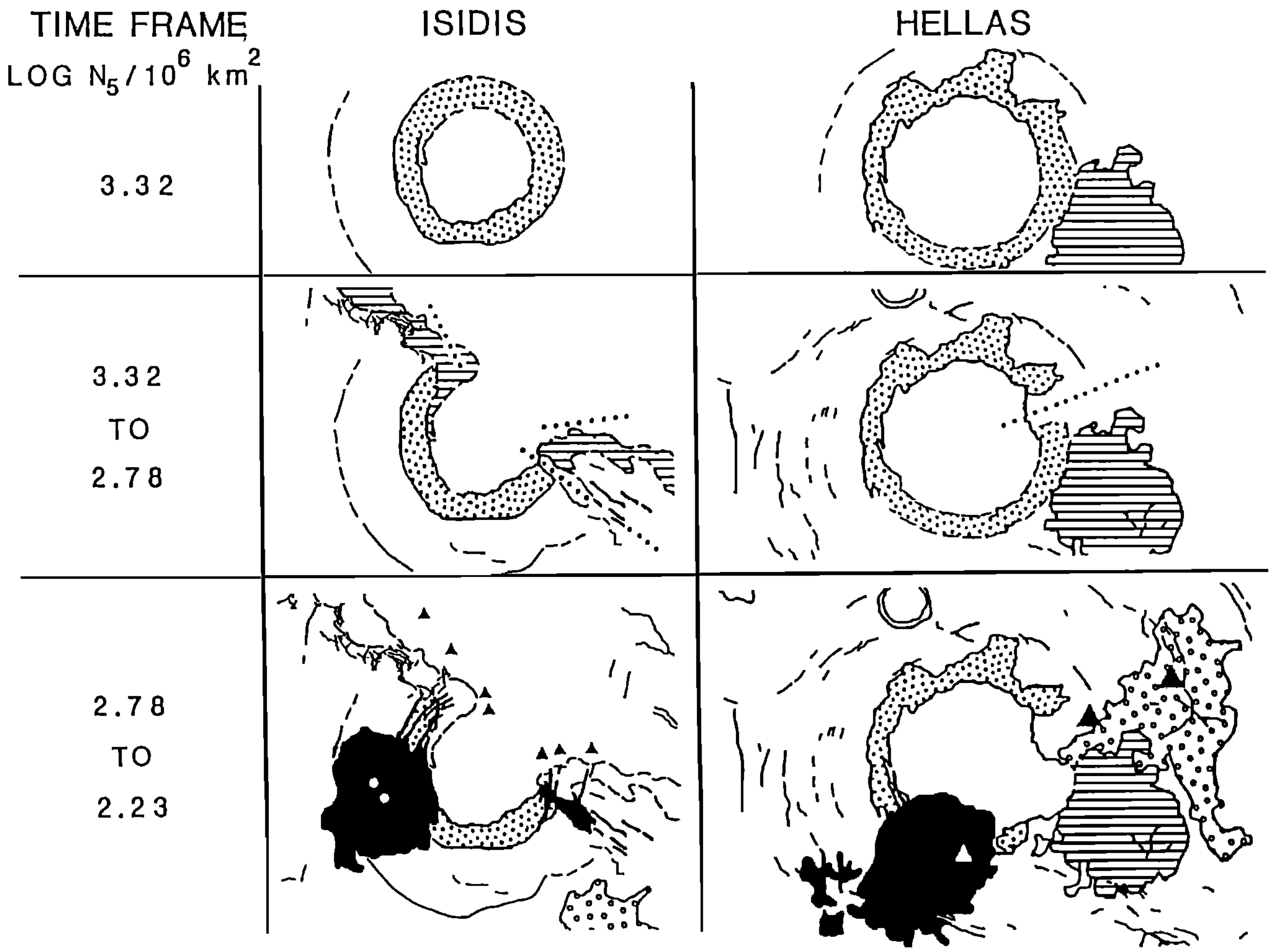

Fig. 10. A schematic representation of the observed basin evolution sequences for Isidis and Hellas. The first frame, at the time of basin formation references the basin scarp (dashed line) and massif ring (dots) regions. The region of horizontal lines is the Hellas knobby terrain which preserves a general surface age from this time. The second frame, from crater ages 3.32 to 2.78, maps the formation of distant canyons around Hellas, and radial trough formation observed in I-AT near Isidis and postulated elsewhere around Isidis and Hellas (dotted lines). The region of horizontal lines near Isidis records fretted terrain formation along the dichotomy, and the double ring feature northwest of Hellas is crater Huygens. The third frame, from crater age 2.78 to 2.23, shows graben formation in the massif rings and final volcanism in the rim plana (shaded regions), Hesperia Planum (open circles), and the highland paterae and volcanic cones (solid triangles).

plication would simply shift their determinations of lithospheric thickness to slightly larger values. For a simple cylindrical load, however, the distance between the load edge and the point of maximum stress is 1 α (Figure 11); hencie, it is a function of lithospheric thickness. An inversion now requires only an assumed load radius, rather than a detailed load model, to estimate lithospheric thickness if the outermost fracture marks the initial maximum stress point. Because complex central loads of a given radius can be approximated by several cylinders of lesser radius, a simple cylindrical load of the same radius will require a thinner lithosphere to produce a similar distribution of fracture. The assumption of both a simple cylindrical load and an initial, outermost fracture 1 α from the load edge thus introduces offsetting deviations from the formal inversion of Comer et al. Therefore a lithospheric thickness derived with these assumptions should approximate the values of a formal inversion, and all lithospheric thicknesses derived from flexural deformation in the following analysis are determined on this basis.

A second, more qualitative test of a flexure model for deformation arises from the load needed to initiate fracture for a given lithospheric thickness. As indicated in Figure 11*b*, the peak nondimensional stress arising from flexure varies with the lithospheric thickness. For a given lithospheric strength, the size of the load required to initiate fracture is thus also a function of lithospheric thickness. Since the nondimensional stress σ^* has been normalized by the applied load, this stress can be "inverted," for a calculated lithospheric thickness and assumed yield strength, into a minimum estimate of the imposed load (i.e., $\sigma^*=\sigma/q$; therefore, for $\sigma>Y$, $q>=Y/\sigma^*$). As an example, for a lithospheric thickness of 100 km, the peak value of $\sigma^*= 2.84$. If we assume that the lithospheric yield strength Y is 400