

POLLEN, SPORES AND THE DALTON COAL (UPPER PENNSYLVANIAN) OF NORTHERN TEXAS

Judith A. Gennett¹, Robert L. Ravn², and Anne Raymond¹

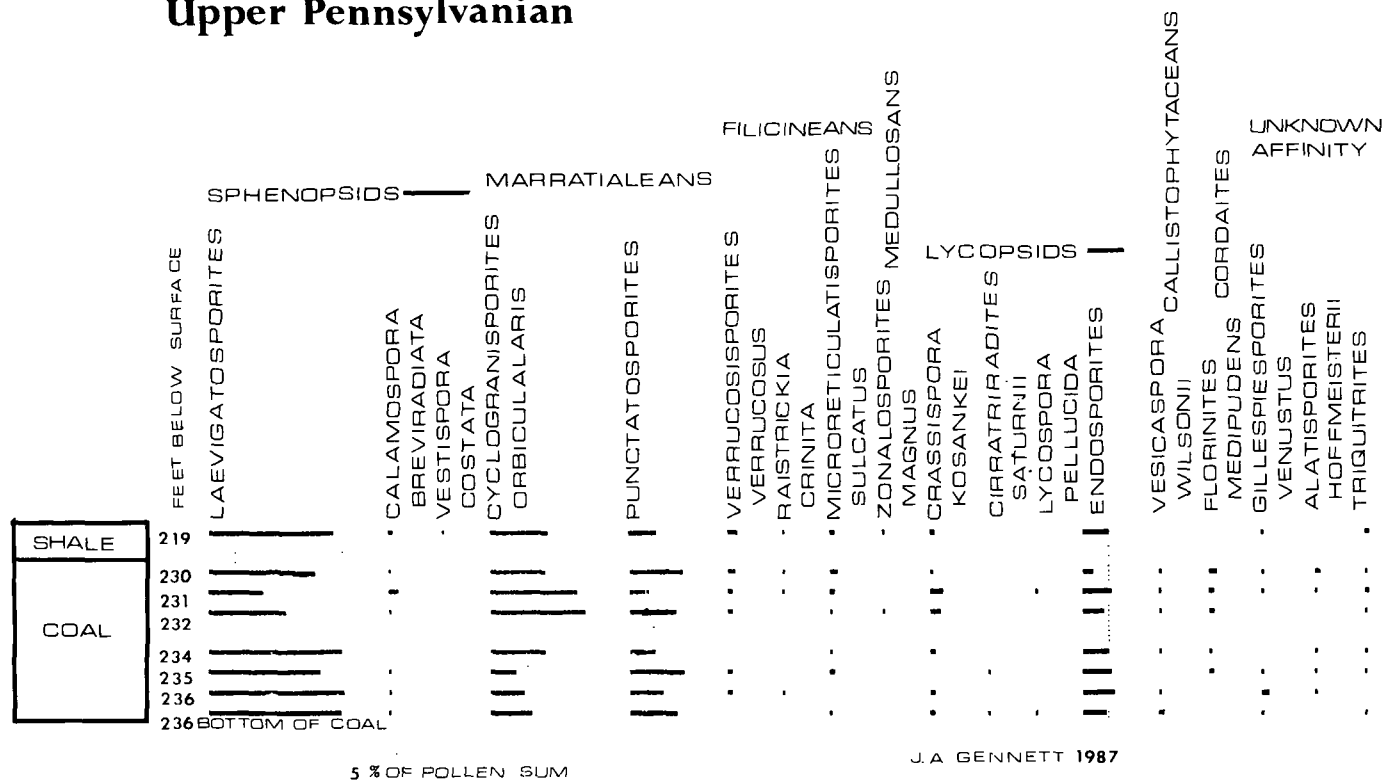
ABSTRACT

The Missourian Dalton "coal" crops out in northern Texas near Mineral Wells and is a bed within the Wolf Mountain Shale member of the Grafford Formation, Canyon Series. Technically a carbonaceous shale because of its high (70%) ash concentration, the origin of this coal is controversial. The high clastic content and lack of a rooted underburden suggest that the Dalton formed by accumulation of plant debris at the head of a small bay or lagoon. However, coal balls at the top of the seam contain large pieces of wood and roots. These deposits, consisting of the Marrattialean fern *Psaronius*, the seed fern *Medullosa*, and the gymnosperm *Cordaites*, may represent a rooted peat.

As shown below, the most important palynomorphs in the

Dalton are *Laevigatosporites* sp., *Cyclogranisporites orbicularis*, *Punctatosporites* sp., and *Endosporites globiformis*. The gymnosperms and seed ferns, although fairly abundant in the coal balls, are underrepresented in the palynomorph counts. Variation among coal samples and coal and shale samples is slight, although a reciprocal arrangement between *Laevigatosporites* sp. and *C. orbicularis* is noticeable. This lack of sequential variability is uncommon in modern peats and other Late Pennsylvanian coals into which much of the palynomorph input has been local and may represent plant successional stages. The Dalton "diagram" is more similar to those of lagoonal sequences, and consequently we believe that most of the Dalton coal is a detrital deposit.

DALTON COAL Upper Pennsylvanian



¹Geology Department, Texas A&M University, College Station, TX 77843

²Standard Oil Production Company, Dallas, TX 75240