shore conditions of reduced salinity and belongs to the *Cavusgnathus*-biofacies.

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WIDE-LINE PROFILING

A technique developed and perfected in France by Compagnie Generale de Geophysique makes it possible to record, process, and interpet reflected events originating from every direction.

The field layout is the same as that for conventional, multiple-coverage, seismic-reflection profiling. The only difference is that shot points are placed along oblique lines, so as to obtain several parallel, regularly spaced, depth-point lines. After processing, these lines yield comparable, although not identical, seismic sections, and a computer is able to analyze, by the cross correlation process, the slight shift of reflection events caused by lateral gradients.

A complete software was developed and the longitudinal dips, lateral dips, total dips, migration offsets, and time corrections are produced by a Calcomp plotter. The basic document is a section obtained by stacking the individual parallel sections after removing events which do not correlate laterally. The Calcomp displays provide the necessary parameters for migrating all events in three dimensions.

Considerable improvement over old methods was provided in tectonically complex areas. In other cases, an apparent unconformity resulted from 2 lateral events of opposite dips, a reflection on a fault plane beyond the seismic line was identified, and good results were obtained using lateral dip criteria in an area where high multiplication had been unsuccessful.

The advantage of wide-line profiling is that it expands the multiplication in lateral directions at a small cost increase. The software developed by CGG sorts out the seismic arrivals and provides tools for migration in a true three dimensional space.

The wide-line profiling technique has now reached the industrial stage and was used successfully in areas with complex structural geology, such as Spain, France, Italy, Libya, Angola, and Canada.

MILLER, E. B.

OIL INDUSTRY VIEWPOINT

No abstract available.

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SILURIAN CONODONTS FROM DEATH VALLEY, CALIFORNIA

The northern part of the Panamint Range, Inyo County, California, contains many early and middle Paleozoic marine formations, but precise stratigraphic relations are poorly known for lack of abundant megafossils and because of postdepositional dolomitization and silicification of the rocks.

The type section of the Hidden Valley Dolomite consists of 1,365 ft of light- to dark-gray, chert-bearing dolomite. On the basis of megafossil evidence, previous workers considered that the major part was Silurian and the upper 65 ft was Early Devonian.

Approximately 1,000 conodonts were identified from samples collected in a measured section about 1.5 mi north of the type section. Specimens from the uppermost 50 ft of the underlying Ely Springs Dolomite indicate a Late Ordovician or Early Silurian age. Conodonts from the Hidden Valley Dolomite indicate the presence of the European and eastern North American *Neospathogathodus celloni* zone and the younger *Pterospathodus amorphognathoides* zone within the lower 325 ft of the formation. Both zones are of Llandovery age (C_2- C_6) and represent the first report of Early Silurian conodont zones from the Death Valley area. The middle part of the formation yielded no conodonts, but a sparse fauna about 150 ft below the upper boundary contains specimens *Polygnathus linguiformis* and *Icriodus latericrescens*, suggesting an Early Devonian age. No diagnostic Devonian conodonts were recovered from the lower 100 ft of the overlying Lost Burro Formation.

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TECTONIC AND STRATIGRAPHIC EVIDENCE FOR MIOCENE GULF OF CALIFORNIA

The correlation of clasts in Eocene river gravels in Baja California with the sources for the clasts in Sonora has indicated the necessity for the dilation of the northern Gulf of California depression prior to, or concurrent with, the 23-18 m.y. opening of the Basin Range province in Sonora. The appearance of an extensive, basin-filling seaway in Baja California and Sonora during the Miocene is consistent with a regional subsidence resulting from crustal extension. The presence of shelf-type lower Miocene marine sediments on both coasts of Baja California Sur, between Loreto and La Paz, suggests that the marine waters entered the early Gulf across a shallow, nontectonic seaway which opened to the Pacific Ocean.

The recognition of the early Miocene seaway extending into the northern Gulf, coupled with a later (4-10 m.y.) opening of the modern Gulf, supports the idea of a Gulf formed in at least 2 tectonic stages.

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GEOLOGIC EVOLUTION OF NORTH-NORTHEAST CONTINENTAL MARGIN OF BRAZIL

The Brazilian north-northeast continental shelf, between 35° and 47° west, is composed of the offshore Barreirinhas, Piaui, Ceará and Potiguar basins. The total area within the 200-m bathymetric contour, excluding the shallow basement area, encompasses approximately 51,000 sq km. The sedimentary sections of these basins can be subdivided in several genetic sequences of strata, which by comparison, from older to younger, show the tectosedimentary and paleogeographic evolution of the area.

The Equatorial Atlantic rift (which probably started in Eo-Cretaceous time) had its great development in Aptian time. From the beginning of the rift opening to the end of Albian time, all the coastal basins were of the semigraben type tilted to the south. From Cenomanian to Santonian time, these basins gradually evolved into northward-opening marginal-type basins. At the end of this period, the final separation of South America and Africa took place, developing a north-south compressional stress in the fracture zones. As a result, folding, reverse faulting, transcurrent faulting, and grabens developed. From Campanian to Holocene, these coastal basins maintained their northward-open, marginal-basin characteristics.

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SEDIMENTARY AND TECTONIC HISTORY OF CRETACEOUS FLYSCH IN SOUTHWESTERN ALASKA

Cretaceous deep-water sedimentary rocks are discontinuously exposed or have been dredged, along 1,700 km of the outer continental margin of the Alaska Peninsula-Bering Sea shelf. In the Shumagin and Sanak Islands, on the continental shelf near the southwestern end of the Alaska Peninsula, the deep-sea sediments are comprised of monotonous sections of thin (4 cm) to thick (10 m) bedded sandstone and mudstone, showing grading, convolute lamination, groove and flute casts. The sandstone beds are lithic arenite with more than 40% volcanic-derived framework grains. Over 500 measurements of sole marking in the Shumagin and Sanak Islands show maxima