ON THE SCALE OF THE ROCK MASS

General Statement

More than half of the contributions to this theme are concerned with the descriptive aspects of the rock mass (Table 1). This reflects in part on the success of those who have argued that the major problems in rock mechanics deal with the physical and mechanical behavior of the rock mass rather than that of the intact rock specimen alone (Denkhaus, 1965; Judd, 1964, 1965; Lang, 1964; Müller, 1964; Serafim, 1964; Talobre, 1964; and Zienkiewicz, 1965) to name a few outside the contributions to this theme. This is not to say that one can begin to solve the problems of the rock mass without some insight into the behavior of the coherent material.

What do we mean by the rock mass? In general it consists of one or more lithologic units that form a structure framework. The framework can be undeformed or a highly faulted and folded terrain (Sutić and Božinović, 1966). The detailed configuration of the mass is defined by the size and spatial distribution of the lithologic units and the orientation of the bedding, foliation, and schistosity surfaces. Macrofractures (joints, fissures, cracks, etc.) generally pervade the mass and are commonly developed in one or more sets each composed of a large number of roughly parallel individual fractures. The properties of the fractures, width, spacing, surface areas, roughness, degree of mineral filling, and the nature and magnitude of initial displacements are all highly variable. Thus the typical rock mass is a discontinuous, compositionally, and structurally complex body that is homogeneous only within relatively small domains.

It follows that the deformation of the rock mass will not be uniform and homogeneous. To date an adequate theory to deal with the required complexities does not exist. However, Steketee (1958), Chinnery (1966), and Young