and its identification in doubt. More importantly, it is not known whether the young were infertile or not. Furthermore, hybridization between these two forms, even if proven, does not affect the relationship of either of them to *G. polyphemus* and/or *G. flavomarginatus*; inasmuch as *G. agassizi* and *G. berlandieri* are clearly more similar morphologically than either are to *G. polyphemus* or *G. flavomarginatus*. This view, held by several previous authors, is based on several morphological characters. Thus, *G. berlandieri* is more similar to *G. agassizi* than either is to *G. polyphemus* in alveolar angle, hind foot diameter, head width and proportionate shell height (True 1882; Bogert and Oliver 1945; Williams 1950a, 1952; Carr 1957; Legler 1959; Brattstrom 1961; Legler and Webb 1961; *et al.*). *Gopherus flavomarginatus* was considered more closely related to *G. polyphemus* than to either of the two remaining species by Legler (1959) and Legler and Webb (1961) on the basis of these characters and by Auffenberg (1966a) on the basis of carpal architecture. This conclusion is supported by the studies of Rose, Drotman, and Weaver (1969) on electrophoretic composition and separation of chin gland exudates. Grant's purely speculative statement (1960) that *flavomarginatus* may be a synonym of *agassizi* lacks supporting evidence.

The lack of knowledge concerning morphological variation in tortoise species is due largely to the difficulty of obtaining sufficiently large skeletal series. This is particularly true of fossil tortoises, where previous work usually has been based on the study of single specimens or very small samples. In this study large numbers of specimens of each of the four allopatric Recent populations were accumulated for osteological comparisons: *G. polyphemus*, 63 (Florida, Georgia, Alabama, and Louisiana); *G. agassizi*, 42 (Arizona, California, Utah, and Sonora); *G. berlandieri*, 54 (Texas, Tamaulipas, Coahuila and Nuevo Leon); and *G. flavomarginatus*, 24 (Durango).

The first and most important step in an investigation of this type is the selection of characters to be used. The concepts of size and shape are fundamental to such analyses. Shape tends to provide more reliable indications of relationships among reptiles than size (Jolicoeur and Mosimann 1960; *et al.*). Careful study and comparison of the available Recent and fossil material indicate that certain structural details of the skeleton, scute proportions, and skeletal dimensions of the shell, limbs, and skull are probably the most useful and significant taxonomic characters. The exact nature of these and the method in which they were measured are identified and discussed below. These measurements are then analyzed.

Statistical treatment of linear measurements on reptiles is often complicated by the fact that objective criteria for identifying the growth