has an asymmetric rim structure which is probably influenced strongly by the underlying large-scale topography. There is, however, a distinct break in slope in the radar profiles south and east of Mozart (see Figure 6) which correlates well with the edge of Mozart's continuous ejecta blanket as mapped by *Schaber and McCauley* [1980]. Here the radar profiles indicate a thickness of about 1 km for the rim/ejecta deposits at a distance of 1.2 crater radii from the rim crest.

Interior structure can be discerned for some of the larger craters and basins. For example, the craters Asvaghosa and Yeats both show hints of central peak topography (Figure 2*a*). One of the profiles across Mozart (Figures 2*c* and 6) shows some interior structure which may be indicative of an inner ring, the existence of which is also hinted at by the USGS H-8 shaded-relief map. Mozart appears to have a somewhat bowl-shaped floor (Figures 2*c* and 6, uppermost profile), in contrast to the usual assumption that larger craters and basins are flat-floored structures. The large crater in the unimaged hemisphere at 279°W, 8.5°N (Figure 2*d*), though comparable in size to Mozart, shows shallower walls broken by terrace features suggestive of an inner ring. This structure is likely to be a peak-ring basin of the same class as the basins Renoir and Rodin.

The peak-ring structure within Homer Basin (Figure 4) shows up only as rather subdued breaks in slope on the eastern side of the basin and as a 600-m-high interior peak in the topography on the western side. Homer shares its western rim with a larger, older basin to the west. This unnamed basin is centered at 44°W, 2.1°S and was included along with Mozart and Homer in a survey of large craters and basins by *Schaber et al.* [1977]. Superposition of ejecta from Homer as well as its highly degraded appearance imply that this basin is quite old. The basin is 2.2 km deep at its lowest elevation (measured from the rim crest). This is shallower than the 2.8 km depth measured for Homer, although it is likely that the apparent depth of Homer is enhanced by the fact that it lies astride a regional west-facing downslope. Unlike Homer, the basin at 44°W shows no obvious topographic or morphological ring. In addition to the superposition of ejecta from Homer, the interior of this basin has been modified by the impact that formed Titian Crater (see Figure 4) and by extensive smooth plains formation [*De Hon et al.*, 1981]. Radar profiles place the topographic rim of the unnamed basin near the narrow trough which *De Hon et al.* [1981] map as a crater chain. The topographic rise from the basin floor begins well to the east of this feature, however, and the trough itself is apparently too shallow or too narrow to yield an identifiable radar signature.

There are several cases where crater profiles are influenced or distorted by underlying topography. For example, the prominent rim of the crater Asvaghosa (Figure 2*a* and 10) is probably accentuated by the fact that it was excavated from a topographically high region formed by the combined ejecta of several large impact craters [*De Hon et al.*, 1981] and lies adjacent to two topographically lower plains regions to the east and west. Craters Handel and Yeats and Homer Basin are tilted, apparently due to a significant west-facing regional slope (see section 6), as are the craters Rudaki and Zeami (Figures 2*a* and 2*c*). In addition, the interior of the crater Yeats displays a topographic high that may be the signature of an intracrater scarp, although there may also be a contribution from the central peak.

Large Basins

The apparent dearth of large impact structures (diameter greater than 400 km) on Mercury relative to lunar abundances has been discussed by *Schaber et al.* [1977]. They suggest that this is a result of either a lower basin production rate or a higher degree of isostatic relaxation than has operated on the moon. Others have discussed the lack of identifiable multiring structures on Mercury compared to the moon or Mars and have emphasized the role that crustal characteristics may have played in the formation of very large impact structures on the terrestrial planets [*Wood and Head*, 1976; *Strom*, 1979]. More recently, *Spudis and Strobell* [1984] claim to have identified a number of degraded multiring structures based on careful photogeologic mapping of massifs and massif chains, arcuate segments of ridges and scarps, rejuvenated crater rims, and regions of anomalously high topography. Topographic information provided by radar allows us to examine and evaluate three large impact structures discussed in these works.

The one large basin identified in both the *Schaber et al.* [1977] and *Spudis and Strobell* [1984] surveys for which we have extensive radar coverage is that which is bisected by the equator in the western portion of the H-7 quadrangle. *Schaber et al.* [1977] list it as an 839-km-diameter, single-rimmed basin centered on 130°W, 1.8°N. It is the second largest Mercurian basin in their survey after Caloris. *Spudis and Strobell* [1984] identify this same basin (which they name "Mena-Theophanes") as a multiring structure centered on 129°W, 1°S, with concentric rings of diameters 260, 475, 770, and 1200 km. In Figure 5 we show four of the altitude profiles across the basin on an expanded scale (see also Figure 2*b*) along with markers indicating the approximate basin edges as given by the USGS shaded-relief map and *Schaber et al.* [1977]. The profiles show that the topography across this basin is complex and strongly latitude-dependent. The basin floor has been significantly altered by postbasin impacts; several have left craters more than 70 km in diameter. Other portions of the basin floor appear topographically smooth, possibly indicating a smooth plains fill. The southernmost profile at 4.5°S is the simplest of the four profiles in Figure 5. It shows 1.2 km of rather smooth, down-bowed relief, an upraised rim in the east, and a western rim which corresponds to a scarp visible in Mariner 10 imagery. Another profile at 2°S (Figure 2*b*; profile not shown in Figure 5) shows a rise-up from the basin floor just north of Theophanes Crater which could correspond to the outer basin ring of *Spudis and Strobell* [1984]. The most northerly profile in Figure 5 shows a very prominent basin rim in the NW along with two smooth, down-bowed sections of basin floor in the NW and NE. The two northern profiles in Figure 5 show very little topographic expression across the NE rim of the basin, whereas the eastern portion of the third profile (that nearest the equator) does show some structure which may be basin-related. The radar data show that, overall, the interior of the basin is not significantly lower than the level of the adjacent terrain. This suggests that the basin has been severely modified by postimpact processes such as isostatic relaxation, impact cratering, and volcanic filling. In addition, the interior of the basin may have experienced some localized subsidence due to the emplacement of smooth plains. Although there are some apparent correspondences between topography and the locations of concentric basin rings identified by *Spudis and Strobell* [1984], the radar data do not offer unambiguous support for the argument that this basin is a multiring structure.

Two other basins identified by *Spudis and Strobell* [1984] are also covered by altimetry profiles. The first of these is a four-ring, 1250-km-diameter structure centered on 168°W, 6°N; the second is a five-ring, 1500-km-diameter structure centered on 4°W, 10°N [*Spudis and Strobell*, 1984]. In neither case do we find any long-wavelength topographic signature in the radar data indicative of a basin. While some smaller-scale