Wells pentrating deep horizons in West Virginia, western Pennsylvania, and eastern Ohio encounter a limestone and chert unit at the general Onondaga level. This unit is the eastern subsurface extension of the Columbus limestone of Ohio and, probably, the analogue of the Onondaga limestone of New York. It is also the precise equivalent of the Huntersville chert. Commercial gas was discovered in it (1936) along the Chestnut Ridge anticline of southwestern Pennsylvania, and a recent Oriskany test well on the same structure encountered rock pressure of 3,275 pounds in the Huntersville. Most likely the chert is a reservoir only because of brecciation. The extreme brittleness of the Huntersville is attested on the outcrop by strong fragmentation wherever it is folded. This fact suggests its potential value as a gas and, possibly, an oil reservoir wherever deformation has caused brecciation at depth.

17. F. A. NICKELL, U. S. Bureau of Reclamation, Denver, Colorado
Geology Applied to Engineering

Engineering geology from an obscure beginning achieved most of its growth in the period of unprecedented construction chiefly during the past 15 years. The responsibility and points of interest of the engineering geologist are distinct in some respects from those in the better known fields of applied geology. However, basic considerations and methods of interpretation differ only in adaptation and emphasis. A few major projects of national importance illustrate typical problems.

18. CARL A. HEILAND, Colorado School of Mines, Golden, Colorado
Applications of Geophysics in War

War-time applications of geophysics come under the heading of military operations and location of essential minerals. In the combat zone, sound ranging helps to locate hostile guns and to adjust friendly artillery. Listening devices determine the approach of submarines or airplanes. Buried munition dumps, shells, and bombs can be located by radio detection devices. Vessels at sea may establish their position by radio-acoustic ranging. Planning of fortifications and harbors and location of construction materials will be aided by seismic refraction, electrical resistivity, and dynamic ground testing. The same methods are applicable to problems involving the construction of railroads, highways, bridges, tunnels, and munitions plants. For the last, added protection is possible by static-ground-resistance investigations. Salvage operations, location of shipwrecks and practice weapons, are aided by echo-sounding and radio methods.

In the second group, geophysics is concerned with the location of water, fuels, and strategic minerals. Water may be found under favorable conditions by electrical and seismic methods, and water wells may be tested by electrical logging. Geophysical foundation investigations are applicable in irrigation, flood-control, and power projects. Magnetic, gravimetric, seismic-reflection, and electrical well-logging methods occupy a prominent place in oil exploration. Coal and lignite deposits may be mapped by geophysical methods. Magnetic, electrical, gravimetric, and seismic exploration methods are now used in a systematic government-sponsored exploration program to uncover vitally needed deposits of bauxite, chromite, manganese, mercury, nickel, tin, and tungsten.

19. HERBERT HOOVER, JR., United Geophysical Company, Pasadena, California
Contribution of Geophysics to the National Effort

20. K. C. HEALD, Gulf Oil Corporation, Pittsburgh, Pennsylvania
Origin of Oil

21. L. L. NETTLETON, Gulf Research and Development Company, Pittsburgh, Pennsylvania
Geophysical Evidence on the Mechanics of Salt Domes

In 1934 the author presented a theory of salt-dome formation and illustrated it with a model which indicated: (1) that the motive force causing salt uplift is essentially the gravitational force resulting from the fact that the density of the salt is less than that of the surrounding sediments and (2) that both salt and sediments behave essentially as highly viscous fluids. The present paper considers the experimental and theoretical work, largely by others, carried out since that time which has a bearing on this fluid-mechanical theory.

Hubbert in 1937 derived, from dimensional considerations, the numerical relations between the physical constants of a model and its prototype in nature which should be fulfilled to give true dynamic similarity. Dobrin in 1941 determined physical constants of a fluid salt-dome model, applied Hubbert's analysis, and established that the model