widely scattered, nondescript small deposit-feeder trace fossils. The Nugget, however, is distinguished by distinctive traces, which hold promise for environmental interpretation. Vertical and horizontal light-colored sand-filled tubes averaging about 0.7 to 1.0 cm diameter are abundant in one or more relatively thin zones in practically all exposed sections in the western Uinta Mountains and Wyoming-Idaho thrust belt. Well-preserved examples show delicate spreiten, which seem to necessitate moist, if not saturated, sand. Some Nugget traces occur in planar-bedded units that might have been subaqueously deposited, but they also occur in medium-scale to large-scale cross-bedded units with eolian lamination. The apparent restriction of this distinctive trace to the western part of the Nugget, which has been suggested to be at least partly marine, seems environmentally significant. Apparently the trace-making organism required moisture, but was capable of burrowing into dry or nearly dry (moist) dunes.

Although no modern burrowing analog can be designated confidently, the burrows of scarab beetles recognized by G. W. Hill on Padre Island are very similar. There the beetles burrow from moist interdunes into dry dunes.

## AAPG SOUTHWEST SECTION MEETING
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### Abstracts of Papers

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#### Turbidite Channel Reservoirs in Canyon Sandstone, Roundtop Area, Fisher County, Texas

Thin sandstones in the Canyon Group produce oil from stratigraphic traps in the Roundtop area, Fisher County, Texas. Cores from Tolar Canyon field show that the sandstones are turbidites of channel and overbank origin. Channel sandstones are composites of stacked AE and ABE turbidite sequences. Overbank sandstones represent more complete sequences of the ABCE and ACE types. Interbedded sections of basinal shale contain thin ripple lenses of sandstones representing CE sequences.

The sandstones are fine grained (0.18 mm) and consist of 72% quartz, 2% feldspar, 19% rock fragments, and 6% clay matrix. Cement is present in a total amount of 11% and is mostly calcite with some silica overgrowths. Thicker channel sandstones have the best average permeability, about 12 md, and thinner channels have lower permeabilities of 2 to 4 md, whereas rippled sandstones have very low permeability because of clay matrix and interbedded shale.

Massive channel sandstones are closely bounded laterally by thinly bedded levee deposits which change abruptly to basinal shale. Channel reservoirs are 10 to 30 ft (3 to 10 m) thick, only about 500 ft (150 m) wide, and form narrow, sinuous, dip-trending bodies at several stratigraphic levels within the Canyon interval of about 300 ft (92 m). The abrupt lateral change from channel to overbank and then to basinal deposits suggests that channels were of the "constructional" type and composed of successive flow units, each of which consisted of contemporaneous channel-fill and levee facies.

This depositional system is distinctly different from submarine-fan deposits which are also composed of channel and overbank sediments but form thicker, composite sandstone bodies of greater areal extent and broadly lobate morphology. In contrast, the "constructional" channel sandstones are thin units isolated in a dominant basin-shale sequence. Recognition of these reservoir types may be important in exploration and field development in other turbidite sections.

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#### Depositional Models and Resource Potential of Pennsylvanian System, Palo Duro Basin, Panhandle Texas

The Palo Duro basin of the Texas Panhandle is a relatively sparsely drilled interior basin. Sediments of Pennsylvanian age were deposited in a variety of clastic and carbonate environments. From 0 to 2,400 ft (0 to 732 m) of sediment was deposited with greatest accumulation along a northwest- to southeast-trending basin axis.

Erosion of Precambrian basement in the Amarillo and Sierra Grande uplifts supplied arkosic sand and gravel to alluvial fans and fan deltas along the northern margin of the basin. Distal-fan sandstones are interbedded with thin shelf limestones, and basinward of clastic deposition, shallow-shelf limestone was deposited across most of the Palo Duro basin. Basinal shales were deposited only in a small area just north of the Matador arch.

Increased subsidence deepened and enlarged the basin throughout the Late Pennsylvanian. Ultimately, the basin axis trended east-west with a narrow northwest extension. A carbonate-shelf-margin complex with 200 to 400 ft (70 to 120 m) of depositional relief developed. High-constructive elongate deltas prograded into the Palo Duro basin from the east in the Late Pennsylvanian. Prodelta mud and sands entered the basin through breaks in the carbonate-shelf margin.

Porous dolomitized limestone is present in belts 10 to 20 mi (16 to 32 km) wide along the shelf edge. Potential hydrocarbon reservoirs are the dolomitized limestone, fan-delta sandstones, and deltaic bar-finger sandstones. However, the thermal history of the basin may not have allowed hydrocarbons to mature or migrate into reservoir facies.

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#### Atoka Gas in Southern Cottle and Northern King Counties, Texas

The 330-sq-mi (855 sq km) area includes nine gas fields on the flanks of the pre-Pennsylvanian northwest-southeast feature known as the "Masterson arch." This arch originates on the Masterson Ranch in the extreme western part of the Baylor basin near the Knox and King county line and becomes progressively deeper as it continues to the northwest through the Juniper A and