fracturing and weathering (Boretti-Onyszkiewicz, 1966), (c) orientation of the topographic exposure relative to climatic factors and to internal structure is an important factor, and (d) the magnitude of topographic relief influences the relative importance of body forces.

Tectonic deformation of the rock mass is probably the broadest and most significant of these three topics. The important relationships between tectonics and the development of macrofractures and other surfaces of mechanical discontinuity have been cited earlier. In addition, at least three other factors are noteworthy, namely: (1) The present in-situ state of stress is the result of the superposition of residual stresses (related to some past tectonic event), current tectonic stresses, and the state of stress caused by the weight of the overburden. Judd (1964), Müller (1964), and Talobre (1964) among others have called attention to the importance of recognizing that the in-situ state of stress is apt to differ from the hydrostatic condition proposed by Heim in 1878. (2) Deformation of rocks up to a certain point produces work hardening which can in certain cases enhance the strength of the material (i.e., the Bauschinger effect). On the other hand, excessive deformation causes a decrease in supporting strength by the development of shearing surfaces as described by Norris (1966). (3) Faulting tends to influence local loading conditions. For example, Parker and Scott (1964) found in the White Pine Mine, Michigan, that pillars outside faulted areas carry more load than those in faulted areas. They attributed this to movement on fault planes which tends to relax stresses in nearby pillars and transfer loads to those in adjacent zones.

TECHNIQUES FOR MEASUREMENT AND DESCRIPTION

The number of observational techniques required in rock mechanics investigations is large because the phenomena of interest range in size over at least fourteen orders of magnitude from the crystal structure (10^{-9} m = 10 Å)