field indicates that the coal-bearing strata accumulated during seven minor progradations of the shoreline of the Cretaceous seaway.

The lower and middle coal zones consist of eight and six seams, respectively, and were deposited in a swamp 20 km wide on the landward side of a barrier-island complex. The upper coal zone consists of a single seam that accumulated in interdistributary swamps in a deltaic setting.

The three coal zones were deposited during the three of the seven progradations that are completely developed. The remainder are incompletely developed and do not contain significant coal seams.

Complete vertical sequences of barrier-island and deltaic progradation are present in the Straight Cliffs Formation. Incomplete progradational sequences are usually composed of transition, shoreface, and foreshore deposits.

The repetitious nature of the several progradations and transgressions of barrier-island deposits and the local incompleteness of their development suggest periodic fluctuations in the quantity of sediment supplied by longshore transport currents from deltas northwest of the study area. Delta-lobe abandonments probably resulted in the periodic interruption of sediment supplied to the barrier-island complex and allowed sufficient time for compactional subsidence in the barrier complex to cause minor transgressions.

VERRALL, P., Chevron Co., Madrid, Spain

Geologic and Structural History of Zagros Foldbelt, Iran

The earliest discernible event in the Zagros area, which is structurally the northern part of the Arabian continental block, was the deposition of the Infracambrian Hormuz salt, presumably in a rift basin with a north-south boundary on its west side. The overlying shallow-marine miogeoclinal shale-carbonate sequence through the Cambrian is overlian by deeper water Ordovician and Silurian shales, representing a progressive foundering of the rift margin. A second rift event, oriented along the present northern margin of the Zagros foldbelt, began in the pre-Permian, represented by a significant angular unconformity at the base of the shelfal, largely carbonate, Permian to Late Cretaceous sequence.

Sharp change from carbonate to marl deposition along this margin in the latest Cretaceous suggests rapid deepening associated with arrival at a north-dipping oceanic subduction zone, which almost immediately thrust melange and ophiolites up over the edge of the shelf. This entire ensemble has been colliding with the Central Iranian Block along a second north-dipping subduction zone since the Miocene, resulting in essentially concentric folding of the Infracambrian to Miocene shelf sequence, largely upon a basal detachment within the Infracambrian Hormuz salt but also involving the basement in north-dipping thrusts and in tear faulting, and involving the salt in numerous compressionally induced diapiric structures. The syntectonic, evaporitic, Miocene-Pliocene Fars Group rocks represent deposition in a basin restricted by the actual collision event. They are involved in the Zagros folding, and also in enormous, southward directed gravity glides down the regional topographic gradient resulting from the orogeny. The huge oil and gas traps of the area are within the concentric Zagros fold structures, in strata ranging from Permian to Miocene in age.

VOSS, JAMES D., 6750 W. Loop S., Bellaire, TX

Geology of Calvin Field—Deep Basinal Jurassic Play in North Louisiana Salt Basin

Calvin field is currently being developed by Getty Oil Co. but was discovered in 1941 with a Paluxy gas sand completion by Hunt Oil Co. In 1972-73 Texaco drilled two Cotton Valley wildcats which were plugged and abandoned but had interesting Cotton Valley gas shows. In 1976, Getty Oil Co. (Skelly) 1 Bodcaw blew out in a Cotton Valley sand section. Getty Oil and Bodcaw Oil and Gas have established and extended production, completing seven additional wells. To date, the productive limits of the field have not been defined but considerable information is at hand, including that concerning the generally poor porosity and permeability of reservoir rock. Presently six wells, and an extension to the northeast, appear potentially productive in one or more of eight Lower Cretaceous and Upper Jurassic formations. Greatest potential appears to be in Upper Jurassic (Cotton Valley) sand section. These reservoir sands interfinger with gray marine shales over the structure and are absent off the southern flanks.

Calvin structure was formed before the close of Jurassic time on an uplifted carbonate shelf when salt movement created trough-like depressions to the northwest and southeast. The resulting faulted anticlinal feature experienced local erosion and subsequent infilling with coarse clastics brought down from the Ouachita foothills to the north and deposited in a localized deltaic environment. Marine transgression from the south immediately followed with the accumulation of extensive regional sand bars and beach deposits. The Upper Jurassic section may have been buried several thousands of feet deeper in Tertiary time than the present 12,500 to 13,000 ft (3,810 to 3,962 m).

WAKEFIELD, W. W., Juniper Petroleum Corp., Denver, CO

Mason Lake Field, Musselshell County, Montana

In the Mason Lake field, the discovery of oil in the 1st Cat Creek sandstone, Lower Cretaceous in age, occurred in March 1978. Further ongoing development in the area is presently defining the limits of the field.

Discovery of the oil potential from the 1st Cat Creek sandstone occurred while development drilling to the 3rd Cat Creek sandstone was in progress. This potential had gone undetected for several wells because oil shows were absent in dry samples and rarely detectable in wet samples. The high-gravity oil (47°) may partly offer some explanation as to the unusual disappearing behavior of the oil in the dry drill cuttings. In 1964, electric-log analysis and drill-stem tests of this zone in the general area offered little evidence of potential oil production.