from the upper Simpson Sand, lie on a prominent northeast-southwest-trending anticline that plunges toward the southwest. This 25-mi.-long structural trend is an asymmetric fold bordered on the western flank by a normal, down-to-the-west fault possessing an average throw of 180 ft. at a Simpson datum. Discontinuous normal faulting, downthrown toward the east, exists on the more gentle eastern flank of the trend.

The Gillian pool accumulation is attributed entirely to structural closure, whereas that of the O.S.A. pool is primarily stratigraphic, because of the presence of the updip beveled edge of the upper Simpson Sand which regionally circumvents the northwestern portion of the buried pre-Mississippian Chautauqua arch. Locally in the O.S.A. sector, this sandstone edge strikes nearly north-south and parallels the crest of the anticline, thus providing a preserved sandstone section on the western flank.

The combined structural-stratigraphic relationship of these pools is significant. It is estimated that a reserve in excess of 3,500,000 barrels of recoverable oil has been proved to date.

9. C. R. KING, Consultant, Wichita, Kansas

ALAMEDA FIELD—SEDGWICK EMBAYMENT "SLEEPER"

The discovery of the Alameda field in Kingman County, Kansas, has bolstered the spirits of all seekers of Ordovician oil in Kansas. Knowing that a field of this magnitude remained undiscovered in an area where core-drill and seismic crews have come and gone during past years, its discovery has provided hope for Mid-Continent explorationists.

Most production in Alameda field comes from the Middle Ordovician Viola-Simpson. This zone produces at 36 locations. Many wells are dually completed within the Kansas City Limestone. Some wells are also completed in the Mississippian. Forty-acre spacing permits daily allowables of 44 barrels. Kansas City Limestone daily allowables average 37 barrels.

The Alameda structure is located on a northwest-southeast-striking anticlinal trend in an area of Mississippian thinning. The western side of the structure is bounded by a down-to-the-west normal fault having about 75 ft. of throw.

Alameda owes the major portion of its 35 ft. of closure in the Viola to pre-Pennsylvanian folding. Early pre-Mississippian structure was probably present at the time of folding. Some structural growth occurred during Pennsylvanian and Permian time.

The Viola-Simpson pool discovery was drilled by Stelbar Oil Corporation, with Texaco Inc. support, as a result of subsurface and seismic work.

Recovery, to date, is in excess of 1,780,000 barrels. Ultimate recovery is expected to approach 7,500,000 barrels of oil.

10. B. J. WRIGHT, Champlin Petroleum Company, Wichita, Kansas

LYONS WEST FIELD, RICE COUNTY, KANSAS

The Lyons West field was discovered in March, 1963, 34 years after the first of four "dry holes" was drilled within the present productive area. Nomenclature inconsistencies and lack of the electric logs contributed to the delay in recognizing the widespread continuity of the pre-Pennsylvanian sandstones which were called "Conglomerate," "Kinderhook," or "Misener," depending on their position in the basal Kansas City-Maquoketa section.

The limits of the field are essentially defined; it covers 5,000 acres, and has 104 wells producing from one or more of four contiguous sandstone bodies which comprise the Kinderhook bar. This bar, approximately 10 mi. long and 2 mi. wide, is composed of Simpson-derived sediments deposited in an embayment between the Chase-Silica section of the Central Kansas uplift and the Geneseo-Edwards peninsula.

The reservoir has a gas-solution and water drive with a series of successively higher gas caps and water levels from south to north formed by small noses across the bar.

This field inspired exploration which resulted in the later discovery of several smaller fields. The relationship between Lyons West and adjacent comparable production is speculative at this time.

11. C. S. BARTLETT, JR., J. M. Huber Corporation, Oklahoma City, Oklahoma

NEW APPROACHES TO ARKOMA BASIN GAS EXPLORATION

The Arkoma basin is becoming a giant among gas-producing areas. Few gaps remain in the 150-mi. chain of gas pools from near Hartshorne, Oklahoma, to Russellville, Arkansas. Rapid development since 1949 has resulted in 90 new gas fields.

Well-exposed surface structures, anticlines, and fault traps have been mapped by field geologists and by seismic crews. Drilling these structures has been a principal exploration method.

At least 35 separate units from the Upper Pennsylvanian to the Upper Ordovician have proved productive. With the hundreds of new deeper wells, it is now evident that the principal trap is stratigraphic, with structure often secondary.

Much of the gas production today is from sandstones that have previously been identified as lower Atokan. Evidence is now available to reassign these beds to the reinstated Winslow Formation of the Morrow Group. The Winslow Formation is apparently of deltaic origin, the sediments having come from a predominantly northern source. Channels, with a generally north-south orientation were established outward into the basin. These channels are evident on sandstone porosity maps of individual Winslow sandstones. Sandstone mapping is now possible in much of the Arkoma basin and will greatly aid in selecting both development and wildcat locations.

12. L. O. WARD, Ward & Gungoll, Enid, Oklahoma

MISSISSIPPIAN OSAGE, NORTHWEST OKLAHOMA PLATFORM

The Sooner trend portion of the Northwest Oklahoma platform comprises a fractured limestone belt subparalleling the Anadarko basin hinge-line from West Edmond field through Enid townsite to Ringwood field. It ranges in width from 15–30 mi. and it is approximately 90 mi. long.

Fracturing forces have been supplied by orogenies affecting the Nemaha ridge and Anadarko basin. Open fractures within the brittle cherty members of the thick Mississippian carbonate possess permeability ranging from sub-commercial to astronomically high. The reservoirs exist because of this widespread, effective permeability system. High initial potentials and fairly wide regional drainage support the common-source concept.

Fracture density often determines reservoir value. It is difficult to predict fracture density in advance of drilling. Consequently, attractive areas are defined by