Any theory of the pathogenesis of atherosclerosis must fit with observed distributions of lesions within and among arterial systems and among populations of diverse economic, ethnic or social circumstance. It must also be consistent with the known effects of various factors (risk factors) on the extent of atherosclerotic lesions. Thus, a review of the topography and geographic pathology of atherosclerosis and of risk factors for atherosclerotic lesions would seem appropriate as a preliminary to discussions on the role or thrombosis in the pathogenesis of atherosclerosis.

In this report we will not attempt a detailed review of all of the earlier reports on the distribution of atherosclerosis but will refer the reader to previous reviews of this material. The basic material to be presented on the topography of atherosclerotic lesions will be taken from investigations in our laboratory, from the volume reporting the principal results of the International Atherosclerosis Project (IAP) (1), and from subsequent reports based on the IAP material. This material is limited to the aorta, coronary arteries, and arteries supplying the brain. In addition, we refer to the preliminary results of recent long-term epidemiological studies of cardiovascular disease with autopsy follow-up to summarize the latest information on the geographic pathology of atherosclerotic lesions as related to antecedent risk factors.

CLASSIFICATION OF LESIONS

Most of the material to be reviewed involves studies of arterial specimens that were stained grossly with Sudan IV. The
following working definitions are offered for different types of atherosclerotic lesions detectable grossly in such specimens. Although this classification implies a pathogenetic sequence, it can be used as a descriptive classification regardless of the ideas of pathogenetic interrelationships among the lesions.

Fatty streak. A fatty intimal lesion that is stained distinctly by Sudan IV and shows no other underlying change. Fatty streaks are flat or only slightly elevated and do not significantly narrow the lumina of blood vessels.

Fibrous plaque. A firm, elevated intimal lesion which in the fresh state is gray white, glistening, and translucent. The surface of the lesion may be sudanophilic, but usually is not. Human fibrous plaques characteristically contain fat. Often a thick fibrous connective tissue cap containing varying amounts of lipid covers a more concentrated 'core' of lipid. If a lesion also contains hemorrhage, thrombosis, ulceration, or calcification, that lesion is classified according to one of the next two categories.

This classification of lesions based on gross examination does not permit distinction between those plaques with and without a core of degenerated or necrotic lipid-rich debris. Those plaques with necrotic lesions and ulceration of the surface would of course be classified as complicated lesions. The plaques with necrotic centers and intact intimal surfaces ("atheroma" according to some classifications) would be classified as fibrous plaques. Microscopic examination is usually necessary to distinguish various subtypes of fibrous plaques.

Complicated lesion. An intimal plaque in which there is hemorrhage, ulceration, or thrombosis with or without calcium.

Calcified lesion. An intimal plaque in which insoluble mineral salts of calcium are visible or palpable without overlying hemorrhage, ulceration, or thrombosis.

The term raised atherosclerotic lesion is sometimes used to indicate the sum of fibrous plaques, complicated lesions, and calcified lesions. Raised lesions are contrasted with fatty streaks which typically show little or no elevation above the surrounding intimal surface.

Use of the word atheroma is not consistent among investigators and authors. Some use it for the lesion described above - a plaque with a pool of degenerated or necrotic lipid-rich debris. Others use atheroma to refer to the process of atherosclerosis or arteriosclerosis. Still others have used the term to refer to various