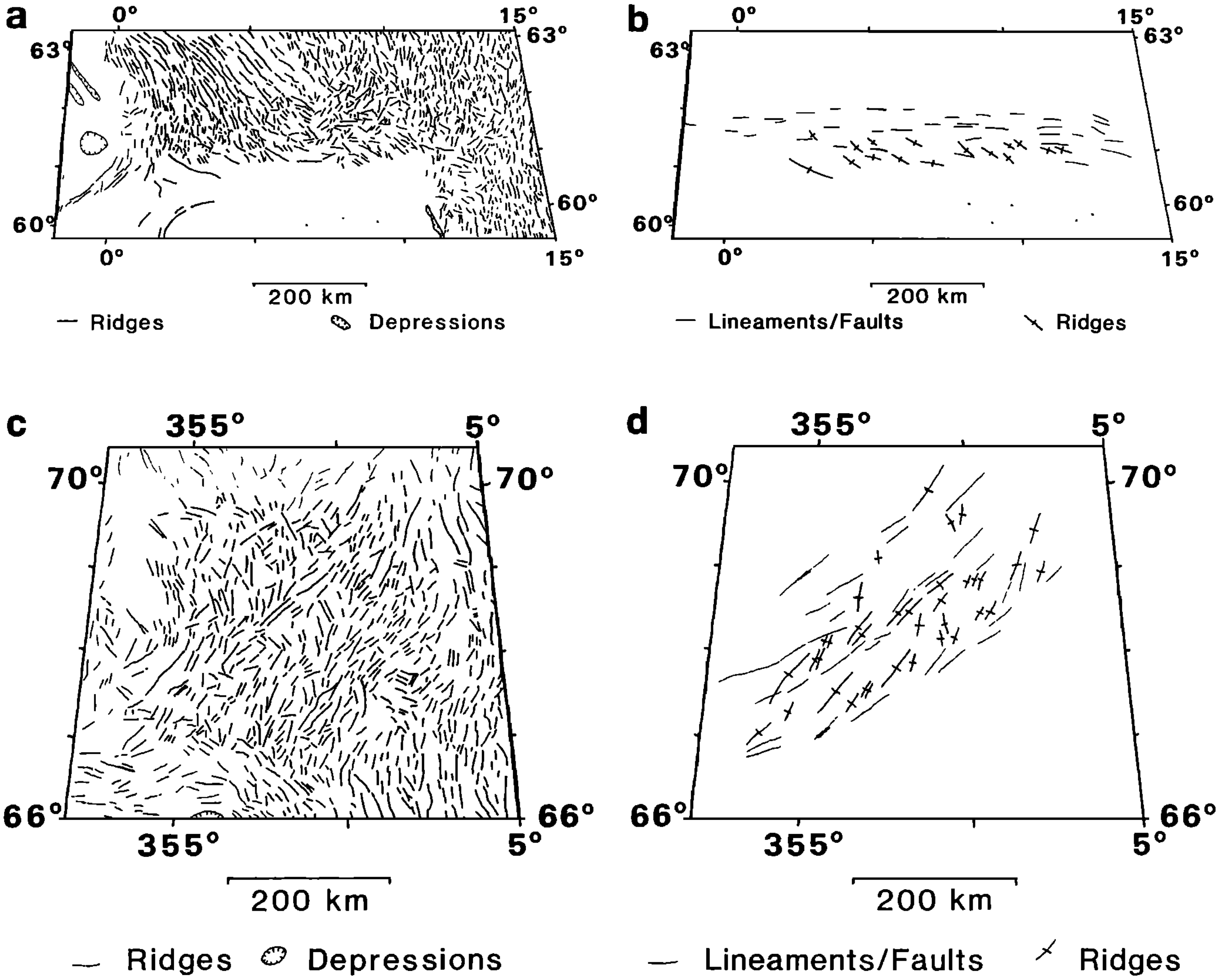

Fig. 9. Structural mapping of shear zones to the south and north of Maxwell Montes. (*a*) Structural map of southern Maxwell Montes showing all ridges (plain lines) and large, distinctive troughs (hatchured lines). (*b*) Sketch map of southern Maxwell Montes showing lineaments (plain lines) and ridges (hatched lines) used in characterizing this region as a shear zone. The lineaments are thought to represent faults, while the ridges shown are in an orientation such that they could have formed due to left-lateral shearing. (*c*) Structural map of northern Maxwell Montes showing all ridges (plain lines). (*d*) Sketch map of northern Maxwell Montes showing lineaments (plain lines) and ridges (hatched lines) used in characterizing this region as a shear zone. The ridges shown are in an orientation such that they could have formed due to right-lateral shearing.

of N60°E and large swales and individual sigmoidal ridges that strike approximately N30°E (Figure 9*d*). These ridges and swales are similar to the ridges observed in southern Maxwell (Figure 9*b*), and their orientation relative to the lineaments indicates that the shear zone has a right-lateral sense of shear. This indicates that the region south of the shear zone (i.e., Maxwell Montes) is moving west relative to the region to the north. The senses of shear along the northern and southern shear zones indicate that Maxwell Montes is moving to the west relative to the low regions flanking the mountain range to the north and south. The relative movement appears to be confined within the two shear zones because the areas north and south of Maxwell exhibit relatively little deformation in comparison to that observed on the mountain belt.

The sense of offset determined along these shear zones is consistent with the formation of Maxwell Montes through east to west crustal convergence and thickening, which we had determined earlier based solely on the topography and morphology of central Maxwell, particularly the NNE trending ridges and valleys. The movement of crustal materials from east to west and their deformation through folding, thrusting, and stacking would produce the ridges and valleys in central Maxwell, while movement along the shear zones would produce both the sigmoidal ridges and disruption in preexisting ridges observed adjacent to these zones. These observations indicate that a process of east-west compression within two converging shear zones was important in the formation of Maxwell Montes. Other processes, such as strike-slip faulting, are expected to have also played a role in the deformation of this region.

Interpretation of Maxwell Montes cross-strike discontinuities as strike-slip faults. Long, linear features are common on the surfaces of the terrestrial planets and have been attributed to a variety of origins including: planetary grids; impact basin radial structures; fracture zones analogous to those found in terrestrial ocean basins; extensional fault