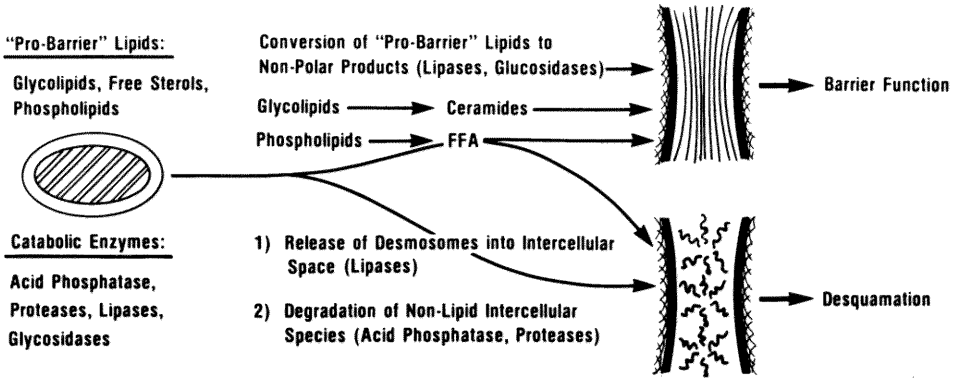

Figure 2.1 Model that summarizes available data about dynamic changes in the stratum corneum interstices that result from the secretion of lamellar body lipids and hydrolytic enzymes.

intercellular materials (26,27; Fig. 1). After outward migration into the stratum corneum, dramatic changes occur in both the morphologic appearance and histochemical reactions of the secreted material: in thin sections and in freeze-fracture replicas, large planar membranes gradually replace the short disks of the initially secreted material (5–7,20). A family of lipid catabolic enzymes, including steroid sulfatase, sphingomyelinase, phospholipase A, acid lipase, and possibly, glycosidases contribute to the ultimate degradation of residual polar lipids (glycosphingolipids, phospholipids, and cholesterol sulfate), leading to the formation of these broad membrane bilayers (18–20; see Fig. 1).

III. COMPOSITION OF STRATUM CORNEUM LIPIDS

Despite the 4-decade-old observation that stratum corneum lipids are generally nonpolar and enriched in cholesterol, the full panoply of mammalian stratum corneum lipids has only recently been unraveled. The stratum corneum is virtually devoid of phospholipids and is selectively enriched in ceramides, free sterols, and free fatty acids, with smaller quantities of glycolipids, sterol esters, triglycerides, cholesterol sulfate, and hydrocarbons present as well (28–30; Table 3). Yet, there is a gradient within the stratum corneum itself: whereas the stratum compactum still contains demonstrable levels of phospholipids, glycosphingolipids, and cholesterol sulfate, only the last persists into the stratum disjunctum (20; Fig. 2). This change