should increase with decreasing grain size in sands (as it appears to do in aggregates with interlocking texture) follows from this view expressed by Borg et al. (Ibid, p. 185) namely: "If it is supposed that all size fractions are packed in about the same manner and that there are point contacts among the grains...the pressure applied to the specimens is borne by fewer grains [in the coarser sands] so that the stress concentrations are greater, and rupture is easier."

Mineral Alteration

This topic embraces the effects on mechanical behavior produced by subaerial weathering and the circulation of ground waters. The mineralogical and textural modifications that result usually degrade the properties of the unaltered rock. For example, Iliev (1966) studied changes in certain physico-mechanical properties as a function of the degree of weathering in a suite of monzonitic rocks from the Vitosha pluton, Bulgaria. He found that the modulus of elasticity, the acoustic velocity, and the ultimate strengths were greatly reduced by weathering while porosity was increased (from 2.3 to 12.0 percent). Similar changes in the modulus of elasticity were recorded by Serafim (1964) and by Mendes, Barros, and Rodrigues (1966) whose quality index is inversely proportional to the percentage of altered minerals in the rock (Figure 9).

As for characterizing the degree of weathering, Iliev (1966) proposed a coefficient K based on the acoustic velocity in the unweathered rock (V_o) as compared to that in the weathered rock (V_w), where $K = (V_o - V_w)/V_o$. This same point is expressed in somewhat different terms by Kitsunezaki (1965). Iliev goes on to show that the acoustic velocity decreases linearly with increasing porosity. This would agree with Hamrol (1961), Serafim (1964), and Ruiz (1966) among others who regard porosity as a suitable basis for an alteration index