tween the Henryhouse and Haragan follows. (1) At the specific level the two faunas are completely distinct; no species are common to both units. (2) Of the 28 genera in the Henryhouse, 13 are restricted to it. Twelve of the 27 Haragan genera are not present in the Henryhouse. (3) The two faunas are nowhere known to occur together or interfinger with one another. (4) The faunal change is abrupt. There is no evidence for an intermediate (gradational) fauna between the two distinct faunas recognized.

The stratigraphic distribution of ostracodes within the Henryhouse and Haragan Shales indicates no definite biostratigraphic zonation within either unit. Each species which is significantly abundant ranges throughout, or almost throughout, the unit in which it occurs. The Henryhouse and Haragan Shales are distinct and discrete stratigraphic units, each having its own ostracode fauna.

Detailed sampling of the Henryhouse and Haragan formations has been carried out in all the outcrop areas of the Hunton Group, which consists of four formations, in descending order: Bois d'Arc Limestone, Haragan Shale, Henryhouse Shale, and Chimneyhill Limestone. The ostracode faunas obtained are distinctive and readily identifiable. Eleven ostracode species previously described as Haragan species are now known to have come from, and to be restricted to, the Henryhouse Shale. The ostracode faunas are distinct and discrete. Therefore, the Siluro-Devonian contact in south-central Oklahoma is unconformable.

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Textures and Structures in Catahoula (Gueydan) Tuff, South-Central Texas

The Catahoula Tuff of Oligocene to early Miocene(?) age is composed almost entirely of volcanic rock debris or its alteration products. Pastel-colored tuffaceous clay predominates, but sandstone, conglomerate, bentonite, vitric tuff, and ash also are present. The rocks studied in outcrop have a maximum thickness of approximately 900 feet, and were deposited largely on a coastal plain not far from shore. Bed geometry and sedimentary textures and structures provide evidence that the coarse clastic sediments and some tuffaceous clay beds were deposited as mudflows. One bed of air-fall ash has been recognized by its geopetal fabric: conical piles of glass dust rest on flat shards.

Vitric tuff and tuffaceous clay beds deposited as mud flows are characterized by massive (structureless) beds 1–4 feet thick, lack of sorting in beds that have particles ranging from fine ash to pebble-size tuff intraclasts, orientation of shards in random or swirl patterns, and desiccation polygons. One variety of tuff is characterized by moderate induration and the presence of tuff pisolites. The pisolites are generally 1–5 mm. in diameter and comprise as much as 30 per cent of a rock. Pisolites differ from their matrix by having different amounts or different sizes of shards and, in places, an opaque rind. A few pisolites grade imperceptibly into matrix of identical composition and texture where part of the rind is absent. The pisolites developed in tuffs by soil-forming processes, probably in an arid climate with seasonal rainfall. Many pisolites were reworked into successive mud flows.

Another variety of tuff is well indurated and pervaded by sinuous tubules (up to 2 mm. in diameter) probably formed by plant roots. The tubules trend in all directions but are predominantly vertical. Tubules in some beds are filled with zeolite (heulandite group) or montmorillonite.

Stream-deposited tuff is recognized by faint horizontal laminations and cross-bedding and by moderate sorting and sub-parallel orientation of elongate shards and tuff intraclasts. This type of tuff is friable, non-pisolitic, and lacks tubules. Pores in many of these tuffs are now reduced in size or filled by clay skins of montmorillonite that coat framework grains.

Bentonite is free of crystal fragments, has no relic texture, and has a random orientation of montmorillonite particles. The lack of orientation of clay particles suggests that they crystallized during the *in situ* argillation of beds of glass dust rather than by sedimentation of clay particles in quiet water.

Clay dikes from 1 mm.–2 cm. wide trend vertically through tuff and sandstone at some localities. Montmorillonite grains are well-oriented parallel with the dike walls, suggesting particle-by-particle deposition from injected slurries.

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Exploration Objectives in the Cambro-Ordovician of Kentucky

The Cambro-Ordovician of Kentucky is a new frontier for petroleum exploration. Dolomite, limestone, and sandstone reservoirs, both proved and potential, provide the oil-seeker with a large number of objectives ranging in age from Early Cambrian to Middle Ordovician and are present at drilling depths of 1,000–14,000 feet.

Dolomite reservoirs associated with the pre-Chattanooga unconformity have produced more than 150 million barrels of oil in Kentucky. Present activity, directed toward the testing of the Knox Dolomite, is a logical extension of exploratory effort downward to the next major unconformity.

The pre-Chazy unconformity in Kentucky was developed on dolomite beds of the Beekmantown. Traps below the unconformity are associated with pre-Chazy structures—faulting, erosional remnants, and truncated porous zones. Vuggy, intercrystalline, and fracture porosity zones occur throughout the Knox Dolomite section, and in many instances appear to be related to specific stratigraphic zones.

The predominantly clastic Conasauga-Rome section below the Knox Dolomite includes potential, but unproved, sandstone and carbonate reservoirs of wide geographic extent. Thickness variations and structural relief in the order of several thousands of feet, coupled with facies changes and known shows of oil and gas, provide the incentive for exploration.

The best guide to exploration will be the reconstruction of Cambro-Ordovician tectonic frameworks and depositional environments. Large structural surface features must be evaluated on the bases of age and structural history.

All types of exploratory techniques, from surface geology to geophysics, are applicable to the search for Cambro-Ordovician oil in Kentucky.

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Coccolithophorids as Ecologic Indicators in Oceanic Sediments

The minute, calcitic, skeletal elements (coccoliths) of the Coccolithophoridae constitute 5–20 per cent or