part of the geosyncline are thick, probably Triassic redbeds. Superjacent strata consist of widespread evaporites, notably halite, and redbeds which may be Triassic, Jurassic, or both, in age. Younger Jurassic, Coahuilan, Comanchean, and early Gulfian rocks vary lithically from coarse, marginal, or continental clastics to basin and platform or shelf carbonates. Thick evaporites, predominantly anhydrite, are present in the Late Jurassic, Coahuilan, and Comanchean of the Gulf region. Extensive, calcareous-argillaceous, marine Cretaceous beds constitute evidence of the maximum spread of oceanic waters upon North America during the Mesozoic. Subsequently, in the Tertiary, waves of clastic sediments progressed into the geosynclinal province. Paleogene sedimentation centered in the Rio Grande region of southern coastal Texas whereas Neogene deposition was concentrated in southern Louisiana and adjacent offshore area. Tertiary thicknesses in each area exceed 25,000 feet. In the Florida and Yucatan platforms, on the other hand, deposition of carbonates predominated during the entire Mesozoic and Cenozoic.

Major sedimentary units of the geosynclinal mass are arranged in belts roughly concordant with the general trend of the modern shore. In gross form, they resemble flattened link sausages, the thick portions corresponding with centers or loci of deposition (depocenters) of particular sedimentational epochs. Several depocenters of the same age constitute a regional axis of deposition (depoaxis), the locations of which have gradually shifted gulfward since the Jurassic. Major reversals of this gulfward migration occurred in the Cretaceous and Tertiary and resulted in widespread cyclic sedimentary sequences (cyclothems).

Filling of the Gulf basin occurred by seaward building (prograding) of sedimentary masses. With progradation, depression of the continental edges continued; the sedimentary masses increased generally in thickness, possibly because of concentration in belts of less width; and tilting and uplift of the landward margins of the older rocks of the geosyncline occurred. Sags, swells, faults, salt structures, and so on, measurably deformed and affected the sedimentary materials. These processes of accretion and deformation continue today, gradually adding girth and natural resources to the continental area.

2. JOHN G. WINGER, Chase Manhattan Bank, New York, N. Y.

United States Energy Outlook to 1975

Presentation will deal with outlook for domestic petroleum industry to 1975. Outlook will demonstrate impact of U. S. economy and energy markets of a significant change in the composition of the population by age brackets. A regional division of U. S. energy market will show relative opportunities for market growth of oil and gas in each area. Pointed up will be the effect on oil of likely gas expansion in Atlantic Coast market.

3. JOHN D. HAUN and HARRY C. KENT, Department of Geology, Colorado School of Mines, Golden, Colorado

Geologic History of Rocky Mountain Region

In late Precambrian time, sedimentary rocks were deposited in a developing geosyncline in the Cordilleran region. Eastward extensions of this geosynclinal sea occupied parts of the Rocky Mountain Region. Following gentle deformation and erosion the sea spread eastward during the Cambrian and Ordovician Periods.

Discontinuous Ordovician, Silurian, and Early Devonian rocks indicate short intervals of marine invasion interrupted by periods of erosion. A major invasion of the sea over the craton is recorded by the onlap of Devonian and Mississippian carbonates and Devonian evaporites which rest on rocks ranging in age from Precambrian to Early Devonian.

The pattern of widespread shallow seas of the Mississippian Period was interrupted in the Pennsylvanian and Permian Periods by significant tectonic activity (Ancestral Rockies). Portions of the uplifts remained positive until Triassic or Jurassic Periods and supplied coarse clastics to adjacent areas within late Paleozoic basins. At greater distances from land areas, sandstones, redbeds, evaporites, and carbonates accumulated.

Marine Triassic sediments were deposited in southeastern Idaho and adjacent areas. Triassic and Early Jurassic continental deposits accumulated throughout much of the region.

A series of Jurassic marine invasions from the Arctic initiated another major sequence of events. The boreal sea moved southward into the northwestern and western parts of the region in Middle Jurassic and successive transgressions reached as far southeast as northern Colorado by Late Jurassic. After withdrawal of the Jurassic sea, the pattern of overlap was continued by deposition of nonmarine Jurassic and Cretaceous sediments.

In the Early Cretaceous a sea again invaded from the north and in late Early Cretaceous joined a southern sea forming a seaway which persisted during the remainder of the Period. During Early Cretaceous, clastic sediments were derived from the craton to the east and from the Cordilleran region to the west. In Late Cretaceous, the western source area predominated.

The present tectonic framework was initiated during the Late Cretaceous and early Tertiary with the development of uplifts and intermontane basins (Laramide Orogeny) accompanied by the emplacement of the Idaho batholith and associated intrusions. Extensive thrust faulting occurred in the western part of the region. Lacustrine and fluviatile sediments, derived from surrounding uplifts, were deposited within the intermontane basins.

Volcanic activity was moderately important to the west during the Cretaceous Period, but igneous intrusion and volcanic activity became widespread throughout the Rockies in the Tertiary.

The present drainage system was largely developed as the intermontane basins filled. Subsequent stream erosion, accompanied by Pleistocene glaciation and regional uplift, resulted in the shaping of the present topography.

4. L. DAVID GRAYSTON, Monsanto Oils Ltd., Calgary, Alberta, Canada

Paleozoic Tectonic Framework of Western Canada Basin

The Paleozoic sedimentary record in the Plains and Rocky Mountains (Eastern Cordillera) regions of western Canada is fairly complete, but it is characterized by five major unconformities and at least four lesser discontinuities. The five interregional breaks form the boundaries of four distinct depositional sequences which are, in general, equivalent to the Sauk, Tippecanoe, Kaskaskia, and Absaroka (lower part) of Sloss (1963). With minor exceptions, these sediments are all of miogeosynclinal and shallow shelf types. In the Western Cordillera west of the Rocky Mountain trench, Devonian and Mississippian rocks are almost totally lacking except in northwestern British Columbia where