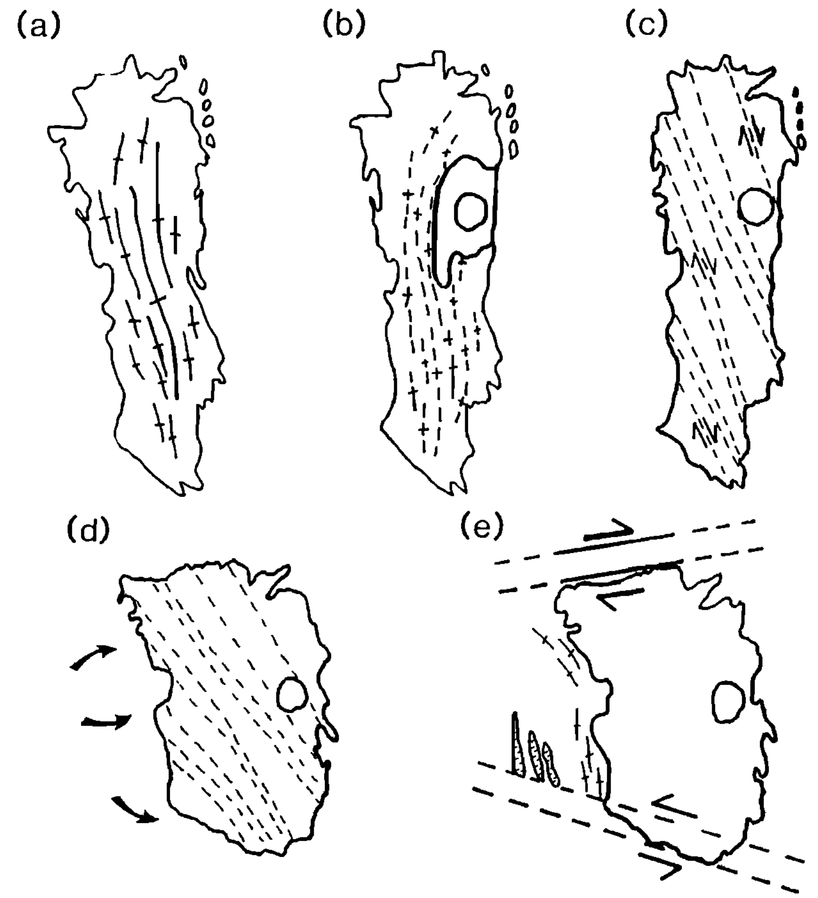

Fig. 14 Summary sketches of the sequence of events in the evolution of Maxwell Montes. (*a*) Initial formation of proto-Maxwell Montes as an Akna-like linear mountain belt. Simultaneous formation of dissected terrain. (*b*) Formation of Cleopatra Patera and emplacement of bright terrain. (*c*) Creation of, and strike-slip movement along, the cross-strike discontinuities. (*d*) Plains flooding to west and south. (*e*) Movement along shear zones and formation of extensional troughs and compressional ridges to the west of Maxwell.

without large-scale rotation of the mountain range; (2) regional N-S compression, CSD formation and offset, and large-scale counterclockwise rotation of the entire mountain belt; or (3) E-W lateral transport of proto-Maxwell Montes within two converging shear zones, resulting in NNW-SSE compression leading to CSD formation and offset. The amount of lateral transport is related to the amount of large-scale rotation of the mountain range during strike-slip offset. We favor a model involving some lateral transport accompanied by large-scale rotation.

Regardless of its specific cause, the strike-slip faulting would have produced the offset of large-scale linear and curvilinear features such as ridges, valleys, unit boundaries, and topographic contours (Figure 11). It is during this phase that Maxwell Montes underwent extensive large-scale deformation until it had attained close to its present configuration.

Late stage deformation. The final events in the evolution of Maxwell Montes include the embayment of western and southern Maxwell by volcanic flows on Lakshmi Planum (Figure 14*d*). These flow units were then disrupted to form the compressional ridges of the dark bands unit at the foot of Maxwell and the extensional troughs farther west, along with some deformation along the northern and southern shear zones (Figure 14*e*). Although one would expect large-scale gravitational relaxation of such a high mountain range, we find no obvious evidence for extensional deformation perpendicular to the strike of the mountain belt in the high central region. Instead, we note some potential N-S extension only on the northern and southern flanks in the form of short linear troughs. These troughs do not appear to accommodate great strain and may, in fact, be more closely related to strike-slip deformation associated with the north and south bounding shear zones. The lack of obvious extensional features in central Maxwell, the highest region on the planet, and the potentially minimal extension represented by the troughs on the north and south slopes suggests that Maxwell Montes may still be undergoing some NNW-SSE oriented compression, preventing large-scale gravitational relaxation from taking place. Alternatively, the compressional deformation of Maxwell Montes may have ceased recently enough that gravitational relaxation has not yet had time to produce recognizable features. If the viscosity of the lithosphere is low, then this time would be relatively short.

CONCLUSIONS

On the basis of our analysis we draw the following conclusions regarding the evolution of Maxwell Montes and the nature of tectonics on Venus: