each shot point, in order that the measured travel time to the reflecting horizon may be compared with all other shot points. The reflection seismograph method was first used in the Gulf Coast province, where the present method of correcting seismic time to a horizontal datum was developed. The special geological conditions of the Gulf Coast allow the correcting of seismic time to a horizontal datum to be usable and accurate. However, when this method of correcting seismic time is applied under other geological conditions, serious errors are introduced.

Three types of errors are inherent in correcting seismic time to a horizontal datum. These are: (1) if velocity is inaccurate, each change in elevation of the shot causes a change in the amount of error introduced; (2) constant velocity is used to correct to the horizontal datum, through different formations in each shot point; (3) formations cross the horizontal datum. When beneath the horizontal datum, these are calculated as having the average velocity to the reflecting horizon. When above the datum, the same travel time is calculated at a much lower velocity. The effect is that all near-surface structure cut by the horizontal datum is exaggerated two to three times.

Seismic time can be corrected to a geological datum if each shot hole is logged. By plotting uphole times on the log, seismic time can be corrected to a geological marker without actually placing a shot opposite the bed. By noting seismic travel time between different beds, seismic time in a whole shooting program may be corrected to a particular geological datum, by using the same methods as have been applied in surface and core-drill mapping.

Seismic time corrected to a geological datum has several advantages over time corrected to a horizontal datum. The seismograph is directly applied to local geology and seismic time is measured through the same near-surface geological section in each shot point. Variations in the seismic time between shot points are related to the deeper geological conditions and therefore more directly related to the purpose of seismic exploration.

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Pennsylvanian and Permian Regional Stratigraphy of Western Mid-Continent

Pre-Des Moines (pre- "Thirteen-Finger" limestone), Des Moines, Missouri, and Douglas sediments were deposited by a transgressive Pennsylvanian sea which originated in the Ouachita geosyncline and invaded the western Mid-Continent through the Ardmore and Anadarko basins. Successively younger Pennsylvanian beds overlapped older from the Anadarko basin onto the Central Kansas uplift, and unconformably onlapped pre-Pennsylvanian Paleozoic rocks. During this transgressive phase the Anadarko basin expanded areally as shown by the shelfward migration of (1) the hinge lines and (2) the shelf-carbonate to basin-shale facies changes. When the Anadarko basin expanded to merge with the McAlester basin on the east, blanket sandstones in the latter moved progressively westward into the Anadarko basin.

During Shawnee, Wabaunsee, Council Grove-Admire, and Chase deposition the sea began to withdraw from the western Mid-Continent and move toward the West Texas region through the Dalhart and Palo Duro basins. The Anadarko basin diminished in areal extent as hinge lines moved basinward, and became an embayment off the thicker deposits on the southwest. Shelf-carbonate to basin-shale facies changes moved progressively basinward, and blanket sandstones became successively smaller in areal extent. Permian red shales and sandstones shed by the Apishapa and Front Range uplifts were deposited in the western Mid-Continent in the wake of the retreating sea.

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Stratigraphic Oil Production in Wil Pool Area, Edwards County, Kansas

The Wil pool, located in southeastern Edwards County, Kansas, was discovered in October, 1958, and since has been extended to overlap into Stafford County. Production is from the formations at, or adjacent to, the post-Mississippian unconformity, namely, the Basal Pennsylvanian sands (Conglomerate or Cherokee?), Mississippian, and Kinderhook sand. Although a common source of supply is indicated, there are examples of a separation of reservoirs. Truncation of the various horizons plus impermeable seals are presumed to be the causes of accumulation. In most wells, fracturing is a necessity due to the low permeabilities of the formations and inactive water drives.

The pool has produced more than 158,000 barrels of oil to January, 1959, an average of more than 7,200 barrels per well in one year. Recoveries are not expected to be high, but the 40-acre spacing should make the pool profitable. The reservoir in the Wil pool has been extended to cover parts of 13 sections. Abrupt variations in permeabilities and (or) paleogeologic boundaries will possibly be the main factor in finding local areas unproductive. The total areal extent of the Wil pool has yet to be defined.

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Mississippian Production in Southwest Kansas

Southwest Kansas is situated between two regional structural features. They are the Sierra Grande uplift-Buried Amarillo Mountain trend on the southwest and the Central Kansas uplift on the northeast. Mississippian rocks are absent on both features. The Mississippian thickens to 1,800 feet between these features in what is called the Anadarko basin.

The Mississippian system consists of four series. All four produce gas and (or) oil somewhere in southwest Kansas. There are seven major Mississippian pools in the area. They range in size from 18 to 56 gas wells and 41 to 239 oil wells. There are many other commercial pools.

The Mississippian produces from both stratigraphic and structural traps. Developmental drilling has revealed 220 feet of structural relief between 40-acre locations, which is the first indication of faulting in the area. Pool studies reveal an erratic occurrence of sands in the basal Chester, a new objective.

The Mississippian is still in the pioneer stage of exploration. More major pools will be discovered.

LEWIS G. WEEKS, President, American Association of Petroleum Geologists

Energy in 2059

Population increase and an acceleration in per capita demand for energy will produce a total demand for energy in the year 2059 of 40 to 50 times that of 1959. Thus, demand for energy will a little more than double every 20 years. Much of this energy in 2059 will be