Form 9-014

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

OPEN-FILE REPORT

# Palynological Investigations in the Upper Cretaceous and Tertiary of the Mississippi Embayment Region - V



by

Robert H. Tschudy

Denver, Colorado

August 15, 1968

This document has not been edited or reviewed for conformity with U. S. Geological Survey standards or nomenclature.

U. S. GOVERNMENT PRINTING OFFICE 16—68863-2

OPEN-FILE REPORT

# Palynological Investigations in the Upper Cretaceous and Tertiary of the Mississippi Embayment Region - V

73-283

by

Robert H. Tschudy

Denver, Colorado



August 15, 1968

CONTENTS

## Introduction

As a part of the cooperative mapping project between the Kentucky Geological Survey and the U. S. Geological Survey, a study of Cretaceous and Tertiary spores and pollen assemblages has been undertaken to aid in distinguishing formations and to facilitate surface and subsurface correlation of strata.

Reports completed from July 1, 1967 to the end of June 1968 are included in this report; others will be placed in open file as they are completed and released for general use.

REPORT ON REFERRED FOSSILS

Stratigraphic range:

General locality: Kentucky

Referred by: W. I. Finch

Report prepared by: R. H. Tschudy
7/17/67

Status of work: Complete

Kinds of fossils: None

Quadrangle or area: Hickman quad.

Shipment No.: KG-67-4D

Date material received: 3/30/67

---

Your samples FHK-5 and FHK-6 from Hickman Quadrangle Kentucky were both barren of plant microfossils. No conclusions can be drawn.

Richard H. Tschudy

R. H. Tschudy

FHK

REPORT ON REFERRED FOSSILS

Stratigraphic range: Paleocene-Eocene

General locality: Kentucky

Referred by: W. W. Olive

Report prepared by: R. H. Tschudy 7/20/67

Status of work: Complete

Kinds of fossils: Palynomorphs

Quadrangle: Dublin, Melber, Wickliffe SW, Milburn, Olmstead, Arlington, La Center quads.

Shipment No.: KG-67-3D

Date material received: 3/3/67

---

18 samples were sent for palynological examination. Sample FHK-4 from Hickman quadrangle was barren. The productive samples were given USGS Paleobotanical locality numbers as follows:

| Sample | Locality | Number |
|---|---|---|
| DDn-1 | Kentucky coordinates S1099.3-125.2; from USGS Stevens #1 well, depth 251-261 feet, LSD 480; 3 mi. E of Fulgham, Dublin quadrangle, Hickman County, Kentucky. | D3951 |
| DDn-2 | Same, depth 229-240' | D3952 |
| DDn-3 | Same, depth 392-403' | D3953 |
| DME-3 | Kentucky coordinates S1,153,000E-248,500N; from Baldree water well N. side Lebanon Church Road 6400' E. of Hwy. #45, 3½ mi. S. of Lone Oak, depth of 55 feet; Melber quadrangle, McCracken County, Kentucky. | D3954 |
| DWSW-1 | Kentucky coordinates S999.7-200.8; from auger hole near west side, of Island 2, 3, and 4; depth 127', LSD 310; Wickliffe SW quadrangle, Carlisle County, Kentucky | D3955 |

| | | |
|---|---|---|
| DMn-3 | Kentucky coordinates S1072.2-184.4; from auger hole 1¼ mi. W of Milburn; depth below 100'; probably 120-152'; elev. 372LSD; Milburn quadrangle, Carlisle County, Kentucky | D3956 |
| SME-1 | Kentucky coordinates S1,132,100E-242,800 N; from a depth of 50 feet below surface ( - 317'); Clinton Road 6000' N. of Melber, E. side at Junction of second road, north side of Mayfield bottom; Melber quadrangle, McCracken County, Kentucky. | D3957 |
| DME-2 | Kentucky coordinates S1,154,000E-239,600N; from Sullivan well, west side of Houser Road, 8600' S. of Lebanon Church Road, 5 mi. S. of Lone Oak; depth of 66-404'; Melber quadrangle, McCracken County, Kentucky. | D3958 |
| AOd-2 | Kentucky coordinates S1029.55-310.55; from auger hole 0.5 mi. ESE of mouth of Humphrey Creek; depth 62-74'; Olmstead quadrangle, Ballard County, Kentucky. | D3959 |
| DA-4 | Kentucky coordinates S1019.8-210.4; from auger hole at Laketon; depth 70-80'; LSD 327; Arlington quadrangle, Carlisle County, Kentucky. | D3960 |
| DA-5 | Same as DA-4; depth 170 ±' | D3961 |
| DA-6 | Kentucky coordinates S1021.1-170.3; from USGS Roberts #2 well near Columbus; depth 171-182', LSD 430; Arlington quadrangle, Hickman County, Kentucky. | D3962 |
| DA-7 | Same; depth 381-392', LSD 430. | D3963 |
| LLA-1 | Kentucky coordinates S1066.6-303.3; from auger hole on Ky. 358, north edge of quadrangle at T-road; depth 72'; La Center quadrangle, Ballard County, Kentucky. | D3964 |

| | | |
|---|---|---|
| LLA-2 | Kentucky coordinates S1057.2-302.4; from Lucy Creek auger hole; depth of 69-76'; La Center quadrangle, Ballard County, Kentucky. | D3965 |
| LLA-3 | Kentucky coordinates S1060.1-293.3; from auger hole Hall Hill in gravel pit north of La Center; depth 95-103'; La Center quadrangle, Ballard County, Kentucky. | D3966 |
| LLA-4 | Kentucky coordinates S1068.8-295.0; from auger hole 2½ miles NE of La Center; depth 90-108'; La Center quadrangle, Ballard County, Kentucky. | D3967 |

The palynomorphs identified from the above samples are shown on the accompanying chart.

Samples LLA-2 (D3965), LLA-3 (D3966), LLA-1 (D3964) and AOd-2 (D3959) all yielded essentially similar palynomorph assemblages. These assemblages are characteristic of the Porters Creek Clay of Paleocene age. The presence of abundant hystrichospheres and dinoflagellates suggest marine deposition.

Sample SME-1 (D3957) yielded an assemblage characteristic of the Wilcox, but not necessarily equivalent to the upper Wilcox. In fact the assemblage found can be correlated more closely with the basal than with the upper Wilcox.

Sample LLA-4 (D3967) yielded a good Wilcox assemblage. There is no possibility of it being equivalent to the Porters Creek Clay.

Sample DDN-3 (D3953) yielded an assemblage which most closely resembles an assemblage from the Sparta Formation. This sample is from the Claiborne.

Sample DA-7 (D3963) also resembles the Sparta in its palynomorph content. This sample represents the Claiborne Group.

Sample DA-5 (D3961) yielded a poor assemblage. The palynomorphs found strongly suggest that the sample is from the Sparta. A few palynomorphs are characteristic of the Cockfield. I conclude that this sample probably pertains to the upper Claiborne.

Sample DA-6 (D3962) yielded a good assemblage which compares well with assemblages from the Cockfield and Cook Mountain formations. This sample is definitely from the upper Claiborne.

Sample DME-2 (D3958) yielded palynomorphs common to the Cockfield and Sparta Formations. The assemblage definitely represents the Claiborne. Abundant hystrichospheres and a few dinoflagellates suggest marine or brackish deposition.

Samples DDn-1 (D3951) and DDn-2 (D3952) yielded essentially identical assemblages. They are similar to assemblages from the Cockfield and Cook Mountain Formations. These samples represent the upper Claiborne.

Sample DME-3 (D3954) was inadvertently plotted out of order on the chart. The palynomorphs found represent the Wilcox rather than the Claiborne.

Samples DA-4 (D3960), DWSW-1 (D3955), and DMn-3 (D3956) yielded assemblages definitely younger than any of the others. I conclude that these three samples pertain to the lower Jackson.

Robert H. Tschudy

R. H. Tschudy

RHK

| Sample | LLA-2 | LLA-3 | LLA-1 | AOd-2 | SME-1 | LLA-4 | DDn-3 | DA-7 | DA-5 | DA-6 | DME-2 | DDn-1 | DDn-2 | DME-3 | DA-4 | DMSM-1 | DDn-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | D3965 | D3966 | D3964 | D3959 | D3957 | D3967 | D3953 | D3963 | D3961 | D3962 | D3958 | D3951 | D3952 | D3954 | D3960 | D3955 | D3956 |
| Code species | | | | | | | | | | | | | | | | | |
| Dinoflagellates | X | X | X | X | | | | | | | X | | | | | | |
| Hystrichospheres | X | X | X | X | | | | | | | X | | | | | | |
| Fperi-sm5 | X | X | X | X | | | | | | | | | | | | | |
| Classo-1 | X | X | X | X | | | | | | | | | | | | | |
| P3-sm58 | X | X | | X | | | | | | | | | | | | | |
| Pa3-sm30 | X | X | | X | | | | | | | | | | | | | |
| P3-sm78B | X | X | | | | | | | | | | | | | | | |
| cf. P3-sm47 | X | X | X | X | | | | | | | | | | | | | |
| P3-sm1B | X | X | X | X | | X | | | | | | | | | | | |
| CP3-r31 | X | | | | | | | | | | | | | | | | |
| P3-sm60 | X | X | X | | | | | | | | | | | | | | |
| Pa4-rug 1 | X | X | X | | | | | | | | | | | | | | |
| P3-sm56C | X | X | X | | | | | | | | | | | | | | |
| Tax-r5 | X | X | X | X | | | | | | | | | | | | | |
| CP3-r20 | X | X | | X | | | | | | | | | | | | | |
| BCP3-rt2E | X | | | | | | | | | | | | | | | | |
| Gn-11B | X | | X | X | | | | | | | | | | | | | |
| C3-rt17B | X | X | | | | | | | | | | | | | | | |
| cf. C3-sm2 | X | | X | | | | | | | | | | | | | | |
| Fdens-sm6B | X | | X | X | | | | | | | | | | | | | |
| P3-sm6B | X | | | | | | | | | | | | | | | | |
| P3-sm79 | | X | | | | | | | | | | | | | | | |
| P3-sm19B | | X | | | | | | | | | | | | | | | |
| P3-sm75 | | X | | | | | | | | | | | | | | | |
| P3-r29 | | | X | | | | | | | | | | | | | | |
| TO-rt14B | | | X | | | | | | | | | | | | | | |
| TC-sm4A | | | | X | | | | | | | | | | | | | |
| Hemi-1A | | | | X | | | | | | | | | | | | | |
| P3-p1 | | | | | X | X | | | | | | | | X | | | |
| P3-sm30C | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X |
| P3-sm56 | | | | | X | X | X | | | | X | | | X | | | |
| P3-sm16D | | | | | X | | | | | | | | | X | | | |
| Pa6-sm1 | | | | | X | X | | | | | | | | X | | | |
| P3-sm21 | | | | | X | X | X | | | | X | | | X | | | |

| Code species \ Sample | LLA-2 | LLA-3 | LLA-1 | AOd-2 | SME-1 | LLA-4 | DDn-3 | DA-7 | DA-5 | DA-6 | DME-2 | DDn-1 | DDn-2 | DME-3 | DA-4 | DMSW-1 | DMn-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | D3965 | D3966 | D3964 | D3959 | D3957 | D3967 | D3953 | D3963 | D3961 | D3962 | D3958 | D3951 | D3952 | D3954 | D3960 | D3955 | D3956 |
| Pa3-sm30B | | | | | X | | | | | | | | | | | | |
| Pa3-sm25 | | | | | X | | | | | | | | | | | | |
| P3-sm14B | | | | | X | | | | | | | | | | | | |
| C3-pl4 | | | | | X | X | | | | | | | | | | | |
| P3-pl5 | | | | | X | | | | | | | | | | X | | |
| BCP3-rl1 | | | | | X | | | | | | | | | X | | | |
| Tax-sm1 | | | | | X | | | X | | X | | | | | | | |
| CP3-r36 | | | | | X | | | | | | | | | | | | |
| CP3-r31 | | | | | X | | | | | | | | | | | | |
| CP3-sm36 | | | | | X | | | | | | | | | | | | |
| TO-sm26 | | | | | X | | | | | | | | | X | | | |
| Pperi-r3 | | | | | X | | | | | | | | | | | | |
| P3-sm69 | | | | | X | | | | | | | | | | | | |
| Pa3-sm16 | | | | | | X | | | X | | | | | | | | |
| BCP3-rl1b | | | | | | X | | | | | | | | | | | |
| Pperi-p1 | | | | | | X | | | | | | | | | | | |
| cf. P5-sm6 | | | | | | X | | | | | | | | | | | |
| BCP3-rt2B | | | | | | X | | | | | | X | | | | | |
| Charoni sp. | | | | | | X | | X | | | | | | | | | 8 |
| P3-p9C | | | | | | X | | | | | | | | | | | |
| P3-sm43B | | | | | | X | | | | | X | | | | | | |
| Pa3-sm16E | | | | | | | X | | | | X | X | X | | | | |
| P4-foss 1 | | | | | | | X | X | X | X | X | X | X | | | | |
| Peltate leaf hair | | | | | | | X | X | | X | | X | | | X | X | X |
| C3-rt40 | | | | | | | X | X | | | | | | | | | |
| Tet-fov20 | | | | | | | X | | | | | X | X | | X | X | |
| C3-pl2 | | | | | | | X | X | | X | | | | | | | |
| BCP3-rt10 | | | | | | | X | | | | | | | | | | |
| CP3-sm34B | | | | | | | X | | | | | | | | | | |
| P3-sm16 | | | | | | | X | X | X | X | X | X | X | | X | X | X |
| P3-sm98 | | | | | | | X | X | | X | X | | | X | | | |
| CP3-rt28 | | | | | | | X | | | | X | | | | | | |
| C3-rt36 | | | | | | | X | | X | X | | | | | X | | |
| BCP3-pl | | | | | | | X | | | | | | | | | | |

| Code species \ Sample | LLA-2 | LLA-3 | LLA-1 | AOd-2 | SME-1 | LLA-4 | DDn-3 | DA-7 | DA-5 | DA-6 | DME-2 | DDn-1 | DDn-2 | DME-3 | DA-4 | DWSW-1 | DMn-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | D3965 | D3966 | D3964 | D3959 | D3957 | D3967 | D3953 | D3963 | D3961 | D3962 | D3958 | D3951 | D3952 | D3954 | D3960 | D3955 | D3956 |
| C3-p20 | | | | | | | X | | | | | | | | | | |
| CP3-rt27 | | | | | | | X | X | | | X | | | | | | |
| P3-sp4 | | | | | | | X | | | | | | | | | | |
| Gothan-1 | | | | | | | | X | | | | X | X | | X | | |
| CP4-sm2 | | | | | | | | X | | X | X | | | | X | X | X |
| Pperi-sm8 | | | | | | | | X | | X | | | | | | X | X |
| V2S/r large | | | | | | | | X | X | X | | | | | | | |
| BCP3-rt large | | | | | | | | X | X | X | | | | | | | |
| CP3-rt27B | | | | | | | | X | | | X | | | | | | |
| P3-sm72 | | | | | | | | X | X | X | | | | | | | |
| Pa3-r5B | | | | | | | | X | | | | | | | | | |
| Pperi-sm3 | | | | | | | | X | X | | | X | X | | | | |
| C3-r8 | | | | | | | | X | | | | | | | | | |
| C3-r38 | | | | | | | | X | | | | | | | | | |
| P3-p (new) | | | | | | | | X | | | | | | | | | |
| C3-r7 | | | | | | | | X | | X | | | | | | | |
| TT-sm33B | | | | | | | | X | | | | | | | | | |
| P3-sm6 | | | | | | | | X | | X | | | | | | | |
| Pa5-sm2 | | | | | | | | X | | | | X | | | | | |
| P4-sm5 | | | | | | | | | X | | | | | | | | X |
| CP3-sm53 | | | | | | | | | X | | X | X | X | | X | X | X |
| Pa4-sm1 | | | | | | | | | X | | | | | | | X | X |
| P5-foss 1 | | | | | | | | | X | | | | | | | X | X |
| Pa3-sm10 | | | | | | | | | X | | | | | | | | |
| CP2-r38 | | | | | | | | | X | X | | | | X | X | | |
| P4-sm16 | | | | | | | | | | X | | | | | X | | |
| Pperi-sm7B | | | | | | | | | | X | | | | | | X | |
| C3-p4B | | | | | | | | | | X | | | | | | | |
| P3-r42 | | | | | | | | | | X | | | | | X | | |
| M-p8 | | | | | | | | | | X | | X | X | | X | | |
| BCP3-rt30 | | | | | | | | | | X | | X | X | | | | |
| P3-sp (new) | | | | | | | | | | X | | | | | | | |
| CP3-rt14 | | | | | | | | | | X | | X | X | | X | | |
| P4-sm6 | | | | | | | | | | X | | | | | | | |

| Sample | LLA-2 | LLA-3 | LLA-1 | AOi-2 | SME-1 | LLA-4 | DDn-3 | DA-7 | DA-5 | DA-6 | DME-2 | DDn-1 | DDn-2 | DME-3 | DA-4 | DWSW-1 | DMn-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | D3965 | D3966 | D3964 | D3959 | D3957 | D3967 | D3953 | D3963 | D3961 | D3962 | D3958 | D3951 | D3952 | D3954 | D3960 | D3955 | D3956 |
| Code species | | | | | | | | | | | | | | | | | |
| TC-sm23 | | | | | | | | | | X | | | | | | | |
| Sequoia - 1 | | | | | | | | | | X | | | | | | | |
| Tet-sp (new) | | | | | | | | | | | X | | | | | | |
| CP3-sm5 | | | | | | | | | | | X | | | | | | |
| CP3-sm40B | | | | | | | | | | | X | | | | | | |
| BCP3-rt6 | | | | | | | | | | | X | | | | | | |
| C3-pl2 | | | | | | | | | | | X | | | | | | |
| Pl-fovl | | | | | | | | | | | | | | | | | |
| TT-rl2 | | | | | | | | | | | | X | X | | | | |
| CP4-sm-2B | | | | | | | | | | | | X | | | | | |
| C3-fov (new) | | | | | | | | | | | | X | | | | | |
| C3-pl4B | | | | | | | | | | | | | | X | | | |
| P3-sml5 | | | | | | | | | | | | | | X | | | |
| Sl-rtl4 | | | | | | | | | | | | | | X | | | |
| P3-sm60 | | | | | | | | | | | | | | X | | | |
| cf. TO-sm1A | | | | | | | | | | | | | | X | | | |
| M-sml1 | | | | | | | | | | | | | | X | | | |
| Sl-rt23 | | | | | | | | | | | | | | X | | | 10 |
| M-pl6 | | | | | | | | | | | | | | | X | | |
| P3-rt7B | | | | | | | | | | | | | | | X | | |
| BCP3-pl | | | | | | | | | | | | | | | X | X | X |
| Sl-rt4B | | | | | | | | | | | | | | | X | | |
| Gn-7C | | | | | | | | | | | | | | | X | | |
| Sl-rt22 | | | | | | | | | | | | | | | X | | |
| CP3syn-r7 | | | | | | | | | | | | | | | X | | |
| C3-rtl6C | | | | | | | | | | | | | | | X | X | X |
| CP3-rt44 | | | | | | | | | | | | | | | X | X | |
| Pperi-rlB | | | | | | | | | | | | | | | | X | |
| BCP3-rl4B | | | | | | | | | | | | | | | | X | |
| BCP3-rt-7B | | | | | | | | | | | | | | | | X | X |
| P3-r42A | | | | | | | | | | | | | | | | X | |
| P5 -rl | | | | | | | | | | | | | | | | X | |
| P4 -sml0B | | | | | | | | | | | | | | | | X | |
| BCP3-rt3 | | | | | | | | | | | | | | | | X | X |
| Pl-sm (new) | | | | | | | | | | | | | | | | X | |
| BCP3-rt2F | | | | | | | | | | | | | | | | | X |

REPORT ON REFERRED FOSSILS

Stratigraphic range: Eocene-Recent

General locality: Kentucky

Referred by: W. I. Finch & John Sims, 7/25/67

Report prepared by: Robert H. Tschudy, 8/23/67

Status of work: Complete

Kinds of fossils: Palynomorphs

Quadrangle or area: Cayce & Hickman quadrangles

Shipment No.: KG-67-9D
Regional Geology in Kentucky

Date material received: 7/31/67

---

Six samples were submitted for palynological examination. Samples SCY-2 and SLG-1 were barren. The remainder were given USGS Paleobotanical Locality Numbers as follows:

| Sample | Locality | Number |
|---|---|---|
| SCY-1 | 1.2 miles W of Mud Creek, drill hole LP-5-4 in sand interval 15-20' below surface (surface elev. 355' MSL); Ky. coords. 1,013,600 E.-92,300 N; Cayce quad., Fulton Co., Ky. | D4080 |
| FHK-8 | 1,100' E of Locust Grove School near floodwall, drill hole FH-19, 181-187'; Ky. coords. 984,700-121,550; Hickman quad., Fulton Co., Ky. | D4081 |
| FHK-9 | 425' west of center of floodwall on Ferry Road; drill hole FH-21, 45-52'; Ky. coords., 983,400-104,500; Hickman quad., Fulton Co., Ky. | D4082 |
| FHK-10 | Same, depth 71-80'. | D4083 |

The following palynomorphs were identified from these samples:

Sample SCY-1 (D4080) yielded Paleozoic genera, dinoflagellates, hystrichospheres and modern pollen of pine and Chenopodium. The organic material with the exception of the few modern specimens was badly corroded. I believe this sample contains a mixture of redeposited Paleozoic and younger fossils. It probably represents Quaternary alluvium.

Sample FHK-8 (D4081) yielded a good Eocene assemblage. The species found are common to the Cockfield and Moody's Branch control samples. The assemblage as a whole more nearly resembles that from Moody's Branch than it does the assemblage from the Cockfield.

Sample FHK-9 (D4082) yielded Tasmanites, a Paleozoic marine form, and modern pollen. All the identifiable palynomorphs were rare. There was much corroded organic material in this very poor sample. I believe this sample represents Quaternary alluvium.

Sample FHK-10 (D4083) yielded a good pollen and spore flora, but was very difficult to classify. Species common to the Jackson were found together with species found previously in the Bucutunna Clay. Also a few species not previously known were found. The absence of characteristic Miocene species suggests that this sample is older than Miocene. The presence of species P5-rug 1, Tsuga, VOT-r4 and several species of Ephedra (Gn.) suggests similarity to the Buctunna Clay of Oligocene age. Our Oligocene control is comparatively poor for this area. I believe this sample represents the upper Jackson or possibly the lower Oligocene.

| Sample | SCY-1 | FHK-8 | FHK-9 | FHK-10 |
|---|---|---|---|---|
| Number | D4080 | D4081 | D4082 | D4083 |
| Code species | | | | |
| Tasmanites | x | | x | |
| Lycospora | x | | | |
| Vallatisporites | x | | | |
| Pine | x | | x | |
| Fungus | x | | | |
| Chenopodiaceae | x | | x | |
| Hystrichospheres | x | | | |
| Granulatisporites | x | | | |
| Parvisaccites | x | | | |
| Densosporites | x | | | |
| Dinoflagellates | x | | | |
| Fmem-r | x | | | |
| P3-sml6 | | x | | x |
| CP4-sm2 | | x | | |
| P4-foss 1 | | x | | |
| P3-sm30C | | x | | x |
| Peltate leaf hair | | x | | x |
| cf P5-sm3 | | x | | |
| BCP3-rt7B | | x | | |
| C3-pl2 | | x | | x |
| M-r6 | | x | | |
| M-p8 | | x | | |
| V2S/sm | | x | | |
| P3-r42 | | x | | |

| Sample | SCY-1 | FHK-8 | FHK-9 | FHK-10 |
|---|---|---|---|---|
| Number | D4080 | D4081 | D4082 | D4083 |
| Code species | | | | |
| C3syn-rt (new) | | x | | |
| M-p16 | | x | | |
| Pperi-sm7B | | x | | x |
| P3-r22B | | x | | |
| P4-sm10 | | x | | |
| CP3-sm53 | | x | | |
| P4-sm1 | | x | | |
| C4-sm8 | | x | | |
| V2S/sm large | | x | | x |
| C3-rt40 | | x | | |
| BCP3-rt8 | | x | | |
| Tet-fov 2 | | x | | |
| CP3-sm5 | | x | | |
| BCP3-r14 | | x | | |
| C3-st (new) | | x | | x |
| C3-rt16B | | x | | |
| Pperi-sm3 | | x | | |
| Pperi (new) | | | x | |
| Polypodium | | | x | |
| Compositae | | | x | |
| Carya | | | x | |
| Alnus | | | x | |
| Ulmus | | | x | |
| Ovoidites | | | x | |
| Tsuga | | | | x |
| CP3-rt28 | | | | x |
| Pperi-new (large) | | | | x |
| P5-rug 1 | | | | x |
| Tax-r1 | | | | x |
| Gn7C | | | | x |
| Abies | | | | x |
| P4-sm (new) | | | | x |
| VOT-r4 | | | | x |
| TO-p (new) | | | | x |
| P4-r (new) | | | | x |
| Pperi-sm8 | | | | x |
| BCP3-rt (new) | | | | x |
| P3-sm72 | | | | x |
| P3-sm16D | | | | x |
| Pediastrum | | | | x |
| CP3-p (new) | | | | x |
| Sequoia | | | | x |

Robert H. Tschudy

REPORT ON REFERRED FOSSILS

Stratigraphic range: Paleocene-Cretaceous
Kinds of fossils: Pollen
General locality: Kentucky
Quad. or area: Blandville quad.
Referred by: T. W. Lambert
Shipment No.: KG-67-5D
Report prepared by: R. H. Tschudy 9/26/67
Date material received: 6/5/67
Status of work: Complete

---

24 samples were sent for palynological examination, with the notation that I might pick specific samples for examination. All samples processed were productive and were given USGS paleobotanical locality numbers as follows:

| Sample | Locality | Number |
|---|---|---|
| LBL-1 | Oil test well west of Cunningham; Kentucky coordinates S1079.3-224.8; Blandville quadrangle, Carlisle Co., Kentucky; depth 625-630'. | D4079-H |
| LBL-2 | Same; depth 630-635'. | D4079-G |
| LBL-3 | Same; depth 645-650'. | D4079-F |
| LBL-5 | Same; depth 655-660'. | D4079-E |
| LBL-6 | Same; depth 665-670'. | D4079-L |
| LBL-7 | Same; depth 670-675'. | D4079-K |
| LBL-8 | Same; depth 675-680'. | D4079-J |
| LBL-9 | Same; depth 685-690'. | D4079-I |
| LBL-10 | Same; depth 690-695'. | D4079-D |
| LBL-18 | Same; depth 745-750'. | D4079-C |
| LBL-22 | Same; depth 780-790'. | D4079-B |
| LBL-24 | Same; depth 805-810'. | D4079-A |

The recovery from these samples is shown on the accompanying chart.

| Sample | LBL-1 | LBL-2 | LBL-3 | LBL-5 | LBL-6 | LBL-7 | LBL-8 | LBL-9 | LBL-10 | LBL-18 | LBL-22 | LBL-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth | 625-630' | 630-635' | 645-650' | 655-660' | 665-670' | 670-675' | 675-680' | 685-690' | 690-695' | 745-750' | 780-790' | 805-810' |
| Code species No. | D4079-H | D4079-G | D4079-F | D4079-E | D4079-I | D4079-K | D4079-J | D4079-I | D4079-D | D4079-C | D4079-B | D4079-A |
| $C_3$-sm31 | X | | | | | | | | | | | X |
| Pperi-sm5 | X | X | X | | X | X | X | X | | | X | X |
| $P_3$-sm56C | X | | X | X | X | X | X | X | | | | |
| $P_3$-sm1B | X | | X | X | X | X | X | X | X | | X | X |
| Tax-r5 | X | X | X | X | | X | | X | | | X | X |
| cf. $S_1$-r17B | X | | | | | | | | | | X | |
| $P_3$-sm60 | X | | X | | X | X | | | | | X | |
| $P_3$-sm6 | X | | | | | | | | | | | |
| $P_3$-sm6B | X | | | X | X | X | | X | | | | X |
| Classo-3 | X | X | X | X | X | X | | X | X | | X | X |
| $V_2$S/sm 1 | X | | | | | | | | | | | |
| O-fov (new) | X | | | | | | | | | | | |
| Gn11B | X | X | X | X | | X | X | X | | | X | X |
| $P_3$-sm78 | X | | | | | X | | | | | | |
| $P_3$-sm58 | X | X | X | X | X | X | X | X | X | X | | X |
| $CP_3$-r20 | X | | | | | | | | | | | |
| cf. An-19 | X | | | | | | | | | | | |
| cf. $Pa_4$-rug 1 | X | | | | | | | X | | | | |
| $P_3$-sm57C | X | | X | | | | | | | | | |
| Tub-com3* | X | X | X | | X | X | | X | X | | | X |
| O-rt22* | X | X | X | X | X | X | X | X | X | | | |
| HyS-sim7* | X | | | X | | | | | | | | |
| Tub-br2* | X | X | | | | | | | | | | |
| Din-Dc-15* | X | X | | X | | | | X | | | X | |
| Poly-r 1* | X | X | | X | | | | X | X | | | |
| Tub-br3* | X | | X | | | | | | | | X | |
| Din-C5* | X | | | | | | | | | | | X |
| Microforam lining* | | X | | | | | | | | | | |
| Din-C9* | | X | | | | | | | | | | |
| Poly-sm2* | | X | | | | | | | | | | |
| Tub-com5* | | X | | X | | | | | | | | |
| Din-D2* | | X | | | | | | | | | | |
| Hyh-br4* | | X | | | | | | | | | | |
| HyL-br2* | | X | | | | | | X | | | | |
| $P_3$-r29 | | X | X | | | | | | | | | X |

KG-67-5D

| Sample | LBL-1 | LBL-2 | LBL-3 | LBL-5 | LBL-6 | LBL-7 | LBL-8 | LBL-9 | LBL-10 | LBL-18 | LBL-22 | LBL-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth | 625-630' | 630-635' | 645-650' | 655-660' | 665-670' | 670-675' | 675-680' | 685-690' | 690-695' | 745-750' | 780-790' | 805-810' |
| Code species No. | D4079-H | D4079-G | D4079-F | D4079-E | D4079-L | D4079-K | D4079-J | D4079-I | D4079-D | D4079-C | D4079-B | D4079-A |
| $P_3$-sm47 | | X | | | | X | X | X | | | | |
| Pterospermopsis* | | | X | X | X | X | | | | | | |
| $P_3$-sm75 | | | X | X | | | | | | | | |
| $P_3$-r32 | | | | X | | | | | | | | |
| $C_3$-syn-rt2 | | | | X | | | | | | | | |
| $CP_3$-r29 | | | | X | | | X | | | | | X |
| $P_3$-sm71 | | | | | X | X | | | | | | |
| $S_1$-rt8B | | | | | X | | X | X | | | | |
| $P_3$p9 | | | | | X | X | X | | | | | |
| $BCP_3$-sm6C | | | | | X | X | X | X | | | | |
| $Pa_3$-sm30 | | | | | X | X | X | X | | | X | |
| $P_3$-sm57 | | | | | X | | X | | X | | | |
| $CP_3$-r21 | | | | | | X | X | X | | | | |
| App-7 | | | | | | X | | | | | | |
| TO-rug 13 | | | | | | X | X | | | X | X | |
| $V_2S$/rt 1 | | | | | | | X | | | | | |
| Tet-st 1 | | | | | | | X | | X | | | X |
| $S_1$-r26 | | | | | | | X | | | | | |
| $S_1$-rt7 | | | | | | | X | | | | X | |
| $P_3$-sm88 ? | | | | | | | X | | X | X | | |
| Fmem-rt2 | | | | | | | | | X | | | |
| $V_2L$/rug 5 | | | | | | | | | X | X | X | |
| Lecaniella | | | | | | | | | X | | | |
| $V_2S$/rug3 | | | | | | | | | X | X | | |
| $C_3$-rt29 | | | | | | | | | X | | | |
| $P_3$-rt 12 | | | | | | | | | X | X | | |
| $Pa_3$-sm26 | | | | | | | | | X | X | X | |
| $S_1$-rt7 | | | | | | | | | X | X | | |
| $CP_3$-rt (large) | | | | | | | | | X | | | |
| TO-rug 15 | | | | | | | | | | X | | |
| App-1 | | | | | | | | | | X | | |
| App-1A | | | | | | | | | | X | | |
| $S_1$-r 10B | | | | | | | | | | X | | |
| $Pa_3$-sm25 | | | | | | | | | | X | | |

| Sample | LBL-1 | LBL-2 | LBL-3 | LBL-5 | LBL-6 | LBL-7 | LBL-8 | LBL-9 | LBL-10 | LBL-18 | LBL-22 | LBL-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth | 625-630' | 630-635' | 645-650' | 655-660' | 665-670' | 670-675' | 675-680' | 685-690' | 690-695' | 745-750' | 780-790' | 805-810' |
| Code species No. | D4079-H | D4079-G | D4079-F | D4079-E | D4079-L | D4079-K | D4079-J | D4079-I | D4079-D | D4079-C | D4079-B | D4079-A |
| $P_3$-sm75D | | | | | | | | | | X | | |
| Fmem-sm6B | | | | | | | | | | X | | |
| Fmem-rt 1 | | | | | | | | | | X | | |
| TC-sm25 | | | | | | | | | | X | | |
| $S_1$-r 18 | | | | | | | | | | X | | |
| Ea-rug2 | | | | | | | | | | X | | |
| Fustispollenites | | | | | | | | | | X | | |
| $S_1$-p4 | | | | | | | | | | X | | |
| $P_4$-sm 13 | | | | | | | | | | | X | |
| TO-rug 11B | | | | | | | | | | | X | X |
| $CP_3$-sml4B | | | | | | | | | | | X | |
| $C_5$-r 1 | | | | | | | | | | | X | |
| M-rt4 | | | | | | | | | | | X | |
| $P_3$-sm 19B | | | | | | | | | | | | X |
| Hemi-4 | | | | | | | | | | | | X |

Difficulty working with well cuttings is demonstrated by the fact that many of the samples yielded a few modern contaminants (Carya, compositae and chenopodiaceae pollen) probably originating from the drilling mud, and by the Paleocene contamination of samples from the deeper parts of the hole probably as a result of up-hole caving.

Samples LBL-1, LBL-2, LBL-3, and LBL-5 yielded characteristic suites of plant microfossils that have previously been found in the Porter's Creek Clay. These samples also yielded many hystrichospheres and dinoflagellates indicating marine deposition. Sample LBL-2 in particular yielded an abundance of marine forms and very few pollen grains. Marine fossils are indicated on the chart by an asterisk*.

Samples LBL-6, LBL-7, LBL-8, and LBL-9 also yielded a lower Paleocene pollen suite characterized by the species Pperi-sm5, $P_3$-sm 1B, $P_3$-sm6B, and GN-11B. In addition, these samples yielded $P_3$-p9, $BCP_3$-sm6C, and $Pa_3$-sm30, characteristic of the Clayton Formation. The interval represented by these samples I believe represents the Clayton Formation. Samples LBL-6, LBL-7, and LBL-8 yielded very few hystrichospheres and dinoflagellates. Sample LBL-9 was definitely more marine, perhaps representing the basal marine limestone of the Clayton Formation. The sample, however, was only slightly calcareous.

Sample LBL-10 was the first sample that yielded definite Cretaceous species. The assemblage as a whole can be most favorably compared with the assemblage from the Owl Creek Formation. The species $P_3$-sm 1B was also found in this sample. This species has never been found below the Paleocene and probably indicates up-hole caving.

Sample LBL-18 yielded a Cretaceous assemblage. No strictly Paleocene fossils were found. The assemblage resembles the Owl Creek and upper McNairy control assemblages.

Samples LBL-22 and LBL-24 yielded McNairy fossils badly contaminated with Paleocene fossils. I have to conclude that these samples represent the McNairy intermixed with much caved material from the Paleocene.

I believe the Porter's Creek Clay is represented from 625 to 655-660 feet with the possibility that sample LBL-5 from 665-660 feet may represent the Clayton. The interval between 660 feet and 690 feet represents the Clayton. The sample from 690-695 feet and possibly also the sample from 745-750 feet represents the Owl Creek Formation. From about 750 feet to the bottom of the hole at 810 feet the McNairy Formation is represented. The Cretaceous-Paleocene boundary is between 690 and 695 feet, that is, between samples LBL-9 and LBL-10.

Robert H. Tschudy

R. H. Tschudy

RHT/mk

REPORT ON REFERRED FOSSILS

Stratigraphic range: Paleocene-Eocene

General locality: Kentucky, Missouri, and Illinois

Referred by: W. I. Finch, T. W. Lambert, R. W. Swanson, 9/22/67

Report prepared by: Robert H. Tschudy, 11/8/67

Status of work: Complete

Kinds of fossils: Palynomorphs

Quadrangle or area: Cairo, Hickman and Melber quadrangles

Shipment No.: KG-67-10D
Regional Geology in Kentucky

Date material received: 9/26/67

---

Eleven samples were submitted for palynological examination. Sample SME-6 was barren. The remainder were assigned USGS Paleobotanical Locality Numbers as follows:

| Sample | Locality | Number |
|---|---|---|
| LC-1 | Mound City Dam site; Hole MD-110, sample 17, depth 40.5-41.0 ft, Ky. coords. S1002.38-286.58, Cairo quad., Ballard Co., Ky. | D4090 |
| LC-2 | Mound City Dam site; Hole MD-108, sample 27, depth 54-54.5 ft; LSD 268.4, Ky. coords. S1002.38-286.58, Cairo quad., Ballard Co., Ky. | D4091 |
| LC-3 | Mound City Dam site; Hole MD-110*, sample 52, depth 93.6-94.2 ft; Ky. coords. S1003.92-288.77, Cairo quad., Ballard Co., Ky. | D4092 |

* Sample LC-1 was from Hole MD-110 and sample LC-3 was from Hole MD-110, but the Kentucky coordinates for this hole are different. Please straighten this out for me.

| | | |
|---|---|---|
| LC-4 | Mound City Dam site; Hole MD-112, sample 38, depth 88.9-89.4 ft, Ky. coords. S1001.66-286.33; LSD 315.9, Cairo quad., Pulaski Co., Ill. (300' from Kentucky) | D4093 |
| LC-5 | Mound City Dam site; Hole MD-108, sample 18, depth 42.0-42.5 ft, Ky. coords. S1002.38-286.58, Cairo quad., Ballard Co., Ky. | D4094 |

| Sample | Locality | Number |
|---|---|---|
| LC-6 | Mound City Dam site; Hole MD-108, sample 75, depth 126.0-126.5 ft, Ky. coords. S1002.38-286.58; LSD 268.4, Cairo quad., Ballard Co., Ky. | D4095 |
| FHK-11 | Drill hole FH-38, 1 mile WSW of Dorena, elevation 304', depth 103-117 ft, Ky. coords. S973,400-109,000; Hickman quad., Mississippi Co., Mo. | D4096 |
| FHK-12 | Drill hole FH-39, 500 ft NW of BM 321, elevation 312', depth 177-182 ft, Ky. coords. S983,700-115,850; Hickman quad., Mississippi Co., Mo. | D4097 |
| FBO-1 | Drill hole FB-4, 6,500' down river and 400' from west bank of Mississippi River, elevation 295', depth 123-132 ft, Bondurant, Fulton Co., Ky. | D4098 |
| FHK-13 | Hickman water well about 1 mile south of Hickman, elevation 383', depth 725 ft, Ky. coords. 991,700-96,550; Hickman quad., Fulton Co., Ky. | D4099 |

The palynomorphs identified from the above samples are shown on the accompanying chart.

Samples LC-3 (D4092) and LC-6 (D4095) yielded fossil assemblages that are characteristic of the Porters Creek Clay. As may be seen from the chart, these assemblages are distinctly different from assemblages from the overlying Wilcox, not only in pollen and spore content, but also in content of palynomorphs of marine origin (hystrichospheres and dinoflagellates).

Sample LC-1 (D4090) was poor. The palynomorphs were obscured by much fine organic debris. Sufficient palynomorphs were identified to identify this sample as pertaining to the Wilcox group.

Sample LC-2 (D4091) yielded an assemblage clearly pertaining to the Wilcox group. The code species C3 syn-rtl has been seen previously in the Pine Top sample (D3659).

Sample LC-5 also was poor, yielding few palynomorphs and much fine fusinized organic matter. This sample is clearly younger than Porters Creek. I conclude that it pertains to the Wilcox group.

Sample LC-4 (D4093) was somewhat anomalous, yielding several new species of palynomorphs in relative large numbers. The remainder of the assemblage has been found in Recklaw, Tallahatta and Sparta control assemblages. This sample I believe is from the Claiborne group, and probably from the lower Claiborne.

Sample FHK-13 (D4099) yielded an assemblage that clearly pertains to the Claiborne group. It resembles control material from the upper part of the Claiborne group, particularly from the Cockfield Formation.

Sample FHK-11 (D4096) yielded many pollen grains representative of Pine, Fir, and Spruce as well as the Compositae. Intermixed with these Recent types, were fossil pollen grains of Eocene age. It is probable that the material sent for examination contained a mixture of Recent alluvium and Jackson age clays.

Samples FHK-12 (D4097) and FBO-1 (D4098) yielded fossils that are common to Jackson age rocks. Some of these fossils have not been seen in rocks older than Jackson. A Jackson assignment is clearly indicated.

Robert H. Tschudy

FHK

| Sample | LC-3 | LC-6 | LC-1 | LC-2 | LC-5 | LC-4 | FHK-13 | FHK-11 | KG-67-10D FHK-12 | FBO-1 |
|---|---|---|---|---|---|---|---|---|---|---|
| Number | D4092 | D4095 | D4090 | D4091 | D4094 | D4093 | D4099 | D4096 | D4097 | D4098 |
| Code Species | | | | | | | | | | |
| Fdens-sm6B | x | | | | | | | | | |
| P3-sm1B | x | x | | x | x | | | | | |
| Pperi-sm5 | x | x | | | | | | | | |
| P3-sm6B | x | x | | | | | | | | |
| Classo-3 | x | x | | | | | | | | |
| Tax-r5 | x | x | | | | | | | | |
| P3-sm60 | x | x | | | | | | | | |
| P3-sm58 | x | x | | | | | | | | |
| TO-p4B | x | x | | | | | | | | |
| Gn-11B | x | x | | | | | | | | |
| Sequoia-1 | x | | | | | | | | | |
| P3-sm75 | x | | | | | | | | | |
| P3-r29 | x | x | | | | | | | | |
| Hystrichospheres | x | x | | | | | | | | |
| Dinoflagellates | x | x | | | | | | | | |
| Pa3-sm30 | | x | | | | | | | | |
| P3-sm56C | | x | | | | | | | | |
| BCP3-rt2E | | x | | | | | | | | |
| CP3-sm14 | | x | | | | | | | | |
| C3-rt17B | | x | | | | | | | | |
| P3-sm60B | | x | | | | | | | | |
| P3-sm57C | | x | | | | | | | | |
| P3-sm78 | | x | | | | | | | | |
| P3-p1 | | | x | | x | | | | | |
| Tax-sm1B | | | x | | x | | | | | |
| CP3-r31 | | | x | x | | | | | | |
| P3-sm30A | | | x | | x | x | | x | | |
| C3-sm23 | | | x | | | | | | | |
| O-fov1 | | | x | | | | | | | |
| CP3-r27 | | | x | | | | | | | |
| P3-sm43 | | | x | x | x | | | | | |
| CP3-rt25 | | | x | | | | | | | |
| C3-rt16B | | | x | x | x | | | | | |
| cf V2S/r14 | | | x | x | | | | | | |
| Pa4-sm1 | | | x | | | | | | | |
| CP3-s[redacted] | | | x | | | | | | | |

| Code | Species | Sample Number | LC-3 D4092 | LC-6 D4095 | LC-1 D4090 | LC-2 D4091 | LC-5 D4094 | LC-4 D4093 | FHK-13 D4099 | FHK-11 D4096 | FHK-12 D4097 | FBO-1 D4098 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | V2L/sm5 | | | | x | | x | | | | | |
| | Tplan-sm1C | | | | | x | x | | | | | |
| | P3-sm56 | | | | | x | | x | x | | | |
| | C3syn-rt1 | | | | | x | | | | | | |
| | P3-sm56D | | | | | x | | | | | | |
| | BCP3-rt2B | | | | | x | | | | | | x |
| | P3-sm91 | | | | | x | | | | | | |
| | C3-p14 | | | | | x | | | | | | |
| | P3-p9B | | | | | x | | | | | | |
| | M-r3 | | | | | x | x | | | | | |
| | P3-sm69 | | | | | x | x | | | | | |
| | P4-sm3 | | | | | | x | | | | | |
| | Pa5-sm1 | | | | | | x | | | | | x |
| cf | P3-sm104 | | | | | | | x | | | | |
| | P3-sm16D | | | | | | | x | x | x | x | x |
| cf | C3-rt18E | | | | | | | x | | | | |
| | P3-sm98 | | | | | | | x | | | | |
| | CP3-r38 | | | | | | | x | | | | |
| | BCP3-rt10 | | | | | | | x | | | | |
| | Pa4-sm1 | | | | | | | x | x | | x | |
| | CP3-p4B | | | | | | | x | | | | |
| | C3-rt28 | | | | | | | x | | | | |
| cf | C3-rt40 | | | | | | | x | | | | |
| | CP3-rt27 | | | | | | | x | | | | |
| | P3-sm43B | | | | | | | x | | | | |
| | CP3-sm5 | | | | | | | x | | | x | x |
| | CP4-sm2 | | | | | | | x | | | | |
| | Pa3-sm25C | | | | | | | x | | | | |
| | Pperi-sm3B | | | | | | | | x | | | |
| | P4-foss1 | | | | | | | | x | | | |
| | Pa3-sm30B | | | | | | | | x | | | |
| | C3-rt36 | | | | | | | | x | | | x |
| | C4-sm8 | | | | | | | | x | x | | |
| | P3-sp5 | | | | | | | | x | | | |
| | Peltat[illegible]eaf hair | | | | | | | | x | | | x |

| | | | | | | | KG-67-10D | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample | LC-3 | LC-6 | LC-1 | LC-2 | LC-5 | LC-4 | FHK-13 | FHK-11 | FHK-12 | FBO-1 |
| Number | D4092 | D4095 | D4090 | D4091 | D4094 | D4093 | D4099 | D4096 | D4097 | D4098 |
| Code Species | | | | | | | | | | |
| P3-sm30C | | | | | | | x | x | x | x |
| P1-sp2 | | | | | | | x | | | |
| Pa3-sm10 | | | | | | | x | | | |
| P4-sm10 | | | | | | | x | x | x | |
| CP3-sm53 | | | | | | | x | x | x | x |
| Pperi-r1B | | | | | | | x | | x | |
| Azolla-Glochidium | | | | | | | x | | | |
| Gothan-1 | | | | | | | x | | | |
| P3-sm106 | | | | | | | x | | | |
| P3-sm16 | | | | | | | x | x | x | x |
| Pperi-sm7B | | | | | | | | x | x | x |
| Gn-7C | | | | | | | | x | x | x |
| P3-sm72 | | | | | | | | x | | |
| C3-p12 | | | | | | | | x | x | x |
| Pperi-sm8 | | | | | | | | | x | x |
| C3-rt44 | | | | | | | | | x | x |
| cf C3-p20B | | | | | | | | | x | |
| CP3-r47 | | | | | | | | | x | x |
| C3-rt16C | | | | | | | | | x | x |
| C3-r16 | | | | | | | | | x | |
| CP4-sm2B | | | | | | | | | | x |
| P4-sm1 | | | | | | | | | | x |
| M-p8 | | | | | | | | | | x |
| P3-r42A | | | | | | | | | | x |

REPORT ON REFERRED FOSSILS

Stratigraphic range: Paleocene-Eocene

Kinds of fossils: Palynomorphs

General locality: Tennessee and Arkansas

Quad. or area: Paris, Tennessee and Little Rock, Arkansas

Referred by: W. W. Olive

Shipment No.: KG-67-11D

Report prepared by: R. H. Tschudy
Feb. 19, 1968

Date material received: Dec. 4, 1967

Status of work: Complete

---

10 samples were submitted for palynological examination. Samples OE-5, A-4-1, and A-12-1 were barren; the remainder were given USGS Paleobotanical Locality Numbers as follows:

| Sample | Locality | Number |
|---|---|---|
| OPA-1 | 200' ± west of Hwy. 641, 0.2 mi. N. of Louisville and Nashville RR; Kentucky coordinates, 1,314,300-707,350; Paris, Henry Co., Tennessee. | D4113 |
| A-2-1 | Ward, Ark. Bypass I-30 around Little Rock, T. 1 N., R. 12 W.; Little Rock 1:250,000, Saline, Arkansas. | D4114 |
| A-3-1 | Granite Mtn. Quarry, T. 1 N., R. 12 W., Saline, Arkansas. | D4115 |
| A-9 | 1 mi. SW Mabelvale, Ark. along Missouri Pacific RR; T. 1 S., R. 13 W., Saline, Arkansas; Little Rock 1: 250,000. | D4116 |
| A-10-4 | ¼ mi. from BH 253; NE¼SW¼ sec. 17, T. 45, R. 17 W.; Saline, Arkansas; Little Rock 1:250,000. | D4117 |
| A-13-1 | Malvern Brick Co. Clay Pit, sec. 36, T. 45, R. 17 W.; Saline, Arkansas; Little Rock 1:250,000. | D4118-A |
| A-13-2 | Ditto | D4118-B |

Palynomorphs identified from these samples are shown below.

| Sample | OPA-1 | A-2-1 | A-3-1 | A-9 | A-10-4 | A-13-1 | A-13-2 |
|---|---|---|---|---|---|---|---|
| Number / Code species | D4113 | D4114 | D4115 | D4116 | D4117 | D4118-A | D4118-B |
| Pperi-sm5 | X | X | | X | X | | |
| $P_3$-sm 1B | X | X | X | X | X | | |
| $Pa_3$-sm30 | X | X | | X | X | | |
| $P_3$-sm58 | X | | X | X | X | | |
| Tax-r5 | X | X | | X | | X | |
| $BCP_3$-rt2E | X | | X | | | | |
| $P_3$-sm60B | X | | | | | | |
| $C_3$-sm31 | X | | | X | | | |
| Gn-11B | X | X | | | X | | |
| $P_3$-sm19B | X | | | | | | |
| $P_3$-sm6B | X | | | | | | |
| $CP_3$-sm 14 | X | | | | | | |
| $S_1$-sm 13B | X | | | | | | |
| Anemia 18 | X | | | | | | |
| $V_2L$/r4 | X | | | | | | |
| $Pa_3$-p4 | X | | | | | | |
| cf.$CP_3$-r31 | X | | | | | | |
| Class6-3 | X | X | | X | X | X | |
| $P_3$-sm56C | X | | | X | X | X | X |
| $S_1$-rt8B | X | | | X | | | |
| $P_3$-sm60 | X | X | | X | | | |
| $V_2S$/rt 1 | X | | | | | | |
| TO-rug 14 | X | | | | | | |
| O-rt22 | X | X | | | | | |
| Din-DC 15 | X | X | X | X | X | | |
| Tub-sm7B | X | | | | | | |
| Poly-r 1 | X | | | | | | |
| Poly-sm 1 | X | | | | | | |
| Hy 1-br4 | X | X | X | X | X | | |
| $C_3$-rt 17B | | X | | | | | |
| $Pa_5$-sm 1 | | X | X | | | | |
| V2L/p5B | | X | | | | | |
| $P_3$-sm 1A | | X | | | | | |
| Pperi-p2 | | X | | | | | |
| $P_3$-sm 75 | | X | | | | | |
| $P_3$-sm6B | | X | | | | | |
| $Pa_3$-sm56 | | | X | | | | |
| Fdens-sm6C | | | X | X | | | |
| $BCP_4$-rt (new) | | | X | | | | |
| $C_5$-rt (new) | | | X | | | | |
| $P_3$-sm 7 | | | X | | | | |
| $C_3$-st (new) | | | X | | | | |
| $C_3$-syn-r9 | | | X | | | | |

| Sample | OPA-1 | A-2-1 | A-3-1 | A-9 | A-10-4 | A-13-1 | A-13-2 |
|---|---|---|---|---|---|---|---|
| Number / Code species | D4113 | D4114 | D4115 | D4116 | D4117 | D4118-A | D4118-B |
| TO- rt2 | | | X | | | | |
| Horologinella | | | X | | | | |
| $C_3$-rt 16 var (new) | | | X | | | | |
| Gn-7C | | | X | | | | X |
| $C_3$-P (Ilex new) | | | X | | | | |
| $P_7$-sm (Juglans new) | | | X | | | | |
| Pterospermopsis | | | X | | | | |
| Micrhystridium | | | X | X | | | |
| $P_4$-p 1 | | | | X | | | |
| TO-rug 24 | | | | X | | | |
| Gn-11C | | | | X | | | |
| $P_3$-sm 47 | | | | X | X | | |
| $BCP_3$-r 11 | | | | X | | | |
| $S_1$-rt8C | | | | | X | | |
| $S_1$-sm5 | | | | | X | | |
| $P_3$-sm6 | | | | | | X | |
| $CP_4$-sm2 | | | | | | X | X |
| $P_6$-sp 1B | | | | | | X | X |
| Peltate Leaf Hair | | | | | | X | |
| $P_3$-sm 98 | | | | | | X | |
| cf.$C_3$-rt 26 | | | | | | X | X |
| $C_3$-rt4 | | | | | | X | X |
| $P_4$-foss 1 | | | | | | X | |
| $BCP_3$-rt2 | | | | | | X | |
| M-p 8 | | | | | | X | X |
| $C_3$-rt39 | | | | | | X | |
| $CP_3$-sm53 | | | | | | X | |
| $CP_3$-rt28 | | | | | | X | |
| $S_1$fov (new) | | | | | | X | |
| $P_3$-sm 16 | | | | | | X | X |
| $C_4$-rt 2 | | | | | | X | X |
| $P_3$-p 5 | | | | | | X | |
| Tet-fov 2 | | | | | | X | |
| $CP_3$-sm34B | | | | | | X | |
| Tetraporina | | | | | | X | |
| $C_3$-sm 1B | | | | | | | X |
| $P_3$-sm 98 | | | | | | | X |
| $BCP_3$-r 14 | | | | | | | X |
| $C_3$-rt 27B | | | | | | | X |
| $CP_3$-r 38 | | | | | | | X |
| $S_1$-rt 22 | | | | | | | X |
| $C_3$-P 12 | | | | | | | X |
| $BCP_3$-rt 4 | | | | | | | X |
| $C_3$-rt 40 | | | | | | | X |

Sample OPA-1 (D4113) yielded a definite Porter's Creek assemblage. The assemblage is almost identical to that from D3285.

Sample A-2-1 (D4114) was poor, the pollen was corroded. It represents the Porter's Creek Clay. The pollen fossils were small and abundant small organic debris was present. These facts, combined with the hystrichospheres and dinoflagellates suggests offshore marine deposition.

Sample A-3-1 (D4115) yielded a Midway assemblage. It is not, however, equivalent to the Clayton of Kentucky and Tennessee. The new species suggest a different source. Hystrichospheres, dinoflagellates, Micrhystridium, and Pterospermopsis indicate marine deposition.

Sample A-9 (D4116) was dominated by hystrichospheres, dinoflagellates, and small particles of organic debris. The assemblage is of Midway age but not equivalent to the Clayton of Kentucky and Tennessee. It was probably deposited under offshore marine conditions.

Sample A-10-4 (D4117) was poor, except for the dominance of hystrichospheres and dinoflagellates. It is of Paleocene age and was probably deposited under offshore marine conditions.

Sample A-13-1 (D4118-A) yielded an assemblage that represents the Claiborne rather than the Wilcox. I believe it represents the upper Claiborne. The presence of a few dinoflagellates suggests slight marine influence.

Sample A-13-1 (D4118-B) also yielded an assemblage of Claiborne age. Its closest control equivalent is the Cockfield. There was no evidence of marine depositional conditions in this sample.

Robert H. Tschudy

RHK

REPORT ON REFERRED FOSSILS

KG-67-12D

Stratigraphic range: Paleocene-Eocene

Kinds of fossils: Palynomorphs

General locality: Kentucky

Quad. or area: Melber Quadrangle

Referred by: Roger W. Swanson

Shipment No.: KG-67-12D

Report prepared by: R. H. Tschudy
Mar. 20, 1968

Date material received: Dec. 6, 1967

Status of work: Complete

---

37 samples were sent for palynological examination with the instructions that we should examine only enough samples to identify the sequence. The samples were given tentative USGS paleobotanical locality numbers as follows: (Only those with an asterisk* were processed and examined.)

| Sample | | Depth (Feet) | Number |
|---|---|---|---|
| SME-6 | Drill hole no. 12, on Krebs Sta. Rd., 380' W. of E. boundary of quad; Kentucky coordinates 1,160,100 E.-253,600 N., Melber quad., McCracken Co., Ky. | 82 | D4131* |
| SME-7 | Drill hole no. 13, on Krebs Sta. Rd., 170' W. of Houser Rd., Kentucky coordinates 1,157,500 E.-253,600 N.; Melber quad., McCracken Co., Ky. | 100 | D4132* |
| SME-8 | Drill hole no. 15, on Krebs Sta. Rd., 1 mile W. of Houser Rd., Kentucky coordinates 1,152,200 E.-253,800 N., Melber quad., McCracken Co., Ky. | 55 | D4133-K |
| | | 56 | D4133-J |
| | | 60 | D4133-I |
| | | 62 | D4133-H |
| | | 65 | D4133-G |
| | | 70 | D4133-F* |
| | | 75 | D4133-E |
| | | 80 | D4133-D |
| | | 85 | D4133-C |
| | | 90 | D4133-B |
| | | 97 | D4133-A* |

| | | | |
|---|---|---|---|
| SME-9 | Drill hole no. SME-20, on Lebanon Church Rd. 330' W. of Blizzard Ponds ditch; Kentucky coordinates 1,159,500 E.-248,200 N., Melber quad., McCracken Co., Ky. | 42 | D4134-C* |
| | | 44 | D4134-B* |
| | | 47 | D4134-A* |
| SME-10 | Drill hole no. SME-21, on Houser Road, 275' N. of Blizzard Ponds ditch, Kentucky coordinates 1,157,600 E.-250,100 N., Melber quad., McCracken Co., Ky. | 31 | D4135-H* |
| | | 35 | D4135-G* |
| | | 37 | D4135-F* |
| | | 40 | D4135-E* |
| | | 41 | D4135-D* |
| | | 42 | D4135-C |
| | | 44 | D4135-B |
| | | 46 | D4135-A* |
| SME-11 | Drill hole no. SME-22 on Houser Rd., 510' N. of S. Branch Blizzard Ponds ditch; Kentucky coordinates 1,157,300 E.-246,100 N., Melber quad., McCracken Co., Ky. | 31 | D4136-I* |
| | | 34 | D4136-H* |
| | | 36 | D4136-G |
| | | 38 | D4136-F |
| | | 40 | D4136-E |
| | | 44 | D4136-D |
| | | 46 | D4136-C |
| | | 48 | D4136-B |
| | | 52 | D4136-A* |
| SME-12 | Drill hole no. SME-24, on Davis Rd., 40' N. of Camp Creek, Kentucky coordinates 1,154,100 E.-236,200 N., Melber quad., McCracken Co., Ky. | 25 | D4137-D |
| | | 27 | D4137-C |
| | | 32 | D4137-B* |
| | | 41 | D4137-A* |

Palynomorphs identified from the samples examined are shown on the following chart.

| Sample | SME-6 | SME-7 | SME-8 | SME-8 | SME-9 | SME-9 | SME-10 | SME-10 | SME-10 | SME-11 | SME-11 | SME-11 | SME-12 | SME-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (ft) | 82 | 100 | 70 | 97 | 42 | 47 | 31 | 41 | 46 | 31 | 34 | 52 | 32 | 41 |
| Number | D4131 | D4132 | D4133-F | D4133-A | D4134-C | D4134-A | D4135-H | D4135-D | D4135-A | D4136-I | D4136-H | D4136-A | D4137-B | D4137-A |
| Code Species | | | | | | | | | | | | | | |
| $P_3$-sm 1B | X | | X | X | X | X | X | X | X | X | X | | X | X |
| Classo-3 | X | | X | | X | X | X | X | X | X | X | X | | |
| Tax-r5 | X | X | X | X | X | X | X | X | X | X | X | | | |
| cf. $C_3$-rt25 | X | X | | | | | | | | | | | | |
| $P_3$-sm30 | X | X | | | X | | X | X | | | | X | | |
| dinoflagellates | X | | | | X | X | X | X | X | X | X | X | | |
| M-sm8 | | X | | | | | | | | | | | | |
| $P_3$-sm43B | | | X | | | | | | | | | | X | |
| $P_3$-sm30 | | | X | X | | | | | | | | | X | |
| $P_3$-sm68 | | | X | | | | | | | | | | | |
| $Pa_5$-sm 1 | | | X | | | | X | | | | | | | |
| $P_4$-sm3 | | | X | X | | | | | | | | | | |
| $Pa_3$-sm25C | | | X | X | | | | | | | | | X | |
| $P_3$-sm56 | | | X | X | | | | | | | | | X | X |
| $P_3$-p9C | | | X | X | | | | | | | | | | |
| $P_3$-sm30B | | | X | | | | | | | | | | | |
| $C_3$-rt23 | | | | X | | | | | | | | | | |
| $C_3$-p 14 | | | | X | | | | | | | | | X | |
| $P_3$-sm43E | | | | X | | | | | | | | | | |
| $S_1$-rt 10B | | | | X | | | | | | | | | | |
| Pperi-sm5A | | | | X | | | | | | | | | | |
| $CP_3$-sm35B | | | | X | | | | | | | | | | |
| $BCP_3$- 11 | | | | X | | | | | | | | | X | |
| $CP_3$-sm46 | | | | X | | | | | | | | | | |
| $CP_3$-r28 | | | | X | | | | | | | | | | X |
| $P_3$-p 1 | | | | X | | | | | | | | | X | |
| $C_3$-sm31 | | | | | X | | | | | | | | | |
| $P_3$-sm56C | | | | | X | X | | | | X | | | | |
| Pperi-sm5 | | | | | X | X | X | X | | X | X | X | X | |
| $Pa_4$-sm30 | | | | | X | | | | | | X | | | |
| Sequoia | | | | | X | | | | | | | | X | |
| $BCP_3$-rt2E | | | | | X | | | | | | | | | |
| $P_3$-sm58 | | | | | X | | | | | | | | | |
| Hystrichospheres | | | | | X | X | | X | | X | | | X | |
| Gn-11B | | | | | | X | X | | X | | | | | |
| TO-rug 2 | | | | | | X | | | | X | | | | |
| $S_1$-rt6 | | | | | | X | | | | | | | | |
| Microforam | | | | | | X | | | | | | | X | |
| Fdens-sm6B | | | | | | | X | | X | | | X | | |
| $P_3$-sm75 | | | | | | | X | X | | | | | | |

| Sample | SME-6 | SME-7 | SME-8 | SME-8 | SME-9 | SME-9 | SME-10 | SME-10 | SME-10 | SME-11 | SME-11 | SME-11 | SME-12 | SME-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (ft) | 82 | 100 | 70 | 97 | 42 | 47 | 31 | 41 | 46 | 31 | 34 | 52 | 32 | 41 |
| Number | D4131 | D4132 | D4133-F | D4133-A | D4134-C | D4134-A | D4135-H | D4135-D | D4135-A | D4136-I | D4136-H | D4136-A | D4137-B | D4137-A |
| Code Species | | | | | | | | | | | | | | |
| Schizocystia | | | | | | | X | | | | | | | |
| $C_3$-rt 178 | | | | | | | | X | | | | | | |
| $P^3_3$-sm68 | | | | | | | | | X | | | | | |
| Gleich. 48 | | | | | | | | | X | X | | X | | |
| Aquila sp. | | | | | | | | | X | | | | | |
| $V_2$S/r | | | | | | | | | X | | | | | |
| $P^2_3$-r32 | | | | | | | | | | X | | | | |
| Tasmanites | | | | | | | | | | X | | | | |
| $P_3$-sm57C | | | | | | | | | | | X | | | |
| $P^3_3$-sm68 | | | | | | | | | | | X | X | | |
| $Pa^3_4$-rug 1 | | | | | | | | | | | X | | | |
| TO-p48 | | | | | | | | | | | X | | | |
| $Pa_3$-sm25 | | | | | | | | | | | | X | X | |
| $CP^3_3$-sm 148 | | | | | | | | | | | | | X | |
| M-Sm5 | | | | | | | | | | | | | X | |
| $CP_3$-sm36 | | | | | | | | | | | | | X | |
| $CP^3_3$-rt 14 | | | | | | | | | | | | | X | |
| $P^3_3$-sm 160 | | | | | | | | | | | | | X | |
| $V^3_2$S/r 11 | | | | | | | | | | | | | | X |
| $P^2_3$-r27 | | | | | | | | | | | | | | |

Sample SME-6 (D4131) yielded a very poor, corroded assmeblage. It is probably Porters Creek. Dinoflagellates indicate marine deposition.

Sample SME-7 (D4132) also was very poor, yielding much fine organic debris. I cannot be sure of this, but suspect Porters Creek. It was probably deposited in an offshore marine depositional environment.

The two samples examined from SME-8 (D4133-F and D4133-A) yielded definite Wilcox assemblages. The environment of deposition was definitely nonmarine.

The two samples examined from SME-9 (D4134-C and D4134-A) yielded good Porters Creek assemblages. They both yielded hystrichospheres and dinoflagellates, and sample D4134-A yielded microforams. These forms indicate a marine depositional environment.

Three samples were examined from SME-10 (D4135-H, D4135-D, and D4135-A). All yielded assemblages containing abundant dinoflaglates and comparatively few pollen grains. The assemblages are similar to those obtained from the Porters Creek Clay. Deposition under marine conditions is indicated by the dinoflagellates.

Slides from samples D4135-E, D4135-F, and D4135-G were scanned and found to contain marine Porters Creek assemblages.

Three samples from SME-11 were examined (D4136-I, D4136-H, and D4136-A). These samples all yielded marine Porters Creek assemblages.

The two samples examined from SME-12 (D4137-B and D4137-A) yielded definitely nonmarine Wilcox assemblages. Sample D4137-A was poor, but did yield at least 6 specimens of the code species $P_3$-r27. This distinctive species is often present in Wilcox samples, but has never been seen below the Wilcox.

In general the samples I have designated as Porters Creek were very poor. They yielded a sparse pollen and spore flora and an abundant marine flora of hystrichospheres and dinoflagellates. Accompanying the fossils on the slides was an abundance of fine organic debris. Most of the pollen grains identified were also small (25 u or less). These two facts and the presence of marine forms suggests offshore marine deposition rather than nearshore or deltaic deposition.

Robert H. Tschudy

Robert H. Tschudy



RHK

REPORT ON REFERRED FOSSILS

KG-68-1D

Stratigraphic range: Eocene

Kinds of fossils: Palynomorphs

General locality: Kentucky

Quad. or area: Hickman quad.

Referred by: W. I. Finch

Shipment No.: KG-68-1D

Report prepared by: R. H. Tschudy
May 14, 1968

Date material received: Jan. 31, 1968

Status of work: Complete

---

Seven samples were submitted for palynological examination. All were productive of palynomorphs and were given USGS paleobotanical locality numbers as follows:

| Sample | Locality | Number |
|---|---|---|
| FHK-14 | Hickman Water Well No. 2; Kentucky coordinates 991,700-96,950, Hickman quad., Fulton Co., Kentucky; depth 437 feet | D4146-G |
| FHK-15 | Ditto; depth 457 feet | D4146-F |
| FHK-16 | Ditto; depth 487 feet | D4146-E |
| FHK-17 | Ditto; depth 517 feet | D4146-D |
| FHK-18 | Ditto; depth 547 feet | D4146-C |
| FHK-19 | Ditto; depth 577 feet | D4146-B |
| FHK-20 | Ditto; depth 664-667 feet; bit. | D4146-A |

The palynomorphs identified are listed on the accompanying chart.

| Sample / Number / Code species | FHK-14 D4146-G | FHK-15 D4146-F | FHK-16 D4146-E | FHK-17 D4146-D | FHK-18 D4146-C | FHK-19 D4146-B | FHK-20 D4146-A |
|---|---|---|---|---|---|---|---|
| Pœo-sm7B | X | | X | | | | |
| $BCP_3$-r (new) | X | | | | | | |
| $C_3$syn rt | X | X | X | | | | |
| Peltate leaf hair | X | X | X | | X | X | |
| $P_3$-sm 16 | X | X | X | X | X | | X |
| $BCP_3$-rt (fine reticulum) | X | | | | | | |
| An-16 | X | X | X | X | X | X | X |
| $C_3$-rt 36 | X | X | X | | X | | X |
| $CP_3$-sm5 | X | X | | X | X | | X |
| $CP_3$-sm34B | X | | | | | | |
| $CP_4$-sm2B | X | X | X | | | X | X |
| $CP_3$-r38 | X | X | | | | | |
| $BCP_3$-rt2 | X | | X | X | X | X | X |
| $C_3$-rt35 | X | | | | | | X |
| $P_3$-sm30C | X | X | X | | X | | X |
| $BCP_3$-rt3 | X | | X | X | X | | |
| $P_3$-sm56 | X | X | X | X | X | X | X |
| $CP_3$-rt 14 (34) | X | | | X | X | | |
| $BCP_3$-p 1 | X | X | | | | | X |
| Gothan 1 | X | X | X | X | | X | X |
| P -sm 109 | X | X | X | X | X | X | X |
| -sm 106B | X | X | X | X | X | | X |
| M-p8 | X | X | X | X | | | |
| $C_3$-rt23B | X | | | | | | |
| $P_3$-sp5 | | X | | | | X | |
| $CP_3$-sm 53 | | X | | X | | X | X |
| $C_3$-p20B | | X | X | | X | | |
| Pœo-sm3B | | X | | X | X | | |
| $C_3$-rt44 | | X | | | | | X |
| $P_4$-sm 1 | | X | | | X | X | X |
| $P_5$-foss 1 | | X | | | | | X |
| $C_3$-p4C | | X | | | | | |
| $C_3$-rt 16B | | X | X | X | | | X |
| C3-rt 16C | | X | | | | | |
| P œo-sm8 | | X | | | | X | |
| $CP_3$-r 47 | | X | | | | | X |
| $P_3$-sm98 | | X | X | | | | X |
| Tet-fov 2 | | | X | X | X | X | |
| $CP_3$-rt 19C | | | X | | | | |
| $P_4$-foss 1 | | | X | | | | |
| $CP_3$-rt 17B | | | X | | | X | X |
| M-p 16 | | | X | | X | | |
| $C_4$-sm 8 | | | X | | | | |
| Botryococcus | | | | X | | X | |

| Sample / Number / Code species | FHK-14 D4146-G | FHK-15 D4146-F | FHK-16 D4146-E | FHK-17 D3146-D | FHK-18 D4146-C | FHK-19 D4146-B | FHK-20 D4146-A |
|---|---|---|---|---|---|---|---|
| Schizocystia | | | | X | | | |
| $P_4$-sm 16 | | | | X | | | |
| $S_1$-sm5 | | | | X | | | |
| $CP_3$-r26 | | | | X | | | |
| $C_3$-rt40 | | | | X | | | |
| $C_3$-syn-r9 | | | | | X | | |
| $P_4$-sm2 | | | | | X | | |
| $P_3$-sm 16D | | | | | X | | |
| $P_6$-sp 1 | | | | | | ? | |
| $CP_3$-rt34 | | | | | | X | |
| Gn-7C | | | | | | X | |
| $P_4$-sm 5 | | | | | | X | |
| $S_1$-rt23 | | | | | | X | X |
| $CP_3$-r47 | | | | | | | X |
| $P_3$-sm72 | | | | | | | X |
| $P_3$-r 42 | | | | | | | X |
| $P_3$-rt3D | | | | | | | X |

All of the assemblages found clearly pertain to the upper Claiborne (Cockfield) or lower Jackson (Moodys Branch, Yazoo Clay). This interval is most difficult because the greatest palynological change takes place between the Sparta and Cockfield and not at the Claiborne-Jackson boundary. All samples are clearly post Spartan.

Our control material from the Cockfield and Cook Mountain yielded the same dominant species that are found as dominants in the Moodys Branch and Yazoo Clay. We have heretofore depended upon more or less rare species which are so far known only from the Jackson to distinguish the Jackson from the upper Claiborne. The paper by Engelhart (Bull. 104, Mississippi Geologic Survey, 1964) lists several of these rare species as common to the Claiborne (at variance with our control material). However, some other species that we consider to be limited to the Jackson were not listed in his Claiborne assemblage. It appears that we will have to reprocess our upper Claiborne samples in a further attempt to distinguish assemblages from this part of the section from overlying Jackson assemblages.

Especial attention was given to sample FHK-20, a sample from the bit. This sample also yielded species we consider characteristic of the Jackson. At present, I am forced to say that the assemblages all have a Jackson aspect. The samples other than FHK-20 were ditch samples and so could easily have become contaminated with Jackson material from up-hole positions. If contamination did occur, it was massive and general.

After the considerable work required to process and examine these samples, I am sorry that I could not write a more satisfactory report.

Robert H. Tschudy

R. H. Tschudy

RHT