in ultimate strength and ductility between limestone and dolomite (Figure 7) may be illustrated by a test specimen composed of a dolomite core surrounded by calcite marble (Figure 8). The more ductile marble as deformed mainly by intragranular flow whereas the dolomite core has remained brittle and has elongated by fracture. Examples of contrasts in ductility are common in the field (e.g., see Kazanskjy and Yakshis, 1964).

Some specific examples of the role of lithology were submitted to this Congress. Dreyer (1966) correlated the volumetric content (modal analysis) of kieserite ($MgSO_4 \cdot H_2O$), anhydrite ($CaSO_4$), and polyhalite [$K_2Ca_2Mg(SO_4)_4 \cdot H_2O$] with the crushing strength for a suite of rock salt samples. He found that crushing strengths increase from 343 to 366 bars for increasing kieserite and anhydrite content (from 0 to 6 percent, each) and that the crushing strengths are independent of polyhalite content in the range 0 to 4 percent. These small differences could only have been recognized by detailed analyses with care taken to keep other variables constant. Mendes, Barros, and Rodrigues (1966) define a quality index K which for granite is directly proportional to the sum of the percentages of quartz, feldspar and micas in the rock and inversely proportional to the sum of the percentages of altered minerals, microfractures, and voids. They show that the index is related statistically to the modulus of elasticity for corresponding samples (Figure 9). Paulmann (1966) in his study of tectonically induced anisotropic behavior found that the experimental results also depended upon the type of rock as shown by his comparisons between sandstone and shale. Ruiz (1966) presents in tabular form the results of seventeen different tests of physical and mechanical properties for some twenty-six different rock types occurring in the state of São Paulo, Brazil. Examination of Ruiz's data for compressive strength versus lithology illustrates a good agreement with Handin's grouping, cited above. These detailed studies clearly illustrate the effects of lithology on the deformational behavior of rocks.