tle open folds in shallow Neogene bed rock, likely to be crustally pervasive, are draped over the indicated fault zone. Lengths of major fold axes range from 25 to 45 km, with dips on fold limbs ranging from 2 to 11°. Wavelength of folds averages 3 km with indicated shortening at the pre-Pleistocene unconformity of 1.5 to 2.5%. The curvilinear trend of fold axes and associated minor faults is oblique to the Sandspit trend. Lack of a through-going fault in Neogene sediment cover demonstrates that the zone is in an early or incipient stage of wrench-related structural development. Deep coupling movements along the buried fault zone are interpreted as the drive which has produced the observed shallow structural pattern.

Temporal and spatial relations of the major northwest shears suggest part of the North American–Pacific plate motion has been taken up by the Sandspit and Rennel-Louscoone faults. Earlier lateral movements along major faults in Queen Charlotte Sound, that may form part of a further Sandspit extension, might explain geophysical anomalies and tectonic events recorded in Insular Belt rocks.

Exploratory drilling in the late 1960s tested a number of wrench anticlines along a broad zone parallel to the offshore Sandspit fault trend.

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Lower Cretaceous (Neocomian) Sedimentation of Sable Island Area, Scotian Shelf, Eastern Canada

Neocomian sedimentation in the Sable Island area, Scotian Shelf, eastern Canada, has been studied by analysis, of 13 offshore wells, using log analysis binocular and petrographic microscope examination of cutting-samples and cores, and stratigraphic map analysis.

The Neocomian is represented in the study area by the Missisauga Formation, a dominantly sandstone sequence containing thick sand units with minor limestone and shale interbeds in the central part of the Scotian basin. The Neocomian sandstones are texturally immature to supermature, and range from subarkose to volcanic sublitharenite with rare quartzarenite. Limestones include both sparry and micritic types. Shales are mostly carbonaceous, pyritic, and silty.

During the early Berriasian, coarse clastics were introduced to the study area from the north and northwest, and gradually built up a high-constructive, lobate-type delta. The source area included granite, acidic to intermediate volcanic rocks, and sedimentary and possibly some metasedimentary rocks. A regional transgression at the end of Neocomian terminated the delta.

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Importance of Resolution for Helium Detectors Used in Uranium Exploration

One aspect of the Department of Energy's National Uranium Resource Evaluation (NURE) program sponsored through Bendix Field Engineering Corp. involves evaluation of instrumentation used for uranium exploration. In recent years ^4He has been useful in exploring for both uranium ore and petroleum deposits. As a consequence, mass spectrometers (leak detector type) have been used to seek small (a few percent) variations of ^4He in soil gases and aquifers. We modified one of these instruments to ascertain its reliability regarding resolution (the ability to separate adjacent mass peaks). We used the Veeco MS 17 AB because it provides twice the resolution of comparable instruments. An electromagnet was substituted for one of the permanent magnets to enable scanning the 0 to 5 amu mass range.

Acquired spectra allowed the determination of the contribution to mass three ($HD + H_3 + {}^3He$) from mass two (H_2). Interference is significant at the 1% level (the size of helium anomalies usually sought) when the abundance ratio $(M = 2)/(M = 3) \geq 75$. This value is valid for the $H_2/{}^4He$ ratio for an equivalent system with 50% lower resolution.

Additional experiments identified dissociated water or hydrocarbons as the principal source of H_2. Correlations of ^4He with soil gas moisture found in prior studies may not be due to true variation in ^4He but are ascribable to artifacts resulting from H_2 contributions to ^4He. Corrections for such artifacts can be made by converting field instruments to a scanning mode.

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Mesozoic and Cenozoic Paleogeography

A series of reconstructions showing land-sea relations, sedimentary facies, and volcanic types has been drawn. Continental orientations were determined using paleomagnetic, climatic, biogeographic, and sea-floor anomaly data. The main differences between these and existing maps are seen in south Asia. Here, Late Triassic sutures, involving Indochina, South China, and North China, indicate that Pangea did not form until this time. Paleoclimatic indicators associated with these south Asian blocks would place them in the tropics in the Triassic rather than the temperate zone as suggested by most published maps. Another innovation in the maps is the palinspastic restoration of the zone between India and the Tarim basin. Published paleogeographic maps show a 1,500 km-wide ocean between Indian and Asia in the late Eocene, the time that lithofacies and biogeographic data indicate that they were in contact. Present crustal thicknesses across the Himalayas and the Tibetan Plateau are double the norm, and so by "unthrusting" the Himalayas, and "unfolding" Tibet, we have constructed a series of maps that show the Asian blocks in contact at the appropriate times. All of the above changes result in an areally restricted Tethyan seaway. The effect of crustal foreshortening in the Tertiary may help to explain the extreme lowering of sea level during this time. The telescoping of continental crust would result in wider ocean basins at the present than at any time since the end of the Permian. This would have the effect of draining the epeiric seas.

1981 AAPG Student Chapter Program Abstracts

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Estimate of Volcanic Production Rate for Galapagos Islands, Ecuador

The Galapagos Islands, located midway between the East Pacific Rise and the South American continent, constitute one of the most volcanically active regions of the world. Satellite imagery, aerial photographs, and previous land surveys were used to estimate the volume of material produced from the