The important problem of accurately and quantitatively describing macrofractures in the rock mass is dealt with by Berger (1966) and Silveira et al. (1966). Berger advocates use of sampling grids which enable him to obtain a statistically reproducible and realistic picture of the macrofracture development. Silveira and associates quantify the orientation, area, thickness, and spacing of the macrofractures, and utilize equatorial cylindrical projections as well as upper hemisphere, equal-area projections to illustrate and analyze the macrofracture orientation data.

CONCLUSIONS AND TOPICS FOR GENERAL DISCUSSION

It has been demonstrated that the intrinsic characteristics of crystals, intact rocks, and the rock mass can influence the nature of the physical and mechanical behavior of the material. Factors such as crystal structure and composition, lithology, preferred crystallographic orientation, mineral alteration, fluid saturation, grain size, and rock mass size are probably important throughout the ranges of confining pressure, temperature, and strain rate encountered in nature. On the other hand, porosity, microfractures, macrofractures, residual stresses, and most other primary and secondary anisotropies are most influential in the low confining pressure and low temperature regimes prevailing at shallow depths in the crust. It follows that all of these factors are potential variables to be considered in most engineering applications.

The accurate prediction of the deformational behavior of rocks and rock masses is a great challenge. At present we are at a disadvantage because a general theory to deal with the deformation of real materials does not exist. Moreover, it may not be possible to specify all the interrelationships between the physical environmental conditions and the intrinsic characteristics of the material. Nonetheless, it is essential in applied rock mechanics to be aware