

dissolution associated with hydrocarbon maturation-migration.

The understanding of these subsurface cements helps decipher the diagenetic history of carbonate rock sequences during progressive burial and can be particularly helpful in timing hydrocarbon migration.

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#### Development and Infilling of the South Pass Shelf-Edge Failure Bowl, Offshore Mississippi Delta

The South Pass shelf-edge failure complex, which extends from the continental shelf edge to the Mississippi fan, is one of several expressions of late Pleistocene seafloor failure identified off the Mississippi River delta. The headward portion of this feature lies within a 240 km<sup>2</sup> (93 mi<sup>2</sup>) study area located 22 km (14 mi) south of South Pass. Water depths within the area range from 50 to 400 m (165 to 1,300 ft). High-resolution sparker and Acousti-pulse seismic data have been correlated with borehole information and radiocarbon dates to document the failure and subsequent infilling of the headward bowl of this massive feature.

Radiocarbon dating of the sediments cut by the failure feature suggest that it was formed 25,000 to 20,000 years ago. The buried failure surface represents the evacuation of a slab of sediments approximately 200 m (660 ft) thick with a volume of 40 km<sup>3</sup> (9.5 mi<sup>3</sup>) from within the study area. Dating of the post-failure sediments indicates that the infilling process was essentially complete by 15,000 y.B.P.

Seismic stratigraphic techniques, and lithologic and geotechnical borehole data were used to subdivide the evacuation and infilling into seven stages. These stages are represented by four surfaces of unconformity and the sediment packages they enclose. Sea level, morphology of the depositional surface, contemporaneous structure, sediment accumulation rate, depositional source, and erosion controlled the duration and development of these stages.

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#### Lake-Margin Deposition in Ensialic Rift Basins—The Miocene Chalk Hills Formation of the Southwestern Snake River Plain

Over 120 m (400 ft) of terrigenous sediment within the Miocene Chalk Hills Formation was deposited in proximal to distal fluvial to lacustrine settings during extensional tectonism along the southwestern Snake River Plain. spectacular exposures of basin-fill facies along deep tributary gorges allow for detailed reconstruction of major sedimentary environments along this extensional basin margin.

Vertically, Chalk Hills sediments comprise a transgressive sequence of fluvial-floodplain, marginal lacustrine, and deep lake systems which progressively onlap basin-margin silicic volcanics. Fluvial-floodplain facies, deposited in and along large, slightly sinuous rivers, consist of trough-cross-bedded boulder gravel to coarse sand paleochannels which incise floodplain fine sands and muddy silts. These pass basinward and vertically into coarse, marginal lake facies, commonly exhibiting tabular cross-sets in excess of 18 m (60 ft) in thickness, with individual inclined units reaching 1 m (3.3 ft) in thickness. These constructional units are characterized by dips to the northeast of 15 to 22°.

Closely spaced sections demonstrate that most well-developed foreset-topset couplets have great extent along the basin margin, and were probably deposited as lateral benches which repeatedly developed along interfluvial headlands. Coarse sediment supplied from one or more fluvial sources along the lake margin was winnowed by waves on shallow bench platforms prior to deposition on steep basinward-dipping bench slopes. In addition, localized Gilbert-type deltas may have been responsible for lobate cross-set sequences which are laterally restricted in comparison to the tabular cross-sets which characterize bench sequences. Marginal lake facies in turn grade basinward and upward vertically into deep lake silts and muds which were deposited during continued lake transgression over steep lake margin volcanics. These units are commonly horizontally bedded or massive.

Unlike lacustrine systems deposited in broad compressional intermontaine basins, facies within the Chalk Hills Formation of the southwestern Snake River Plain exhibit abrupt lateral and vertical changes, recording both spatial narrowness and temporal instability of fluvial-lacustrine transitional environments in extensional rift basin settings. The unique relationships exhibited by these sediments, resulting from tectonic instability, may be characteristic of many rift-valley lacustrine systems.

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#### Radiolarians in Plankton Samples from Ice-Covered Antarctic Waters

Plankton tows taken within the Antarctic sea ice in late October through November 1981, as part of the US-USSR Weddell Polynya Expedition contain numerous varieties of polycystine and triplylean radiolarians. Fifteen tows at nine sites sampled the zooplankton at specific intervals within the water column along a north-south transect extending over 300 km (190 mi) within the ice.

Although chlorophyll A levels were relatively low ( $\leq 0.1$  mg/m<sup>3</sup>) in samples taken under the ice, the total number of polycystine and triplylean radiolarians per cubic meter of filtered seawater ranged from 20 to 50% of that reported from open-ocean sites. At several of the ice stations, the number of radiolarians per cubic meter of filtered seawater was similar to that recorded at the ice edge, even though ice-edge chlorophyll levels were 100% higher than levels at sites in the ice. The relatively high number of radiolarians found under the ice is even more unusual considering that the region has been completely ice-covered for a minimum of 4 months prior to sampling.

Although most species were found living above and below the thermocline/halocline, specific species such as *Spongotrochus glacialis* Popofsky and *Lithelius nautiloides* Popofsky were most abundant in tows which sampled the water column above this oceanographic boundary. Comparison of this plankton-tow data with that from Antarctic surface-sediment samples shows, that with few exceptions, the relative abundances of specific polycystine species in the water column are comparable to those found in the surface sediments.

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#### Extending Present Coal Reserves with Self-Bursting Coal Pellets

A new scheme is proposed which would extend our present reserves of coal by making use of what is now a waste product.