basin while Ordovician carbonates and shales form potential fields throughout parts of the southern Canning basin. Thick sequences of interbedded clastics and marine rocks of Silurian to Permian age form additional targets in several depocenters in the Canning. Oil reservoirs of Ordovician age occur in the western Amadeus basin but new plays exist in the basal Cambrian sands of the eastern Amadeus and potentially in the northern thrust sheet belt. Oil has now been found in rocks of Permian, Triassic, Jurassic, and Cretaceous age in the Cooper-Eromanga basin. New plays exist with the extensions of the central Eromanga basin where higher heat flow and deeper burial has matured younger Jurassic sources. The more established Surat basin has further potential in Permian and Triassic rocks as does the Mesozoic in the coastal Clarence-Moreton and Sydney basins. With less than 200 wildcats being drilled every year, the potential for this corridor certainly lies in the future.

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A Uraniferous Granite in Central Texas

The Precambrian Oatman Creek granite exposed in Gillespie County, central Texas, contains 5 to 10 times more uranium than that of an average granite. Samples of this granite, collected from outcrops and quarry openings, were studied by petrographic, delayed neutron counting, fission track, and gamma-ray spectrometry methods. Experiments of leaching uranium from disaggregated samples were also made.

The granite is medium grained with an average composition of 36% quartz, 25% K-feldspar, 38% plagioclase, and 1% biotite and others. In an 80-acre (32 ha.) outcrop area 32 samples, most of which have some uranium removed from weathering, show an average uranium content of 25 ppm; relatively unweathered samples have 50 to 100 ppm uranium. Most uranium occurs between grain boundaries which is called intergranular uranium; some occurs in microfractures developed during late, hydrothermal stages. A portion of the uranium also occurs in discrete minerals, particularly oxides of iron or iron-titanium, and accessory minerals such as zircon, sphene, garnet, and others. This distribution indicates that much of the uranium mineralization was a result of deuteric or hydrothermal activities.

Selected acids of various concentrations were used in experimental leaching of uranium from Oatman Creek granite. Other variables in the experiments were degree of disaggregation and duration of leaching. The results indicate that more than two thirds of the uranium can be leached in a few hours time from the granite without excessive grinding, when a 5N acid is used.

This study shows that the Oatman Creek granite may be a long-term source of uranium in the future.

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Thermal Maturation Model of Late Proterozoic-Paleozoic Amadeus Basin, Central Australia

The thermal maturation of the Amadeus basin, central Australia, was modeled using a modified version of Lopatin's time-temperature index. The late Proterozoic-Paleozoic basin presented numerous difficulties: (1) the absence of vitrinite in pre-Silurian strata (about 75% of the total section), (2) two major orogenic events that markedly deformed the basin, (3) moderate to extreme (25,000 ft, 7,620 m) amounts of surface erosion since the Carboniferous, and (4) a paucity of data (27 wells in an area equal in size to Oklahoma). The presence of possible giant oil and gas fields (from Ordovician shales as source) and significant gas discoveries in Proterozoic rocks made the study of special interest.

Assuming a constant geothermal gradient of 1.65°F/100 ft to be representative of the basin, the amount of surface erosion was found to be the most significant factor controlling distribution of thermal facies. Interval-transit times in shales and palinspastic reconstructions of sedimentary thicknesses were used to estimate amounts of surface erosion and missing section associated with unconformities. An estimated 25,000 ft (7,620 m) of section has been removed along the northern margin of the basin, with approximately 8,000 to 9,000 ft (2,438 to 2.743 m) absent in the vicinity of the major oil and gas fields. Surficial erosion in both areas is the result of uplift associated with the Alice Springs orogeny.

The Amadeus basin is an excellent example of a generation/migration/accumulation system favorable for commercial reserves of petroleum. The formation and accentuation of large anticlinal traps in Cambro-Ordovician sandstones slightly predated deep burial and strong oil generation in the Lower Ordovician Horn Valley Siltstone (Early to Late Carboniferous). The late Proterozoic Bitter Springs Formation, another possible source, was generative in the late Proterozoic to Early Ordovician. Suitable traps were also extant at this time.

The thermal history of the Amadeus also demonstrates that maturation essentially halts if burial temperatures are substantially decreased by erosional unloading. In this manner sediments may remain deeply buried for long periods without undergoing substantial thermal alteration.

The Amadeus is a very "mature" basin, with 47% of the strata being overmature (prospective for gas only). Hydrocarbon liquids are most likely preserved in the north-central part of the basin, as shown on a depth to liquid-limits map.

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Aspects of Silurian Clinton Sandstone Development in Ohio More Conducive to Oil and Gas Production

The drilling of 2,000 to 3,000 development wells a year for several years into the Clinton Sandstone reservoir in eastern Ohio has provided a data base for distinguishing a number of deltaic sedimentary patterns that are more productive of oil and gas than others. Clinton Sandstone development drilling in Ohio, Penn-