ing the Delaware basin or an excess of mass under the Central Basin platform. The West Platform fault zone is basement controlled. The seismic activity recently recorded in the area may be related to these deep-seated basement structures. The geophysical and geologic similarities between the southern Oklahoma aulacogen and the Permian basin suggest that the latter may be related to a late Precambrian aulacogen.

KNEBUSCH, WILLIAM E., Sul Ross Univ., Alpine, TX

Evidence for Deltaic Environment of Deposition for Aguja Formation (Upper Cretaceous), Southwest Texas

The Aguja Formation consists of approximately 650 ft (200 m) of claystones, calcareous concretions, sandstones, ironstone concretions, humate-bearing shales, and seams of humate material, in an area 8 mi (13 km) northwest of Big Bend National Park, Texas.

Three informal members of the Aguja Formation are based on the varied lithology. The lower member is gradational with the underlying Pen Formation and is composed of approximately 200 ft (60 m) of yellow and light to dark-brown massively bedded claystones, lenticular beds of calcareous concretions, and thin to massive-bedded and cross-bedded channel sandstones. The lenticular beds of calcareous concretions and cross-bedded channel sandstones occur near the top of this member. Massive claystones dominate the lower member and contain a wide variety of forams, and a restricted fauna of gastropods and pelecypods. The relation of claystone to sandstone, within the lower member, reflects a coarsening-upward sequence and suggests a gradational change from a prodeltaic to a lower delta-plain environment.

The middle member of the Aguja Formation is gradational with the underlying lower member. The middle member is composed of approximately 300 ft (90 m) of lenticular, thin to massive-bedded, and cross-bedded sandstones, dark-gray massive claystones, and interbedded claystones and sandstones. Lenticular beds of ironstone and ironstone concretions, humate-bearing shales, and seams of humate material also are present in this member. The wide variety of gastropods and pelecypods within the channel sandstones and vertebrate and wood remains in the massive claystones in the middle member suggest both marine- and brackish-water conditions typical of a delta-plain environment.

The upper member of the Aguja Formation unconformably overlies the middle member and is composed of approximately 150 ft (45 m) of cross-bedded and massive-bedded sandstones, lenticular beds of limestone-pebble conglomerate, and minor amounts of claystone. Marine fossils are associated with some lenticular sandstones and include cephalopods, pelecypods, and gastropods. Vertebrate remains and petrified wood are present throughout the upper member. The upper member probably reflects a prograding upper delta-plain environment. Marine fossils associated with the lenticular sandstones may represent intermittent destructive phases during progradation.

The Aguja Formation was deposited within a deltaic environment as is indicated by the geometry of the claystones, channel sandstones, and humate-bearing units. The lower member represents a prodeltaic to lower delta-plain environment. The source area for the Aguja was probably on the west, northwest, and southwest as is suggested by paleocurrent indicators in the channel deposits.

KRASON, JAN, Geoexplorers International, Denver, CO

Volcanogenic Uranium Deposits and Associated Gold-Bearing Mineralization in U.S.S.R.

No abstract available.

LAMBERT, STEVEN J., Sandia Laboratories, Albuquerque, NM

Shallow-Seated Dissolution of Bedded Evaporites in Northern Delaware Basin

Studies of boreholes penetrating the Dewey Lake, Rustler, and uppermost Salado Formations in the northern Delaware basin (southeastern New Mexico) have investigated subsurface dissolution of bedded evaporites in the vicinity of Nash Draw, a depression 5 to 10 mi (8 to 16 km) wide and about 250 ft (75 m) deep. The thickness of the section between the top of the Salado Formation and the base of marker bed 103 ranges from an intact 210 ft (64 m, east of Nash Draw) to a residual 45 ft (14 m in the Draw), where gypsification of Rustler anhydrite and removal of Rustler halite are virtually complete. The uppermost Permian halite has been previously described as a dissolution zone (the "brine aquifer"). Within 130 ft (40 m) below this zone are halite-filled fractures, cubic-shaped cavities, and gypsum after anhydrite. Above are remnant "islets" of halite and anhydrite, gypsum replacing anhydrite and polyhalite, and dissolution breccia. The mineralogy and stratigraphy suggest that the shallow-seated "dissolution front" is a series of "fingers" moving laterally along bedding planes, rather than a single surface migrating downward. The sequence of alterations appears to be: (1) fracture of brittle rock, (2) dissolution of halite adjacent to the fracture rock, (3) gypsification of interbedded polyhalite and then anhydrite, and (4) dissolution of gypsum. Waters of higher salinity and lower flow rate in the "brine aquifer" east of Nash Draw show an oxygen isotope enrichment with respect to meteoric waters, indicating that the low fluid-to-rock ratio there has thus far precluded significant alteration of rock by water.

LIDDICOAT, J. C., Lamont-Doherty Geol. Observatory, Palisades, NJ, J. E. HAZEL, U.S. Geol. Survey, Reston, VA, E. M. BROUWERS, U.S. Geol. Survey, Denver, CO, et al

Magnetostratigraphy of Upper Cretaceous Deposits in Southwestern Arkansas and Northeastern Texas

Interpretation of preliminary paleomagnetic (a.f. demagnetized) and biostratigraphic data from Upper Cretaceous deposits suggests that the Nacatoch Sand (Navarroan) and the Brownstown Marl (Austinian) of southwestern Arkansas correlate with Guffio (Italy) reversed polarity zones E- and A-, respectively. Other Austinian, Tayloran, and Navarroan Upper Cretaceous deposits (Tokio Formation, Ozan Formation, Annona Chalk, Marlbrook Marl, Saratoga Chalk, Arkadelphia Marl, Gober Chalk, Sprinkle Formation) possess a weak remanent magnetization of normal paleomagnetic polarity. We assume the normal polarity to be primary magnetization, and interpret deposition of the Tokio Formation during the Gubbio long normal zone (Santonian and older), and that of the other units in Gubbio normal polarity zone B+ (Campanian to early Maestrichtian); this is consistent with previous assignments of the units to stages on the basis of biostratigraphic data.

We conclude that the boundary between the Austinian and Tayloran provincial stages approximates the boundary between the Gubbio reverse polarity zone A and the Gubbio normal polarity zone B+. The Tayloran-Navarroan boundary is probably within the upper part of Gubbio normal polarity zone B+.

The magnetostratigraphic approach for refinement of the