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SALT TECTONICS OF THE CUANZA BASIN, ANGOLA, PORTUGUESE WEST AFRICA

The Cretaceous Cuanza basin is located in northwestern Angola on the Atlantic coast of West Africa. This composite basin, 315 km. long, north-south, and 170 km. wide, east-west, consists of an early Cretaceous carbonate-reef barrier-evaporite sequence succeeded by a late Cretaceous clastic-carbonate sequence. The basement is composed of Precambrian crystalline rocks, Paleozoic metasediments, and post-Paleozoic crystalline rocks. Surface of the basin consists of Upper Cretaceous, Paleocene, Eocene, and Miocene strata, with much of the area covered by a thick, red, lateritic, Pleistocene sandy soil.

The middle Aptian sel massif was deposited to a maximum thickness of about 600 meters in response to an early off-shore tectonic welt or fault in the basement, possibly coupled with early Aptian barrier reef growth to create a semi-locked evaporite basin.

Salt tectonism of early to middle Cretaceous age involves (1) regional lateral salt movement of 1 to 15 kilometers, probably initiated by basement faulting; (2) subregional salt shifts in response to clastic loading from the east and barrier reef loading on the west; (3) local to subregional horizontal salt shift and vertical expansion to form anticlines in response to local reef buildup, as well as basement folding and wrenching, and local trough-like clastic loading; (4) final diapiric salt intrusion in waves with amplitudes of 2,000 meters, initiated in Oligocene time, and operative today; (5) Miocene *fosse* foundering (normal graben faulting) with filling by deltaic clastics; and (6) renewed right lateral wrench-faulting.

An early, low-amplitude Cretaceous regional salt movement, important to initial oil migration and accumulation, was followed by Oligocene diapirism which destroyed several large oil accumulations. Both took place in locales where the initial deposition of the massive salt was the greatest.

Oil exploration of both the pre-salt and post-salt Cretaceous strata in the Cuanza basin today depends upon detailed unravelling of the salt tectonic history.

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DIAPIRIC AND ASSOCIATED STRUCTURES ON THE SABANA DE BOGOTÁ, COLOMBIA

Several diapiric and related salt structures are located on the Sabana de Bogotá, an elevated rolling upland 2,500 to 3,000 meters above sea-level in the central part of the Cordillera Oriental. The structures, which are exposed in locally exploited salt mines, are composed of salt and interbedded euxinic shales of late Triassic or Jurassic age. The association of the salt deposits with Upper Cretaceous formations necessitates a penetration of more than 13,000 meters of predominantly clastic sediments.

The structures, like those in Rumania, are thought to be the result of horizontal stress. It is believed that they had their inception during very recent geologic time, possibly as late as Pliocene or even Pleistocene.

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RESPONSE MODEL DESIGN FOR A RHYTHMIC DELTA-PLATFORM DOMAIN, DEVONIAN CATSKILL COMPLEX OF NEW YORK

Investigation of the physical stratigraphy of the Middle and Upper Devonian of southeastern New York has shown that this sequence of the "Catskill Deltaic Complex" might be separated naturally into a set of sedimentary domains. The North Point (lowermost Upper Devonian), one of these domains, is characterized by rhythmic patterns in sediment color, texture, and petrology; sedimentary structures; sediment transport directions; lithologic sequences; and lithosome geometries. The rhythmically recursive sequence of the North Point consists of (in ascending order): (A) polymictic conglomerate, (B) gray conglomeratic subgraywacke, (C) gray subgraywacke, (D) red subgraywacke, (E) red siltstone, (F) red mudrocks, (G) olive mudrocks, (H) gray mudrocks, and (I) sub-protoquartzite.

Various physical and statistical models of source, distribution, accumulation, and modification realms of the process-response system of the North Point were simulated on an electronic computer. The algorithm for a model of the process-response system of a rhythmic sequence, obtained by integration of relative aspects of these models, may be approximated by six sub-sets of equations; each sub-set is an attempt to characterize the status of process elements in the development of a response phase.

Translated into operational format these phases are: (1) early regressive phase (units A, B,); (2) middle regressive phase (B, C); (3) late regressive phase (D, E); (4) paralic stability phase (E, F); (5) early transgressive phase (G, H); and (6) late transgressive phase (H, I). The general aspect of this model is coarse-grained sediments (A, B, C) passing upward into finer sediments (E, F, G. H), forming a platform sequence which is rhythmically recursive. Homogenization at the strand zone and re-organization on the distal portion of the platform produces an inverted sequence (fines grading upward to coarser units). This model recognizes two components of subsidence, local and regional, as dominant process elements of the accumulation realm. The regional component is decomposed into the effects produced by compaction of the underlying sediment pile and those produced by subsidence of the Devonian subbasin. The local component results from surface and near-surface compaction of sediment deposited during phases 3, 4, and 5 (units E, F, G, H) of a rhythmic sequence. The algebraic sum of the interaction of these two process elements may have profound effects on the character and mode of the response, producing transgression in one part of the domain, while regression or stability characterizes another part.

Within the framework of this model the rhythmic character of the North Point is thought to be the response to the interaction of: (1) source contribution activity; (2) design of transport and dispersal systems; (3) influence of sub-basin and platform dynamics on the character and mode of the accumulation; (4) modification of the accumulation by processes such as compaction, erosion, diagenesis, and structural adjustments.

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A SEDIMENTARY MODEL OF THE CONTINENTAL MARGIN OFF OREGON

The continental margin west of Oregon consists of a generally convex-upward surface 35 to 60 nautical miles wide. The continental shelf, which forms the upper part of the surface, slopes seaward at less than one degree and ranges irregularly in width from 9 to 35 miles. Several elongate hills or banks rise above the general