

ABSTRACTS

THE DISTRIBUTION OF TRACE FOSSILS IN THE UPPER PART OF THE MORRISON FORMATION AND THE DAKOTA FORMATION IN PART OF THE SOUTHEASTERN SAN JUAN BASIN, NEW MEXICO

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In the southeastern part of the San Juan Basin (north-central New Mexico), the upper Morrison, Dakota and lower Mancos stratigraphic interval represents a transgressive non-marine to marine sedimentary sequence. A preliminary investigation has shown that trace fossils, although quite sparse in the non-marine sediments of the upper Morrison, are common in the marginal-marine deposits of the lower Dakota and are extremely abundant and taxonomically diverse in the nearshore marine lithofacies of the upper Dakota and lower Mancos. The distribution of most trace fossils reflects strong control by substrate and environmental facies; however, several taxonomic and ethological variants of a few ichnogenera demonstrate a lack of such control.

Observations were made in five measured sections located along the Dakota outcrop belt within a 5 to 10 mile radius extending from southwest to northwest of San Ysidro, New Mexico. These sections were subdivided into several sandstone and shale units. Trace fossils observed within the sandstone units are listed in the table below. The Dakota-lower Mancos Sandstone Units labeled Lower, Middle, and Upper Sandstones appear to be comparable, respectively to the lower part of the Oak Canyon Member, the Cubero Sandstone Tongue, and the Paquete Sandstone Tongue of the Dakota Formation (Landis, Dane and Cobban, 1973, this volume).

The "Jackpile Sandstone" of the upper part of the

Morrison Formation contains only a few trace fossil structures, many of these can be ascribed to the ichnogenus *Planolites*, the only trace fossil type occurring in all stratigraphic units investigated in this study. The paludal and strand-line deposits of the lower Dakota contain abundant *Skolithos* and *Planolites*, and *Ophiomorpha*, which displays transition in form to a small variety of *Thalassinoides*. "Reed(?) Molds" are also common in the lower Dakota sandstones.

Shallow-water marine sandstones of the upper Dakota are intertongued with the lower Mancos shales and are characterized by an abundance of trace fossils. Well-developed *Ophiomorpha* and *Teichichnus* structures each show transition in form to a small variety of *Thalassinoides* and are probably ecovariant forms made by the same organism. Additional ichnogenera studied include large polygonal *Thalassinoides*, large bulbous bedding surface *Asterosoma*, *Arenicolites*, well developed *Zoophycos*, *Chondrites*, *Planolites*, *Skolithos*, and several bedding plane trails, including *Crossopodia*, *Gyrochorte*, and *Pelecypodichnus*. The presence of *Zoophycos* is of particular interest because of its usual association with "deep-water" deposits. The large *Thalassinoides* and *Asterosoma* structures appear to be restricted to the "deeper" water sandstone deposits of the upper Dakota.

BIOGENIC SEDIMENTARY STRUCTURES	STRATIGRAPHIC UNITS			
	Morrison Fm.	Dakota — lower Mancos Interval		
	"Jackpile Ss"	"Lower Ss"	"Middle Ss"	"Upper Ss"
"Reed Molds"		X		
<i>Skolithos</i>		X	X	
<i>Planolites</i>	X	X*	X	X
<i>Ophiomorpha</i> — small				
<i>Thalassinoides</i>		X	X	X
<i>Teichichnus</i> — small			X	
<i>Thalassinoides</i>				X
Large <i>Thalassinoides</i>				X
<i>Asterosoma</i>			X	X
<i>Arenicolites</i>			X	
<i>Zoophycos</i>			X	X
<i>Chondrites</i>			X	X
<i>Crossopodia</i>			X	X
<i>Gyrochorte</i>			X	X
<i>Isopodichnus</i>				X