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GEOLOGY

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Author: United States Government Us Army

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The purpose of this manual is to relate the science of geology to military engineering. It is to be used for both reference and training. The manual is not intended to make geologists out of military engineers, but rather to present some of the geologic principles required for the correct solutions of many military engineering problems. It includes a survey of basic geologic materials, features, and processes. It further describes the geologic factors that affect the properties and occurrence of natural construction materials, the construction of dams, tunnels, roads, airfields, and bridges, the location of water supplies, and terrain evaluation. Geology is the science which deals with the substance, structure, and origin of the earth. It is the application of chemistry, physics, and biology\* with their related sciences, to the study of the earth. The formation and alteration of rocks are the result of chemical, physical, and biological phenomena; the behavior of gases, water, and molten and solid rock on and below the surface of the earth is principally a physical phenomenon; the occurrence of animal and plant remains in rocks is a biological phenomenon. Geology also overlaps such other sciences as astronomy, climatology, geography, hydrology, oceanography, and pedology. The relationship is especially close between pedology (soil science or soil mechanics) and geology since soil is the product of the mechanical breakdown and chemical alteration of rocks and rock particles. In military operations, the geologist can translate geologic information into concepts which can be used readily and effectively in conjunction with combat and engineering needs. Combat units, for example, benefit from geologic information in the evaluation of the trafficability of soils, the estimation of the fordability of streams, and the availability of concealment and cover. Engineering units would use geologic information in the location and use of construction materials, the location of ground-water supplies, the siting of roads and airfields, the evaluation of the suitability of foundations, the proper location of excavations, and the evaluation of possible sites for under-ground installations. Military commanders should incorporate geologic information with other pertinent data when planning military operations. Since it is impossible to predict its ultimate military value, available geologic information should be included as standing operating procedure. During operations, the actual geologic conditions encountered should be continuously observed to verify or modify the preliminary estimate. Information so obtained may have an important bearing on adjacent or future projects.

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