ride-calcium or chloride-magnesium gave a positive index of base exchange when classified by Schoeller's method. Waters known to be in contact with petroleum were classified by Sulin's method and were found to be of the chloride-calcium, chloride-magnesium, and bicarbonate-sodium types, but not of the sulfate-sodium type.

It was concluded from the study that classification of the above types of data from water analyses would not be positively indicative of petroleum, but might have some application as an aid in exploration. Water classification could, in some instances, be used to identify formations, analyses for organic and minor constituents dissolved in waters associated with petroleum formation will add to the value of data from water analyses. It was found that unless extreme care is used in obtaining water samples for classification or formation identification, contaminated samples will give erroneous results.

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ROCK-BORING ORGANISMS AS MARKERS OF STRATIGRAPHIC BREAKS

Borings made by various kinds of organisms are characteristic of many disconformities from the Ordovician to the Recent. Borings are especially abundant on Jurassic, Cretaceous, and Tertiary discontinuity surfaces in shallow-shelf carbonate sequences. The organisms that made most of these borings are mollusks, sponges, various kinds of worms, barnacles, and algae. Of these groups the bivalve mollusks are the most common and most highly adapted borers.

The recognition of the rock borings and their distinction from burrows made in unlithified sediment commonly is necessary for the identification of otherwise obscure disconformities. Rock borings in carbonate sequences imply stratigraphic breaks with histories of (1) emergence, (2) lithification, and (3) resubmergence; whereas, in the same sequences burrows do not necessarily imply any sort of stratigraphic break. Shapes of burrows and borings and relations with sediments and structures are reviewed as the essential criteria for recognizing borings and bored surfaces and for distinguishing them from burrows and burrowed surfaces.

Cretaceous and younger rock sequences of Texas and Mexico include many disconformities characterized by borings. The magnitude of the stratigraphic breaks which these bored surfaces represent ranges from local intraformational interruptions to major intersystemic unconformities. Examples of these surfaces are compared in terms of (1) surface morphology, (2) encrusting faunas, (3) shape and variation of borings, (4) corrosion features, (5) areal extent, and (6) lateral correlatives.

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EAGLEFORDIAN (CENOMANIAN—TURONIAN) STRATIGRAPHY IN MEXICO AND TEXAS

The biostratigraphy of the San Felipe Formation of Mexico and the correlative Eagle Ford Group of Texas has been studied extensively from well cores and measured sections. The San Felipe was examined in outcrop at Boca Canyon south of Monterrey whereas the Eagle Ford was studied at Chispa Summit in Jeff Davis County, at Lozier Canyon near Langtry, at Sycamore Canyon near Del Rio, on Bouldin Creek in Austin, at Atco near Waco, and at the type locality at Dallas.

Previously, Eaglefordian strata in Texas and Mexico were included in the ***Rotalipora cushmani-greenhornensis*** Subzone of the ***Rotalipora*** s.s. Assemblage Zone and the ***Marginotruncana sigali*** and ***Whiteinella archaeocretacea*** Subzones of the ***Marginotruncana helvetica*** Assemblage Zone. At Boca Canyon in Mexico all of these units are represented. Through most of Texas, however, sampling indicates that the *Marginotruncana sigali* Subzone is consistently absent, and the *Whiteinella archaeocretacea* Subzone rests unconformably on strata assignable to the *Rotalipora cushmani-greenhornensis* Subzone of the *Rotalipora* s.s. Assemblage Zone.

In view of these discoveries, the writer proposes to subdivide the Eaglefordian Stage of the standard Gulf Coast Upper Cretaceous section into three substages: (1) the Lozierian (late Cenomanian), (2) the Bocian (early Turonian), and (3) the Sycamorian (late Turonian).

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DISTRIBUTION AND ORIGIN OF PENNSYLVANIAN CARBONATE MOUNDS, PARADOX BASIN

Shelf carbonate mounds of Desmoinesian (Pennsylvanian) age were developed in cyclic repetition along the southwestern flank of the Paradox basin. Optimum carbonate deposition occurred in an elongate northwest-southeast belt, approximately 50 miles wide and over 100 miles long, which contains about 35 Pennsylvanian oil and gas fields. Porosity occurs in three types of carbonate reservoirs: algal plate mounds, foraminiferal mounds or bioherms, and "leached oölite" banks. Most of the production is from limestone, but dolomite also is important as a reservoir rock.

Stratigraphic-facies mapping of the mound-bearing strata can be done on the basis of basin-wide, black, sapropelic shale marker beds, in conjunction with lithologic-petrographic analysis of rock types and associated faunal content. Shelf carbonate rocks occur in each main cycle of the Paradox Formation, grading basinward into evaporite and shoreward into sandy limestone and terrigenous clastic rocks.

The origin, distribution, and cyclic repetition of the carbonate-mound belts are thought to be related to periodic eustatic changes in sea-level associated with late Paleozoic glacial cycles of the Southern Hemisphere. The mounds probably developed along shallow-water mud banks or platforms which built basinward during the early clastic phase of each cycle. Completeness and duration of a cycle were major factors in determining the size attained by the mound complex.

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RATES AND MECHANISMS IN FORMATION OF DOLOMITE

Dolomite is forming in Deep Springs Lake, California, and marine-associated Coorong lakes of South Australia. Dolomite forms via a surface-layer precursor, which is commonly calcium-rich in comparison