lithologic-summary logs compiled from detailed measured sections. These techniques have the common advantage of objective automatic generalization, so that meaningless details are minimized and important lithologic trends can be seen. Many of the systematic variations in rock content thus revealed can be traced with confidence across the outcrop and into the subsurface.

Shale comprises about 80 per cent of this 900-foot-thick body of rocks; limestone of several distinctive types makes up the remainder. Formations recognized include, in ascending order, the Lexington Limestone of recent Kentucky usage and the Kope, Dillsboro, Saluda, and Whitewater Formations. The recently defined Tanners Creek Formation can not be distinguished on a strictly lithologic basis, and it is therefore included in the Dillsboro. The Lexington and the Saluda are dominantly carbonate units; the Dillsboro and Whitewater are principally shale but include significant quantities of limestone; and the Kope is almost entirely shale. The boundaries of these formations can be rather closely identified on the several types of logs mentioned above, and refinements usually are possible where original detailed data are available. Intermediate beds and horizons also can be identified and traced for considerable distances.

In dealing with apparently disorganized rock sequences of this type, it is essential to utilize or devise techniques to elicit generalizations from the confusing maze of data.

GREEN, JACK, Research Geologist, Space and Information Systems Division, North American Aviation, Downey, California

SPACE PROGRAM APPLICATIONS OF TECHNIQUES, METHODS, AND INSTRUMENTATION UTILIZED IN PETROLEUM EXPLORATION

(No abstract submitted.)

HALBOUTY, MICHEL T., Consulting Geologist and Petroleum Engineer, Houston, Texas

GEOLOGY—FOR HUMAN NEEDS

There is no factor vital to the human race into which geology does not explore or participate in some manner, however remote, and, whether the public is aware of it or not, it is true that our science of geology is among the most important in the future welfare of the world's peoples. Based on this premise, the writer briefly reviews the history of the science of geology, cites examples of items of human needs attributable to geology, and discusses why the science of geology is being called on now, more than ever before, to meet new challenges to participate in projects to help meet the ever-growing needs of mankind.

HAM, WILLIAM E., Oklahoma Geological Survey, Norman, Oklahoma

NOMENCLATURE OF CARBONATE ROCKS

For three years the Carbonate Rock Subcommittee of the A.A.P.G. Research Committee has been compiling data for approximately 500 terms that are used in describing and naming limestone and dolomite. With the great advance in knowledge about these rocks, resulting mainly from studies associated with the occurrence of petroleum in reefs and limestone banks, the body of nomenclature is expanding constantly. Contributing to the proliferation, but not without "mixed blessings," are investigations of ancient rocks, modern sediments, environments of deposition, dolomitization, mineral species, grain-sizes, fabrics, and diagenetic processes.

The subcommittee will assemble these terms, dissect them, illustrate their important concepts, and publish the results. By means of the illustrations to accompany the final report, the subcommittee hopes to consolidate the best contemporary ideas and at the same time prevent further confusion and synonymy in this highly complex family of petroliferous rocks.

HAMILTON, E. L., U. S. Navy Electronics Laboratory, San Diego, California, and RICHARDS, ADRIAN F., University of Illinois, Urbana, Illinois

CONSOLIDATION CHARACTERISTICS OF SEA-FLOOR SEDIMENTS

Twenty-seven laboratory consolidation tests were made on predominantly silty-clay sediments from eight Atlantic cores, two Mediterranean cores, and two Pacific cores from the continental slope, rise, and deep-sea floor. Values of the coefficient of consolidation, determined over the pressure ranges of 0–0.05 and 8–16 kg./cm.^{2}, ranged from 2×10^{-4} cm.^{2}/sec. for the lower pressures to 34×10^{-4} cm.^{2}/sec. for the higher pressures. Compression indices computed from the relationship of the void ratio to the logarithm of pressure (e log p) ranged from 0.3 to 1.5.

Results of these tests show that the strength characteristics of sea-floor sediments are dependent upon the environments of deposition. Deep-water sediments generally are stronger than expected (they are "overconsolidated"). Evidence supporting this generalization, in addition to the consolidation data, is demonstrated by (1) the computed ratio of shear strength to effective overburden-pressure values (c/p) of about one to four, which are appreciably higher than the normal values of 0.2-0.4, and (2) the relatively small reduction of porosity with increasing depth below the water-sediment interface in homogenous sediment. The explanation for the observed relationship of deep-sea sediments exhibiting characteristics of overconsolidation is found in the very slow rates of deposition, great age, and the presence of appreciable amounts of clay minerals, volcanic detritus, and siliceous (Radiolaria) and calcareous (Foraminifera) biogenous matter. It is postulated that solutions of these materials in the sediments may yield iron, manganese, silica, and calcium carbonate that, together with the clay minerals, result in a kind of interparticle bonding having the effect of cementation, although actual cementation is not visible. These cementation effects are believed to be the cause of strengths greater than those expected.

HARBAUGH, JOHN W., Stanford University, Stanford, California

COMPUTER SIMULATION OF MARINE-ORGANISM COMMUNITY ENVIRONMENTS

Computers can be used to re-create the behavior of ancient marine-organism communities with surprising effectiveness. Organism communities and their environments have been represented symbolically in a three-dimensional mathematical model embodied as a series of computer programs for *IBM 7090/7094* computers. Factors affecting environmental conditions, such as depth of water, distance from shore, water turbulence, deposition of sediment, and salinity, can be adjusted by changing the numbers fed into the