R. F. CHRISTY, Shell Oil Company, Tulsa, Oklahoma. Geophysical Case History of the Elk City Field.

The Elk City field is in T. 10 N., Rs. 20, 21, 22 W., Beckham County, Oklahoma. The history of the geophysical exploration leading to the discovery is presented.

The Shell Oil Company entered the area in 1945 after seismic work had been done by several other companies. A dry hole, the deepest well in Oklahoma at that time, had been drilled on the structure in 1940. The presentation of data includes seismic records, profiles, and maps on two horizons as well as an up-to-date subsurface map.

R. V. WARD, Shell Oil Company, Oklahoma City, Oklahoma. Petrography of the Producing Sands of the Elk City Field.

Wells of the Elk City field of Washita and Beckham Counties, Oklahoma, are completed from Hoxbar "granite wash" sediments. Granite wash is a term used to designate deposits of granite conglomerate, arkose, and a conglomeration of decomposed and disintegrated acidic and basic igneous rocks. Limestone, dolomite and chert detritus are frequently included as pebbles or fragments. Grain size of the clastics varies from 0.1 mm. (silt size) to 50 mm. (pebble size). These clastics may be relatively unconsolidated or in an argillite or limestone matrix.

Facies changes occur so rapidly that reliable correlations are sparse. (To be illustrated by electric log cross sections.) The average total depth of wells in the Elk City field is 10,500 feet, which is adequate to penetrate the entire Permian, Cisco and most of the Hoxbar section. Granite wash sediments, that compose approximately 60 per cent of this interval, were derived from the Wichita Mountains to the south. Conditions under which deposition occurred were probably varied, but the presence of some marine limestones in the section suggests that some of the clastics also may be marine deposits.

Average porosity of the pay zones is approximately 18 per cent, and average permeability is 200 millidarcys. In general, there is a demarcation in permeability and porosity between the central and eastern portions of the field. The critical physical characters which control porosity and permeability are the type and amount of materials which fill the interstices. Small lime fragments, crystalline calcium carbonate, and materials of mud or silt size deposited along with granitic materials fill voids between grains and reduce interstitial space.

Lantern slides of core chips and thin sections will be used to illustrate the mineralogical composition and variations in the porosity and permeability of the Elk City pay zones.

ROBERT P. MCNEAL, Denver Sample Log Company, Oklahoma City, Oklahoma. Stratigraphy and Tectonics of Washita, Beckham, and Roger Mills Counties, Oklahoma.

The stratigraphy and tectonics of this area are closely related to the orogeny of the Wichita Mountains. A continuation of the complex faulting, folding, and overthrusts of the Wichita Mountain front occurs in lower Pennsylvanian and pre-Pennsylvanian beds in southern Washita and Beckham Counties. No pre-Pennsylvanian beds have been penetrated farther north to determine the northern extent of the disturbance.

Early Pennsylvanian beds were predominantly marine. Granite wash was deposited in limited areas during Des Moines time. It reached its peak of deposition in Missouri, Virgil, and early Wolfcamp time. The amount and areal extent of the granite wash gradually decreased during Permian time. No wash was deposited shortly after Wellington time.

The Pennsylvanian and Permian marine beds in the north finger into the predominantly continental beds toward the south with minor variations in thickness, except along the south margin of the area where some thinning occurs.

JOHN C. MAHER, U. S. Geological Survey, Tulsa, Oklahoma. Permian and Pennsylvanian Rocks of Southeastern Colorado.

Recent discoveries of oil and gas in Pennsylvanian rocks of far-western Kansas have directed attention again to the prospects in southeastern Colorado. The structural backbone of southeastern Colorado is formed by the Front Range, the Wet Mountains, and a buried ridge, the Apishapa-Sierra Grande uplift, extending southeastward from the Wet Mountains. The Las Animas arch, of later origin, plunges off this buried ridge to the northeast. Parts of three major structural basins are present in the area—the Hugoton embayment of the Anadarko basin, the Denver basin, and the Raton basin.

The Permian and Pennsylvanian rocks of western Kansas thicken westward into the Denver basin mainly by the addition of a thick wedge of lower Pennsylvanian rocks and then thin rapidly by overlap on the Front Range. Rocks of Morrow age in western Kansas can be traced across the Denver basin into the Glen Eyrie formation; rocks of Atoka, Des Moines, Missouri, and Virgil age are represented in the Fountain formation. Most of the Permian subdivisions of western Kansas lose their identity in easternmost Colorado, but the larger units can be delimited by key beds—the Stone Corral dolomite, the Blaine formation, and the Day Creek dolomite. By means of these key beds it

can be established that Permian beds of Kansas above the Cedar Hills sandstone are represented by the Lykins formation of the southern Front Range; the Cedar Hills, Salt Plain, and Harper formations are represented by the Lyons sandstone; and beds of Sumner and Wolfcamp age probably are included in the upper part of the Fountain formation. (The author's interpretation of the correlation and age designation of formations in Colorado and western Kansas is not necessarily accepted by the U. S Geological Survey.)

Maps showing the thickness and distribution of coarse clastics of the Pennsylvanian and Permian rocks suggest that the Apishapa-Sierra Grande uplift, the Wet Mountains, and the Front Range were relatively low-lying land masses at the beginning of Pennsylvanian time. The Morrow seas advanced upon the flanks of these low-lying land masses, bringing clastic material from the southeast. Near the end of Morrow time major uplifting and faulting elevated the Apishapa-Sierra Grande uplift, the Wet Mountains, and the Front Range, which supplied clastic material to transgressing seas during the remainder of Pennsylvanian time. A cross flexure marking the beginning of the Las Animas arch seems to have occurred near the end of Missouri time. During early Permian time the seas gradually covered the Apishapa-Sierra Grande land mass; during late Permian time the shore line remained fairly stable until the seas receded at the close of the period.

The possibilities for production of oil and gas from the porous limestones of both Missouri and Des Moines age in Colorado appear to be good, particularly if reef-like developments can be found fringing the more positive elements in the basins. In addition there is always present the chance of oil and gas accumulations in the basal sandstones of Des Moines, Atoka, and Morrow age and in the coarse arkosic sandstones that are overlapped along the positive elements.

STRATIGRAPHIC COMMITTEE, Panhandle Geological Society, presented by Graydon L. Meholin, chairman. North-South Stratigraphic Section Through Panhandle Region of Texas.

This talk consists of a discussion of the stratigraphy of the Oklahoma and Texas Panhandle district as revealed by a north-south cross section prepared by the Stratigraphic Committee of the Panhandle Geological Society. This cross section includes 19 wells and extends from Liberal, Kansas, to the south line of Floyd County, Texas. Both the electric and lithic logs are shown for each well.

TOMLINSON, KATHOL, and EMMERICH, Wichita, Kansas, presented by Gerald J. Kathol. Regional Setting of Pennsylvanian and Mississippian Production in Southwestern Kansas.

Exploration for oil and gas in southwestern Kansas is being accelerated. Production is being obtained chiefly from sands of lower Pennsylvanian age and from limestones of upper and middle Mississippian age.

This region is an arm or embayment of the Anadarko Basin, sometimes called the Hugoton embayment or Dodge City basin.

Slides showing the structure on the top of the Arbuckle, Mississippian, and Lansing, and one of the interval, Lansing to Arbuckle, are presented to show the regional geology of the area. Some of the more important characteristics of the producing fields are briefly discussed.

REPORT OF A.A.P.G. REPRESENTATIVE ON DIVISION OF GEOLOGY AND GEOGRAPHY OF NATIONAL RESEARCH COUNCIL FOR 1951–1952[1]

WALTER B. LANG[2]
Washington, D. C.

The Division of Geology and Geography, smallest division of the National Research Council, met on May 2 and 3, 1952, to conduct the business of the year. Out of 29 committees operating within the Division during the year, only 9 were devoted to geological research, 14 to geographical investigations and the remainder to a variety of division and administrative projects. The Division membership consists of 14 representatives from constituent societies, 4 members at large, the chairman, and one representative from the Federal Government, making 20 in all.

Those committees which have or are about to complete their work on geologic problems are—

[1] Manuscript received, June 7, 1952.

[2] United States Geological Survey.