furrow formation [*Murchie and Head*, 1988]. In contrast, there is no evidence for disruption of the observed system III furrows by any shear offsets in excess of about 50 km. To restore systems I and II to their proposed original configurations, the 500 km of left-lateral shear was removed by rotating all mapped Galileo Regio structures and contacts about the pole of the small circle approximately followed by the shear fault zone (44°N,120°W). The restored configuration was analyzed in this study and is displayed in all relevant figures with the exception of Figure 1. However, had the present configuration been used instead in the following analysis, there would be no major difference in the conclusions; the 500 km of shear has only a relatively small effect on the overall geometry of furrow systems in excess of 6000 km across.

Measurement and Interpretation of Crater Densities

Crater density measurement. To aid in characterizing the relative ages and modificational histories of major dark terrain surfaces, crater densities were measured from orthographically projected, contrast-enhanced Voyager images for 10 separate areas ranging in size from 125,000 to 670,000 km^2. Among these areas are one or more representative samples of both surface units recognized in the sub-Jovian hemisphere, and five of the six units recognized in the anti-Jovian hemisphere (Figures 3*a* and 3*b*). Incremental and cumulative size-frequency distributions and cumulative densities of ≥10-km and ≥20-km craters were computed for each area. Measured crater densities and sizes, locations, and descriptions of the counted areas are given in Table 1, and incremental size-frequency distributions are illustrated in Figure 4.

Lateral differences in crater density on Ganymede's surface may represent real differences in the cratering record, or alternatively, they may result from errors in identifying and measuring craters. Possible sources of error in the measurements used in this study were discussed by *Murchie et al.* [1989*b*]. Perhaps the most important type of error is observational loss of craters, which could be caused by oblique viewing of crater-counted areas, unfavorable illumination of the counted areas (i.e., high sun angles), or counting of small craters that are only marginally resolvable in available images. Observational loss could occur at all crater diameters, but is shown by the results of *Lissauer et al.* [1988] to be most significant at small diameters. Substantial observational loss below some crater diameter should be accompanied by a consistent downturn in measured crater frequency with decreasing crater size [cf. *Hartmann et al.*, 1981]. This downturn occurs in most of the counted areas at and below the 5- to 7-km diameter increment; the downturn occurs at and below the largest diameter increment (7-10 km) in the most unfavorably illuminated counted area, northwestern Nicholson Regio (Figure 4). In none of the counted areas is there a consistent downturn within the ≥10-km diameter range, that which is used in this study for comparison of crater densities of different areas. Therefore observational loss of craters in the diameter range analyzed in this study is judged probably to be minor, and lateral differences in measured crater density are judged to be indicative of real differences in the cratering record. We emphasize, however, that lateral crater density differences due to minor observational losses in some areas cannot be entirely ruled out, and we proceed from here with this caveat.

Analysis of measurements. Interpretation of relative crater ages of different dark terrain surfaces from measurements of crater densities requires an assumption to be made about the spatial distribution of the flux of crater-forming impactors. Two types of impactor populations may have contributed to the cratering of dark terrain: heliocentric bodies in solar orbit and planetocentric bodies in orbit around Jupiter. Each of the two populations would have contributed a different spatial distribution of impactor flux. Planetocentric impactors would crater all longitudes at approximately the same rate, so relative

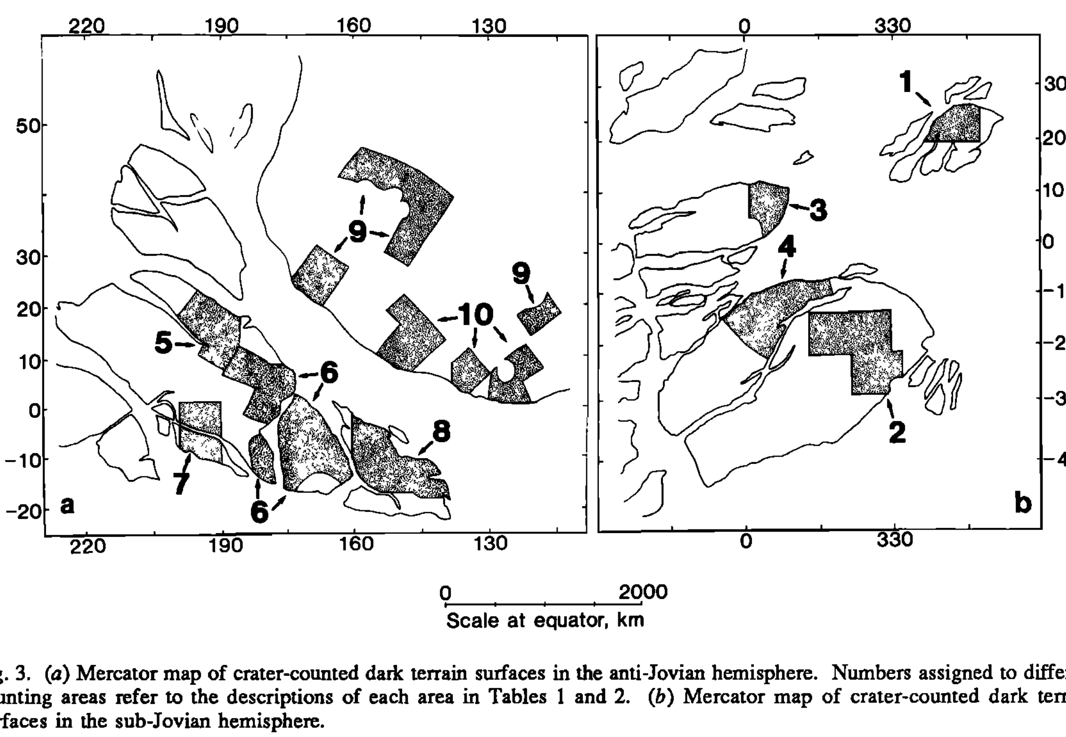

Fig. 3. (*a*) Mercator map of crater-counted dark terrain surfaces in the anti-Jovian hemisphere. Numbers assigned to different counting areas refer to the descriptions of each area in Tables 1 and 2. (*b*) Mercator map of crater-counted dark terrain surfaces in the sub-Jovian hemisphere.