quences, grouped in four supersequences, have been recognized in the Pelotas, Santos, Campos, Espírito Santo, Cumuruxatiba, Sergipe-Alagoas, Potiguar, Barreirinhas, and Foz do Amazonas basins along the Brazilian continental margin.

In general, the sequences are bound by sharp breaks on seismic sections separating distinct seismic-stratigraphic patterns. The most common breaks include: the top of Albian-Cenomanian post-rift carbonate rocks; the top of lower Eocene or Paleocene, coincident with a change in the subsidence regime of the margin; the boundary between lower and upper Oligocene; the base of lower Miocene that marks the beginning of a well-developed progradational episode; the base of middle Miocene, and an upper Miocene top, both indicating major transgressions along the continental margin.

The sequences were analyzed and correlated along the basins by their main seismic and geologic parameters, being recognized by different depositional styles.

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Process for Primary Migration of Petroleum in Sedimentary Basins

No abstract available.

BREINER, SHELDON, GeoMetrics, Sunnyvale, Calif.

Exploration Geophysics in People's Republic of China

Details of exploration geophysics instruments and techniques in the People's Republic of China are relatively unknown to those outside the country. The People's Republic, a country the size of the United States, with relatively large mineral and petroleum resources, since its founding in 1949, has conducted more or less continuous geophysical exploration by vast teams of geologic and geophysical personnel.

In 1974 and 1977, the writer visited exploration geophysical personnel in the People's Republic of China; the latter visit was at the invitation and expense of the State Bureau of Geology. During each 3-week visit, various laboratories, institutions, geophysical instrument factories, computer centers, and other technical installations were visited. Included in these facilities were the large Ta Ching oil field in Manchuria; the geophysical instrument factories in Peking, Shanghai, and Changchung; the Geological College in Changchung; and various State Bureau of Geology personnel in other cities. During these visits the writer compared the state of exploration geophysics, associated technology, and current activites with present geophysical practice in the United States and other Western countries.

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Role of Bioerosion in Mass-Wasting of Pleistocene Outcrops on Georgia Coast

Outcrops of semiconsolidated Pleistocene sands, exposed by meandering tidal rivers and creeks in the Georgia estuaries, are undergoing rapid disaggregation by a variety of plants and animals. Bioeroders include large and small mammals, wasps, crabs, isopods, and pelecypods. In this area, bioerosion is responsible for retreat of bluffs as high as 15 m and contributes significantly to mass-wasting and subsequent erosion by currents and waves.

Blocks initially break away from the bluffs along fractures created by plant roots. As the blocks move downslope they serve as substrates for numerous supralittoral, littoral, and sublittoral invertebrate organisms which burrow, bore, and scrape the blocks as well as the bluff itself. Different organisms are restricted to distinct vertical zones and the degree of bioerosion increases to a maximum at the low-water line where boulders are riddled with borings, mainly by the isopod *Sphaeroma destructor*. Multiple isopod borings are in turn further eroded to form large burrows and galleries occupied by crabs. Rates of excavation and colonization of exposed surfaces are rapid, and obvious changes occur in periods of less than 2 weeks.

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Three-Dimensional Seismic Interpretation Methods

A 3-D seismic survey provides a volume of closely spaced accurate three-dimensionally migrated data. From this data volume, the seismic interpreter has a wide variety of display options available: two-dimensional slices, both vertical and horizontal, and three-dimensional displays of the data volume itself. Thus the interpreter can study a subsurface feature on a two-dimensional section of chosen orientation or in three dimensions. He has, however, a very large quantity of data to examine before arriving at a final interpretation of the prospect.

Interpretation of Seiscrop (trademark of Geophysical Service, Inc.) horizontal sections provides a fast, convenient, and effective way of interpreting the data volume. Seiscrop sections displayed every 2 or 4 msec and made into a motion picture are used in conjunction with the Seiscrop Interpretation Table to build horizon contour maps directly. Seiscrop sections are an easy and successful means of delineating flat spots or small structures. In "flat" spots which are not quite flat because of lateral velocity gradients, composite Seiscrop sections from more than one record time are used. Seiscrop sections are also used for stratigraphic interpretation.

Seismodel (trademark) Display Unit is a means of viewing many vertical slices through the data volume simultaneously. This permits the interpreter to see structural and stratigraphic features in three dimensions. Each vertical section is on a separate demountable transparent plate. The interpreter removes and marks each plate in turn to develop his interpretation in three dimensions.

Reflection holography is also used to display a 3-D data volume. Many vertical seismic sections are stored on a single holographic plate. The data are then recon-

structed in three dimensions by illuminating the plate with white light or light rich in the wavelength to which the hologram is tuned.

BROWN, LEWIS R., Mississippi State Univ., Mississippi State, Miss.

Microbiological Prospecting for Hydrocarbons

No abstract available.

BROWN, R. H., Shell Oil Co., Houston, Tex., and F. B. VAN HOUTEN, Princeton Univ., Princeton, N.J.

Early Mesozoic Tectonic Framework and Sedimentation, Northwest Africa

In northwest Africa, Triassic and Early Jurassic deposits accumulated in two different tectonic provinces, the African platform and the Variscan (Hercynian) orogene.

In southern Algeria and Tunisia, Lower, Middle, and Upper Triassic sediments, essentially devoid of volcanic materials, were deposited on the stable African platform south of the Saharan flexure (South Atlas fault zone). Here the basal Triassic beds lie on a post-Variscan unconformity which marks a progressively longer hiatus northward toward the orogene. The sequence consists mainly of nonmarine arenaceous and argillaceous evaporite facies, with intercalations of marine limestone and dolomite increasing toward the northeast. These deposits resemble correlative ones in western Europe. On the unstable eastern cratonic margin and adjacent southwestern corner of the Pelagian block (Djeffara Plains) Lower Triassic detrital paralic sedimentary rocks conformably overlie a thick succession of Permian marine strata.

Most of the Variscan province apparently was stable and emergent during Early and Middle Triassic times. Nevertheless, the mid-Triassic Tethyan transgression that spread a carbonate-evaporite mantle across central and northern Tunisia did encroach westward onto the eastern part of the orogene. Early Mesozoic extensional deformation of the Variscan domain produced differential vertical displacement along the Saharan flexure between the orogene and the African platform, as well as on the orogene along the central Altantic, Middle Atlas, and Gibraltar fracture zones. In the west, this deformation outlined the Moroccan and Oranian mesetas which remained relatively stable and were extensively eroded during early Mesozoic time. Red beds, evaporites, and basaltic flows filled the basins. Although poorly dated by fossils, their linear pattern and discordant boundaries, and radiometric ages of the volcanic rocks, indicate that the basins were formed during the Late Triassic extensional phase that disrupted eastern North America.

BROWN, ROGER E., and BRUCE H. WILKINSON, Univ. Michigan, Ann Arbor, Mich.

Draney Limestone—Early Cretaceous Lacustrine Carbonate Deposition in Western Wyoming and Southeastern Idaho

The Lower Cretaceous Draney Limestone, a lenticular carbonate sequence well exposed throughout the Overthrust belt in western Wyoming and southeastern Idaho, records deposition in an extensive, shallow, low-salinity lacustrine system that minimally covered 30,000 sq km. The predominant lithologies of calcareous mudstone, micrite, intramicrite, and biomicrite contain a lacustrine biota composed predominantly of ostracods and the calcareous alga *Chara*, with less common bivalves and gastropods. The continuity of the Draney throughout the area indicates that this lake was a more or less continuous body of water throughout deposition. Individual units within the Draney, however, cannot be correlated over large distances; this fact suggests significant local chemical and/or physical variations within the lake basin during carbonate deposition.

The lake appears to have been relatively shallow throughout its extent, as evidenced by the presence of winnowed sandy biomicrite and the ubiquitous *Chara*, which in modern systems is restricted to shallow photic zones. Limonitic calcareous mudstones which exhibit well-developed calcite boxwork fabrics and vugs filled with calcite spar indicate infrequent subaerial exposure and alteration of lake sediments. Modern playa systems do not serve as a satisfactory analog to the Draney lake because features indicative of (1) frequent subaerial exposure, (2) deposition in exceedingly shallow water, or (3) coprecipitation of more evaporitic minerals have not been observed in the Cretaceous sections. On the contrary, lithologic, faunal, and floral features of Draney strata are more nearly identical to those of marl deposits in modern, temperate-region, hardwater lakes. Therefore, Cretaceous carbonate deposition under somewhat similar conditions is suggested.

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Regional Hydrocarbon Source-Rock Evaluation of Atlantic Coastal Plain Adjacent to Georgia Embayment

In January 1978, GeoChem Laboratories completed a regional hydrocarbon source-rock study involving 13 wells in the Atlantic coastal plain adjacent to the GE-1 COST well. The purpose of this study was to characterize the geochemical zones within the stratigraphic section of the individual wells, to establish their onshore hydrocarbon generating potential, and to assist in the evaluation of the Georgia embayment by projection of the geochemical data into the offshore region.

Although the analyses were performed on the Tertiary through Lower Cretaceous sediments, only the Upper Cretaceous section exhibited source-generating potential. Evaluation of the sediments as to total organic content (richness), organic-matter type (prone to be gas-, condensate-, or oil-productive), and state of thermal maturity, showed that both the Selma Group of the Upper Cretaceous (Navarro, Taylor, and Austin Formations) and the Tuscaloosa exhibit good to very good source-generating potential. This favorable potential appears to extend into the offshore region to the northern part of the blocks involved in OCS Sale 43, held in March 1978. Unfortunately, the Upper Cretaceous ap-