mitted in the near future to meet the demands of the nuclear power industry.

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RESOURCE SIGNIFICANCE OF URANIUM DEPOSITS IN FLUVIOCLASTIC ROCKS IN TERTIARY VOLCANIC TERRANES

Projections of future demand for nuclear-powered electrical generating capacity indicate that a large amount of uranium will be needed by the year 2000. Uranium deposits of the type found in the Colorado Plateau region and in Tertiary basins in Wyoming have been the principal source of uranium in the United States, and potential resources in such deposits are large. Even so, they may not be fully adequate to supply all the uranium needed. For this reason, attention is focused here on a variant type of deposit that so far has not yielded much uranium, but that may have a significant potential because the deposits are widely distributed in a geologic setting that is extensive in western United States.

The deposits, like the better known Colorado Plateau and Wyoming deposits, consist of uranium minerals interstitial in continental sandstone and conglomerate that also contain carbonized plant remains. The deposits are in lenticular beds within sequences of Tertiary volcanic rocks, mostly at or near the base of a sequence. The sedimentary lenses containing mineralized rock are irregular, probably because their form and distribution were controlled in part by underlying pre-volcanic topography and in part by drainage changes on an unstable volcanic terrane.

If geologic ingenuity can discern the irregular pattern of the host lenses under a cover of volcanic rocks and establish the relation of deposits to the pattern, new uranium resources might be the reward.

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ISOTOPE GEOCHEMISTRY OF MODERN ARID SUPRATIDAL (SABKHA) EVAPORITE ENVIRONMENT, ABU DHABI, TRUCIAL COAST

Considerable data exist on the isotopic composition of ancient sedimentary sulfates. Interpretation of these data has been hampered by the absence of a base line for comparison from a modern evaporite environment.

Isotopic analyses (258 total determinations) of pore brines [$\delta O^{18}(H_2O)$, $\delta S^{34}(SO_4^{=})$] and coexisting diagenetic gypsum and anhydrite [$\delta S^{34}(SO_4^{=})$] in the Abu Dhabi sabkha indicate: (1) that the regional distribution of δO^{18} and δS^{34} in brines reflect the climatic regime and possible favorable fractionation of O^{18} into H_2O of precipitated gypsum (δO^{18}); (2) that the source (marine versus continental) of fluid input into the sabkha is reflected in the brine δO^{18} and δS^{34} values; (3) that δS^{34} in diagenetic sulfate minerals reflects the favorable fractionation of S^{34} into the precipitating sulfates from pore fluids and (4) δS^{34} values of anhydrites permit the identification of anhydrites formed under a marine versus continental-derived fluid regime.

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PLASTIC DEFORMATION THEORY OF OIL ACCUMULATION

Scientifically accepted geologic ideas have never explained certain types of oil accumulations, some of which are functions of subsurface plastic deformity that can vary with overburden. Plastic deformity is a reservoir property which when acknowledged and understood, helps explain the positions of known oil pools and conversely facilitates the bracketing of new deposits. A knowledge of plastic reservoir deformity resolves some annoying mysteries concerning well fracing, drill-stem test results, and very deep reservoir producing behavior.

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NEWBURG OF WEST VIRGINIA

The Newburg (subsurface equivalent to the Williamsport Sandstone of Late Silurian age) has been the most important pre-Middle Devonian drilling target in West Virginia for several years. Seven gas fields have been discovered, covering an area of about 110 sq mi. Two wells have produced commercial quantities of Pennsylvania grade crude oil. As of November 1, 1970, the fields had produced an estimated 150 billion cu ft of gas. The median producing depth is approximately 5,500 ft.

Trapping is both structural and stratigraphic, but predominantly controlled by porosity. Reported thicknesses of Newburg range from 0 to more than 25 ft but few wells have effective sandstone thicknesses in excess of 15 ft. Porosity values of 20% or more have been reported, but few sandstone beds with porosity of 8% or more are thicker than 10 ft. Permeability values in the more productive areas range up to more than 200 md.

Fields are located in the western third of the state, and the best possibilities for future production lie in the undrilled parts of this division. Second best prospects lie within the middle third of the state which has been sparsely drilled to sufficient depth, and where two Newburg gas shows have been reported. Possibilities for the eastern highly folded belt are problematical.

Some of the early wells were acidized, but now it is almost standard practice to fracture them; usually with very beneficial results. A few wells have been completed without stimulation.

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SURFICIAL SEDIMENTS OF BARKLEY SOUND AND ADJACENT CONTINENTAL SHELF, VANCOUVER ISLAND, BRITISH COLUMBIA

The bathymetry of Barkley Sound and the adjacent continental shelf off Vancouver Island, has been affected by glacial erosion. Several fiords widen and coalesce to form the sound, which is continuous with glacially eroded basins on the inner continental shelf. Basins are flanked by flat-topped banks, the larger of which merge with the gently sloping outer shelf which terminates at the 200-m isobath, some 58 km from shore.

Studies of surficial sediments for size, color, mineralogy, organic carbon, $CaCO_3$, and fauna, led to recognition of 5 sediment types: (1) modern sediments, at present accumulating in Barkley Sound, are littoral sands and gravels, and deeper water organic-rich muds; (2) relict sands and well-rounded gravels mantle banks and parts of the outer continental shelf; (3) authigenic sands composed of mixed-mineral "glauconite" pellets are present near the shelf break, where they are closely associated with (4) residual sediments derived from submarine exposures of Tertiary mudstone; (5) organic sediments, composed of calcareous invertebrate