra circular feature and its associated deposits, a reorientation of the principal axes of stress resulted in right-lateral strike-slip offsets of up to 125 km across the cross-strike discontinuities, producing the presently observed mountain range. The initiation of strike-slip faulting in the second stage of deformation need not be accompanied by a termination of first stage-type compressional deformation. During large-scale strike-slip offset, additional folding and mountain building could continue due to the original compressional forces, but they would not produce features continuous across the CSDs. Therefore the description of multiple stages in the evolution of Maxwell Montes indicates a distinction in the styles of deformation, not necessarily an unambiguous sequence involving the termination of one process followed by the initiation of another. We now proceed to describe and assess several models for the multistage deformation.

Three models for the evolution of Maxwell Montes are presented in Figure 13. The models all reflect the initiation of Maxwell Montes as an Akna Montes-like linear mountain belt followed by large-scale strike-slip faulting to generate the observed configuration. The three models differ in the processes through which strike-slip faulting is initiated and