interdepositional tectonics and not subsidence contemporary with sedimentation.

The above three points support the validity of the concept that the Devonian Famennian, Givetian, and Eifelian evaporite-basin configurations are not simply the result of differential sedimentary tectonics but are mainly eroded structural remnants. Supporting this concept are detailed stratigraphic subdivisions suggesting that these basins or lenses are only remnants of originally much more expansive evaporite depositional regions.

These basins are analogous to structural basins in contemporaneous open-marine sedimentary provinces. Post-depositional epeirogenic movement and vast areal erosion have left thick broad lenses or wedges of evaporite sections—regionally defined as evaporite provinces of deposition.

In searching for hydrocarbon accumulations among structural and stratigraphic traps within the evaporite complex, one has to consider these critical factors—the supra-evaporite basin unconformities and their tectonic origin.

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ANOMALOUS MORROWAN-CHESTERIAN CORRELATIONS IN WESTERN ANADARKO BASIN

Fossils recovered from cores of a thin lignitic shale and a coal in two widely separated wells in the western Anadarko basin show that the shale and coal beds are time-equivalent. Spore-pollen assemblages from the two intervals are identical and indicate a late Morrowan age.

Coal from one well in the western Oklahoma Panhandle is from an interval generally considered as late Morrowan; the lignitic shale from a well near Liberal, Kansas, however, is from rocks widely accepted as early Chesterian—almost Meramecian.

Considering that there is a span of several million years between early Chesterian and late Morrowan, two possible interpretations are presented. Either (1) identical spore-pollen assemblages are not sufficient evidence to distinguish between early Chesterian and late Morrowan or (2) some rocks currently accepted as of Chesterian age in the western Anadarko basin actually are limestone-shale facies of the Morrow Formation, and the relation between Morrowan sandstone-shale and "Chester" limestone-shale would not be one of onlap on an unconformable surface but, instead, a major facies change. In the two wells the interval between the Meramecian St. Genevieve Limestone and the Atokan "13-finger" limestone is nearly equal and analysis of the geologic history of this interval lends support to the facies interpretation. Either interpretation is provocative and could have economic consequences.

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SEDIMENTARY FACIES IN AREA OF MIXED TERRIGENOUS-CARBONATE DEPOSITION, ARLINGTON REEF COMPLEX AND ADJACENT AREAS, NORTHERN GREAT BARRIER REEF

The northern Great Barrier shelf can be divided into 3 major bathymetric zones: (1) the nearshore zone, extending to depths of 5 fm; (2) the inner shelf, extending to depths of 20 fm; and (3) the marginal shelf extending to the shelf edge at 40–50 fm. In the area studied, reef development is concentrated on the inner two thirds of the marginal shelf.

Sedimentary facies in this area reflect three major influences: (1) source (terrigenous and carbonate); (2) hydrography; and (3) relic facies. On the inner shelf, nearshore terrigenous sand is succeeded seaward by dominantly terrigenous mud which transgresses two pre-Recent facies: (1) terrigenous sand in the north and (2) shell gravel in the south. Mixing of pre-Recent sediments, terrigenous mud, and modern carbonates (molluscan and foraminiferal) complicates the basic pattern. Both pre-Recent facies extend to within 1 mi of the reef with no significant dilution by modern reef-derived debris.

Major interreef channels are floored by fine-grained, mixed terrigenous-carbonate sediment. The terrigenous material (30–50 percent) is dominantly silt and clay size. The identifiable, carbonate fraction is composed mainly of planktonic and benthonic Foraminifera, juvenile and larval mollusks, and skeletal debris. Most of this channel-floor sediment apparently is derived either from the inner shelf or from the open ocean; little appears indigenous.

The main reef complex is built on a 16-fm platform, and encloses a central area of about 64 sq mi. Much of the interior platform is covered by low coral growth or by dead coral with a thin cover of worn, broken, and stained skeletal grains, mainly large Foraminifera, *Halimeda,* and coralline algae. Major sediment accumulation occurs only in the lee of the main reef where quiet-water conditions allow the deposition of carbonate mud with up to 18 percent fine terrigenous detritus. The sparse coarse fraction is molluscan, Foraminifera increasing in abundance near the reef. Reef-derived sediment is abundant only on and directly adjacent to the reefs.

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YELLOW BANK, BAHAMAS: A STUDY OF MODERN MARINE CARBONATE LITHIFICATION

An 1,800-sq-mi area of the New Province platform in the Bahamas was studied in an attempt to evaluate an occurrence of modern marine lithification.

Studies of samples collected from the surface and from vertical profiles of modern carbonates have demonstrated the following: (1) facies variations are more pronounced vertically than horizontally; (2) recrystallization cannot be detected in samples as old as 6,700 yr B.P. that are 8 ft below the water-sediment interface; (3) aragonite is the only form of carbonate cement; and (4) lithification appears to be restricted by depth of water between 9 and 16 ft deep, and is absent in water deeper than 19 ft.

In all localities where lithification occurs, water-sediment bioherms are present. Although these bioherms do not extend into the overlying water, they are present in the sediments to a depth of 3 ft below the water-sediment interface.

For paleoecologic data, bioherms in ancient carbonates should be restudied in an attempt to determine if they actually stood above the water-sediment interface as is so commonly pictured.