occurring in NPRA. Thus a paleoshoreline is probably located somewhat north of the measured sections.

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Effects of a Finite Length Rifting Event on Development of Sedimentary Basins and Continental Margins

Most thermo-mechanical models for the development of sedimentary basins and continental margins assume that the rifting responsible for the formation of the basin occurred instantaneously and that the post-rift development of the basin has been examined. We have examined the effects of a finite rifting time on the development of sedimentary basins using an analytic technique which allows an arbitrary rifting history in both time and space and which considers the effects of both horizontal and vertical heat transfer. We are able to calculate the thermal structure of the lithosphere throughout the rifting event and thus trace the history of the surface heat flow and uplift/subsidence over the developing basin.

Lateral heat flow, which was not included in previous studies of the effects of finite rifting times, has a very significant effect on the subsidence history, distribution of sediments, and temperature history. In particular, for a rifting event as short as 10 m.y., the post-rift subsidence is increased by as much as 20%. This will significantly decrease the subsidence rates in the post-rift stage and implies that inferences concerning the structure, development, and thermal history of the basin derived from simply fitting "β-curves" to the backstripped subsidence can be grossly in error.

In addition, the lateral heat flow will effect the stratigraphy along the margin of the basin. The timing and extent of onlap sequences around the edges of the basin due to flexure are greatly influenced by the length of the rifting event, as is the width of the coastal plain along a rifted continental margin.

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Stratigraphy and Depositional Environments of Vicksburgian Oligocene of Northern Gulf Coastal Plain

The Vicksburg Group (Oligocene) is a predominantly carbonate unit that extends in a narrow belt from Rosefield, Louisiana, to western Florida. East of the LaSalle arch (eastern Louisiana) the carbonates of the Vicksburg Group are continental shelf in origin and display a sedimentary strike of approximately east-west.

The carbonate formations of the Vicksburg Group are demonstrated to be facies of one another and to constitute a single sedimentary cycle. The outcrop belt strikes west-northwest across the sedimentary strike displaying changes in the lithofacies of the group.

The formational division of the Vicksburg Group established by Cooke in 1918 and others is clarified, and the scope of the Byram and Glendon Formations is revised to conform to the lithofacies of their types localities. The Byram Formation is redefined to include the silty sands and wackestones of a regressive carbonate shelf/destructional bank facies. The Glendon Formation is restricted to include only the skeletal grainstones and coarse sands of a carbonate shoal/shoreline. The Marianna Formation includes mudstones of an algal mud shelf bottom and silty sands of a back-bank facies. The Mint Spring Formation consists of silty sands of a destructional delta environment and includes those glauconite sands that overlie the prodelta clays of the Forest Hill Formation. The Rosefield Formation is probably a chenier plain silty clay with a coquina beach zone of fossils common to the Byram Formation.

Penecontemporaneous or post-Vicksburg erosion on the crest of the Wiggins uplift apparently restricted or removed possible Vicksburgian coral-algal reef or nummulitic bank sediments. Limited subsurface data show that a nummulitic bank did develop on the north flank of the uplift. This bank migrated northward as the Marianna back-bank area shoaled and produced the *Nummulites-Lepidocyclina* grainstone/sand of the Glendon Formation at its type locality.

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Systematics and Paleoecology of Silicified Gastropoda of Tonoloway Formation (Upper Silurian) at Pinto, Maryland

The silicified gastropod fauna from the excellent Tonoloway reference section at Pinto in western Maryland has been studied by means of specimens obtained by etching bulk samples in hydrochloric acid. Of the four published gastropod taxa from this locality, three are placed in synonymy and one, based on an indeterminate internal mold, is restricted to its type. In addition to the aforementioned taxa, a new genus and species of Bellerophontacea in the subfamily Carinaropsinae and two species of Holopeid gastropods were recovered and described. Sedimentary and petrographic data suggest a low-intertidal to shallow-subtidal, soft-bottom, carbonate substrate environment for the gastropod-bearing beds sampled. This interpretation is supported by data from several studies of the paleoecology of Paleozoic gastropods which are systematically related and morphologically similar to the taxa recovered in this study.

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Potential Oil Corridor Bisects Australian Continent

New oil discoveries, coupled with intensified exploration in the past four years, suggest that several of Australia's major onshore basins can be linked to form a potential oil corridor which will span the continent. The huge Canning basin forms the western part of the corridor and lies adjacent to fields in the Amadeus and Pedirka basins in central Australia which merge with the oil provinces of the central Eromanga and Cooper basins which are linked, in turn, to the eastern Surat basin. Some narrow basement arches separate and form the only barriers to a zone which crosses the Great Inland deserts of the continent. Eventually this zone could support a network of pipelines and other facilities to provide the infrastructure required for easier economic development of remote outback regions. Parts of the infrastructure are now being developed or already exist such as the pipelines from Moomba to Sydney and Adelaide. As new oil discoveries, such as those at Blina in the Canning basin and in Jackson in the Eromanga basin, are made, this infrastructure will grow along the potential corridor and away from it to coastal waters. The corridor owes its origin in the main part to the geometry of ancient basic tectonics and subsequent sedimentation patterns. For instance, Ordovician oil-rich sequences linked the Canning and Amadeus basins, whereas Jurassic oil reservoirs cross the remainder of the eastern half of the corridor. Potential new discoveries are predicted for sequences which range in age from upper Proterozic to Neocomian and these can be reviewed within the corridor. Devonian reef trends flank the northern Canning

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-