responding alcohols or the sphingosine bases." These authors also published a lipid glossary (1b) that included the names of fatty acids, lipids, and major fats and oils and terms related to their analyses; also included in their glossary are the major journals and societies that deal with lipid chemistry. Gunstone and Herslöf (1c) revised and extended the earlier edition of their lipid glossary. They added new entries, extended existing entries, and added new key references. They used more graphics to particularly depict molecular structures. The number of glossary entries increased from 900 to more than 1200, graphics from about 61 to more than 180, and the text from 100 to 237 pages. This is a very useful book on all aspects of lipid chemistry.

Christie (2) noted that a variety of diverse compounds generally soluble in organic solvents are usually classified as lipids, i.e., fatty acids and their derivatives, steroids, terpenes, carotenoids, and bile acids. He suggested that many of these diverse compounds have little in the way of structure or function to make them related and that many substances regarded as lipids, e.g., glycolipids, gangliosides, may be more soluble in water than in organic solvents. Table 1 provides a list of diverse lipophilic substances that have been examined by TLC. It includes typical sorbents and solvent systems and references for these lipophilic substances.

This chapter is concerned mainly with the more restrictive definition of lipids following Christie (46). A convenient system of classification of lipids based on this schema considers the simple lipids (compounds that upon hydrolysis yield no more than two types of primary products per mole), also referred to as neutral or apolar lipids, and polar or complex lipids (compounds that upon hydrolysis yield three or more primary products per mole). Complex lipids are the glycerophospholipids (or simply phospholipids) and the glycolipids (also termed glyceroglycolipids and glycosphingolipids), including gangliosides. Tables 2 and 3 provide lists of neutral and complex lipids along with their major chemical and physical properties and common sources of these compounds. This chapter is concerned mainly with the thin-layer chromatographic analysis of these compounds.

Gunstone and Padley (46a) edited a book on lipid technologies and applications that contains 31 chapters in six parts: Part I, Introduction; Part II, Processing; Part III, Food Emulsions; Part IV, Non-Aqueous Foods; Part V, Special Food Applications; Part VI, Nonfood Uses. Although not directly related to TLC, the book provides information on lipid structure and will be of interest to lipid chromatographers.

III. FUNCTIONS

Lipids are involved in many biological functions associated with plants, animals, and microbial organisms. The numerous functions of lipids have been studied in part with TLC and PLC methods. In the discussion that follows, significant references are given whenever possible to work that used TLC as a method of analysis.

Lipids are important as storage materials for energy reserve (47). In mammals and birds the storage depot is usually in the form of adipose tissue (48) and contains mainly triacylglycerols along with lesser amounts of free fatty acids and mixed glycerides. In sharks, skates, and rays (the elasmobranchs or cartilaginous fishes), the fat depots consist mainly of squalenes and glyceryl ethers, which are of a lower density than triacylglycerols and contribute to the buoyancy of these fishes (49). In the teleosts (bony fishes), lipids are deposited mainly in the liver, bone marrow, and muscles (50). The presence of lipids in the bone of the teleost *Helicolenus dactylopterus lahiller* (blackbelly rosefish) was studied (50a), and the lipid composition of the bone was determined by TLC with scanning densitometry; the study also used histological sections of bone to clarify the sites of lipid deposition in bone. Findings from the study suggest that lipid functions as both a hydrostatic agent and energy reserve in the blackbelly rosefish (50a). Less information is available on the storage sites of lipids in invertebrates (51). Mermithid nematodes have specialized organs called trophosomes that are used to store lipids. TLC separations of three species of mermithids showed that the trophosomes contained a similar array and distribution of lipid fractions. Triacylglycerols constituted the most abundant type of liquid, with phospholipids the next most abundant. Sterol esters and free sterols were less abundant (51a). During starvation, both vertebrates and invertebrates use lipids as an energy reserve. A TLC study (52) showed that