I. INTRODUCTION

Interest in the quality of irrigation water dates back a comparatively short time. In contrast, the quantity of water available for irrigation has always been of primary concern.

Hilgard (1906) was among the first to recognize the importance of irrigation water quality and proposed standards based on composition as well as on total concentration. Significant contributions have since been made by Kelley and Brown (1928), Kelley et al. (1939), Scofield (1936), Scofield and Headley (1921), Scofield and Wilcox (1931), Eaton (1935, 1936, 1950), Doneen (1949, 1954), Thorne and Thorne (1951), Wilcox (1948, 1955), and US Salinity Laboratory Staff (1954). Taylor et al. (1935) proposed an empirical equation, known as the "Salt Index," for the classification of irrigation waters. Hill (1940, 1942) and Piper (1944) in this country and Durov (1948) in the USSR developed procedures for the geochemical classification of waters. Lunin et al. (1960) investigated the use of brackish waters for supplemental irrigation in areas of relatively high rainfall. California State Water Quality Control Board (1963) presents a review of the criteria for all ordinary uses of water and a very extensive bibliography. The papers cited above are representative of the more important contributions to the subject but do not constitute a complete literature review. There are many other papers on the applied research level that are addressed primarily to water users.

Although there are differences between the several schemes for the classification of irrigation waters, there is reasonable agreement with respect to criteria and limits. This makes it possible to anticipate, with considerable confidence, the effect of a water on soils and plants. But the successful use of a water may not depend on quality alone but on other factors, including the drainage characteristics of the soil.

II. IRRIGATION WATER ANALYSIS

A. Constituents to be Determined

The total concentration and the concentration of the more important constituents must be determined to judge the quality of the water. Table 9–1 lists the determinations usually made on an irrigation water, together with the units in which they are reported.