pressions rather than a transport process unique to the trench environment.

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Isotopic Composition and Sources of Strontium in Sandstone Cements in High Plains Sequence of Wyoming and Nebraska

The $^{87}Sr/^{86}Sr$ ratios of sandstone cements reflect the isotopic composition of strontium released into the pore fluid by different rock and mineral constituents. However, little is known about the extent to which the isotopic compositions of strontium in cements reflect local or regional variations in sandstone compositions. The $^{87}Sr/^{86}Sr$ ratios of sandstone cements permit identification of the major sources of strontium in the pore fluid and indicate the dimensions of the aquifer system within which the pore fluid was isotopically homogenized. Since the abundances of radiogenic ^{87}Sr is continually increasing by decay of ^{87}Rb, isotopic compositions of strontium may also suggest the sequence and time of cement formation in sandstones that contain detrital mineral and rock grains having high Rb/Sr ratios.

After removing the calcite, montmorillonite, or zeolite cements, sandstones from the Arikaree and Ogallala Groups of the High Plains sequence (Oligocene to Pliocene) have $^{87}Sr/^{86}Sr$ ratios ranging from 0.7065 for plagioclase arenite to 0.7491 for arkosic arenite; rhyolitic vitric ash samples have intermediate ratios of 0.7093 and 0.7133. In contrast to the detrital fractions of the sandstones, the cements contain strontium that is isotopically homogeneous over distances of 70 km or more. Calcite and montmorillonite cements from the Arikaree Group (Oligocene-Miocene) have an $^{87}Sr/^{86}Sr$ ratio of 0.7103, whereas calcite and clinoptilolite from the Ogallala Group (Miocene-Pliocene) yield 0.7112. The ratio of the cements suggests that the pore waters were homogeneous on a regional basis and were not locally controlled. The slight difference in the isotopic composition of strontium in the cements of the Arikaree and Ogallala Groups may have resulted either from decay of ^{87}Rb during the time interval of about 20 m.y. between lithogenesis of the Arikaree and Ogallala Groups or from differences in their mineral compositions. A quantitative model for mixing of different isotopic varieties of strontium indicates that Precambrian plagioclase, Paleozoic marine carbonate rocks, and Tertiary volcanic ash were the dominant sources of strontium in the pore solution and that Precambrian K-feldspar was the principal contributor of radiogenic ^{87}Sr.

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Estuarine–Coastal Plain Coal Deposition in Southern West Virginia; Pennsylvanian Beckley Seam

Current studies of the Beckley (Pennsylvanian) seam in an area 60 by 30 km in southern West Virginia indicate that the Beckley was formed in a back-barrier depositional setting. Examination of about 1,800 core records as well as underground workings shows that the Beckley stratigraphic position is characterized by linear northeast-southwest-trending orthoquartzitic sandstone bodies about 1,500 m wide representing stranded barriers on a prograding coastal plain. Areas between the barrier sandstones are about 15 km wide and are occupied by coal and shale of estuarine and tidal-creek origin. The thick bodies of coal, which are relatively small (4.8 by 9.6 km or less), are located on the flanks of the barrier and thin toward the shaly central part of the interbarrier area. Adjacent to the barriers, the coal is split by small linear tongues of sandstone produced by erosion of the barrier. Where the coal adjoins estuarine and tidal-creek sediments, it interfingers and thins into shale and sandy shale. Within the interbarrier areas, the thickest coal is near the headward parts of the tidal creeks; closer to the major estuary the coal bodies are thinner and smaller in areal extent. Knowledge gained from exploration and mining of the Beckley seam should aid in searching for and developing coals in similar depositional settings.

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Geochemical Evaluation of Ensenada de la Vela Basin, Offshore Falcon State, Venezuela

Maturation mapping in the Tertiary La Vela basin, based on bottom-hole temperatures of 12 wells, indicates that only the Paleogene Guarabal Formation and the lowermost part of the Miocene Agua Clara Formation reached temperatures adequate for the generation of oil.

Plotting of temperature contours on cross sections of the basin and on isopach maps delimited the extent of the potential oil-forming units. Flows of oil in drill-stem tests came from wells on a basement horst adjacent to a deeply buried "pod" of Guarabal Formation, which was suggested as the local source rock.

Later geochemical analyses of samples from three wells confirmed this model by showing that the Miocene Agua Clara Formation was immature and contained insufficient amounts of organic matter to be an oil source. Furthermore, it was confirmed that the "pod" of Paleogene Guarabal Formation was mature, and contained up to 6% total organic carbon as well as predominantly oil-prone kerogen.

Accurate location of the oil-generating beds in the La Vela basin was thus made possible by geochemical mapping, and should help focus exploratory drilling on those traps most likely to contain oil accumulations.

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Carbonate Geology of Peña Blanca Uranium District, Chihuahua, Mexico

The Peña Blanca Range of central Chihuahua is the site of Mexico's largest uranium deposit. The exposure at Peña Blanca consists of Tertiary silicic pyroclastics overlying middle Cretaceous (Albian and Cenomanian) limestones. The uranium is present predominantly in the basal unit of the pyroclastics, at or near the contact with the limestones. The limestones make up a large