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#16

June 7, 1979

TO: Husky/U. S. Geological Survey

RE: Husky/USGS, NPR-A
Ikpikpuk #1
Sec. 25, 13N/10W, U.B.M.
North Slope, Alaska

PALYNOLOGY REPORT

A total of 313 samples were processed and analyzed from the subject well. The total consists of 122 core samples, 33 sidewall cores, and 158 ditch samples composited for the most part into 90' intervals. The total section examined ranges from 100 feet to 14,210 feet total depth.

Included with this report are Figures 1 and 2 which illustrate the distribution of palynomorphs for ditch and sidewall cores, and conventional core samples, respectively. A summary of the findings is given below.

100-550'

Undifferentiated bisaccates (F-A), Camarozonosporites insignis (R), Cicatricosisporites annulatus (R), C. hallei (R), Cyathidites minor (R-A), Foraminisporis wonthaggiensis (R), Gleicheniidites senonicus (R-C), Lycopodiumsporites spp. (R), Neoraistrickia truncata (R), Ornamentifera echinata (R), Osmundacidites spp. (R-A), Stereisporites spp. (R), Taxodiaceae (R), Trilobosporites perverulentus (R), Triporoletes radiatus (R).

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100-550' (con't.)

Callaiosphaeridium asymmetricum (R), Canningia colliveri (R), Chatangiella magna (R), Chlamydophorella nyei (R), Coronifera oceanica (R), Cyclonephelium vannophorum (R), Exochosphaeridium bifidum (R), Hystrichodinium pulchum (R), H. voigti (R), Hystrichosphaeridium cooksonae (R), Isabelidinium cooksoniae (R), Kleithriasphaeridium eoinodes (R), Odontochitina costata (R), O. operculata (R), Oligosphaeridium anthophorum (R), O. complex (R), O. pulcherrimum (R), Palaeohystrichophora infusorioides (R), Palaeoperidinium cretaceum (R), Spiniferite cingulatus (R), S. ramosus (R-F), Xenascus ceratioides (R), Xiphophoridium alatum (R).

AGE: Late Cretaceous, Cenomanian (P-M16)
ENVIRONMENT: Marine

The interval above contains several taxa restricted to the Late Cretaceous, e.g., Chatangiella magna, Isabelidinium cooksoniae, Odontochitina costata, and Palaeohystrichophora infusorioides. The base is defined by the first appearance of Luxadinium propatulum which is considered to be Late Albian in age.

550-3440'

Araucariacites australis (R), undifferentiated bisaccates (R-A), Cerebropollenites mesozoicus (R), Cicatricosisporites hallei (R), Concavissimisporites spp. (R), Cyathidites minor (R), Distaltriangulisporites spp. (R), Gleicheniidites senonicus (R), Osmundacidites spp. (R),

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550-3440' (con't.)

Punctatosporites scabratus (R), Trilobosporites apiverrucatus (R), T. crassus (R), Vitreisporites pallidus (R).

Aptea polymorpha (R), Apteodinium reticulatum (R), Canningia colliveri (R), Chlamydophorella nyei (R), Cleistosphaeridium polypes (R), Cribroperidinium edwardsi (R), Cyclonephelium distinctum (R-F), Endoscrinium campanula (R), Exochosphaeridium cf. E. scitulum (R), Gardodinium trabeculosum (R), Genus "W" (R), Gonyaulacysta cretaceum (R), G. tenuiceras (R), Kleithriasphaeridium simplicispinum (R), Luxadinium propatulum (R), Odontochitina operculata (R), Oligosphaeridium complex (R), O. complex (thick wall)(R), Palaeoperidinium cretaceum (R-F), Pareodinia ceratophora (R), Pseudoceratium regium (R), P. cf. P. turneri (R), Spinidinium vestitum (R), Spiniferites ramosus (R), Trichodinium spinosum (R).

AGE: Early Cretaceous, Middle to Late Albian (P-M17)

ENVIRONMENT: Marine

This unit is defined by the first occurrence of Luxadinium propatulum and the last occurrence of Genus "W", both of which are restricted to sediments of Middle to Late Albian age. It also contains ?Epelidosphaerida spinosa and Spinidinium vestitum which are commonly known from Middle Albian and younger sediments. Taxa from this interval that are known from Albian and older sediments are the following: Gardodinium trabeculosum, Gonyaulacysta cretacea, Pareodinia ceratophora, Trilobosporites apiverrucatus, T. crassus, and Vitreisporites pallidus.

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3440-7360'

Araucariacites australis (R), undifferentiated bisaccates (R-A), Callialasporites dampieri (R), Camarozonosporites insignis (R), Cicatricosisporites australiensis (R), C. hallei (R), Cirratriradites teter (R), Classopollis classoides (R), Cyathidites minor (R), Densoisporites microrugulatus (R), Exesipollenites tumulus (R), Gleicheniidites senonicus (R), Lycopodiumsporites spp. (R), Osmundacidites spp. (R), Taxodeaceae (R).

Aptea polymorpha (R), Canningia colliveri (R), C. hirtella (R), Cribroperidinium edwardsi (R), Cyclonephelium compactum (R), C. distinctum (R), Endoceratium ludbrooki (R), Gardodinium trabeculosum (R), Muderongia tetracantha (R), Odontochitina operculata (R), Oligosphaeridium complex (R), O. complex (thick wall) (R), Palaeoperidinium cretaceum (R), Pareodinia ceratophora (R), Prionodinium alaskense (R, reworked?).

AGE: Early Cretaceous, Aptian to Early Albian (P-M18)

ENVIRONMENT: Marine to Marginal Marine

This unit is defined at the top by the base of Genus "W" as mentioned in the preceeding interval, and at the base by the first appearance of Neocomian fossils. Callialasporites dampieri which tops within this interval may be of significance since it is commonly believed to occur only in sediments of Middle Albian and older ages. Newly occurring dinoflagellates in this unit are rare and insignificant.

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7360-7450'

Araucariacites australis (R), undifferentiated bisaccates (R-A), Callialasporites dampieri (R), Cyathidites minor (R), Foraminisporis dailyi (R), Schizosporis parvus (R).

Canningia aspera (R), C. hirtella (R), Cleistosphaeridium ancoriferum (R), C. spp. (R-A), Gardodinium trabeculosum (R-A), Gonyaulacysta cretacea (R), G. hyalodermopsis (R), Hystrichosphaeridium recurvatum (R), Lithodinia spp. (R), Muderongia simplex (R), Odontochitina operculata (R-A), Oligosphaeridium complex (R-A), O. complex (thick wall) (R-A), O. totum (R), Pareodinia ceratophora (R), Palaeoperidinium cretaceum (R-A), Spiniferites spp. (R), Tanyosphaeridium boletum (R), T. variecalamum (R-C).

AGE: Early Cretaceous, Neocomian (P-M19)
ENVIRONMENT: Marine

This interval is best recognized in Core #5 (7360-7377') which contains a diverse assemblage of dinoflagellate cysts. Tanyosphaeridium boletum which occurs here is restricted to the Neocomian along with common to abundant occurrences of Oligosphaeridium complex, O. complex (thick wall), Gardodinium trabeculosum, Hystrichosphaeridium recurvatum, and Tanyosphaeridium variecalamum which are typical of the Neocomian.

Prionodinium alaskense which occurs in the sidewall core at 7142 feet may mark the top of the Neocomian section. However, no other data substantiates this until 7360 feet as

7360-7450' (con't.)

reported above. This fossil was also found reworked in Core #2 (3784-3812.7'), but not in place in the Neocomian interval. It is, therefore, interpreted to be erratic in distribution for this well.

7480-7840'

Araucariacites australis (R), undifferentiated bisaccates (A), Callialasporites dampieri (R), Cerebropollenites mesozoicus (R), Cicatricosisporites angicanalis (R), C. australiensis (R), Concavissimisporites spp. (R), Coronatisporites valdensis (R), Cyathidites minor (R), Gleicheniidites senonicus (R), Leptolepidites tenuis (R), Pilosisporites trichopapillosus (R), Trilobosporites hannonicus (R), Vitreisporites pallidus (R), Canningia hirtella (R), Cleistosphaeridium spp. (R), Cyclonephelium distinctum (R), Dingodinium cerviculum (R), Endoscrinium campanula (R-F), Gonyaulacysta cretacea (R), G. jurassica (R), G. tenuiceras (R), Oligosphaeridium anthophorum (R), O. complex (R-A), O. complex (thick wall) (R-F), Pareodinia ceratophora (R), P. dasyforma (R-A), Scriniodinium crystallinum (R).

AGE: Early Cretaceous, Neocomian (P-M20)
ENVIRONMENT: Marine

Recognition of this interval is based on the presence of the Early Neocomian index fossil Pareodinia dasyforma, and the abundance of Oligosphaeridium complex which is confined to rocks of Cretaceous age. These taxa are present both in the

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7480-7840' (con't.)

ditch samples and in Core #6 (7491-7501'). The spore taxa Cicatricosisporites angicanalis, Leptolepidites tenuis, and Trilobosporites hannonicus are also typical for the early Neocomian.

7840-8290'

Undifferentiated bisaccates (A), Cerebropollenites mesozoicus (R), Cingulatisporites reticingulus (R), Classopollis classoides (R), Cyathidites minor (R), Deltoidospora juncta (R), Exesipollenites tumulus (R), Gleicheniidites senonicus (R), Januasporites tumulosus (R), Plicatella abaca (R), Trilobosporites bernissartensis (R), T. canadensis (R).

Canningia hirtella (R), Cleistosphaeridium ancoriferum (R), C. spp. (R), Cribroperidinium edwardsi (R), Ctenidodinium panneum (R), Cyclonephelium distinctum (R), Endoscrinium campanula (R), Gardodinium trabeculosum (R), Gonyaulacysta cretacea (R), Odontochitina operculata (R-F), Oligosphaeridium complex (F-A), O. complex (thick wall) (R-F), Pareodinia borealis (R), P. ceratophora (R), P. dasyforma (R-F), Sirmiodinium grossi (R), Systematophora sp. B (R), Tenua rioulti (R), Tubotuberella apatela (R-F).

AGE: Late Jurassic, Kimmeridgian to Tithonian (P-M21)

ENVIRONMENT: Marine

The Late Jurassic is recognized here by Ctenidodinium panneum, Tenua rioulti, and Tubotuberella apatela.

7840-8290' (con't.)

Significant spore taxa occurring here are Januasporites tumulosus, Plicatella abaca, Trilobosporites bernissartensis and T. canadensis.

Occurrences of the following taxa are now considered to be "uphole" contamination: Cribroperidinium edwardsi, Gardodinium trabeculosum, Odontochitina operculata, Oligosphaeridium complex and O. complex (thick wall).

8290-9100'

Araucariacites australis (F), undifferentiated bisaccates (R-A), Kraeuselisporites sp. (R), Taxodiaceae (R), Tigrisporites reticulatus (R).

Cleistosphaeridium spp. (R-F), Ellipsoidictyum cinctum (R), Endoscrinium galeritum (R), E. luridum (R), Gonyaulacysta cladophora (R-F), Leptodinium cf. L. eumorphum (R), L. subtile (R), Nannoceratopsis gracilis (R), N. pellucida (R-F), Pareodinia ceratophora (R), P. dasyforma (R), P. osmingtonensis (R), Scriniocassis dictyota (R), Scriniodinium crystallinum (R), Tenua rioulti (R), Tubotuberella apatela (R), Wanea sp. (R).

AGE: Late Jurassic, Oxfordian (P-M22)
ENVIRONMENT: Marine

Important taxa for the Oxfordian interval are the following: Endoscrinium galeritum, E. luridum,

8290-9100' (con't.)

Gonyaulacysta cladophora, Nannoceratopsis gracilis, N. pellucida, Scriniocassis dictyota, and Wanea sp.

9100-9730'

Undifferentiated bisaccates (R-A).

Ctenidodinium ornatum (R), Endoscrinium galeritum (R), Gonyaulacysta cladophora (R), Nannoceratopsis gracilis (R-F), N. pellucida (R-C), N. senex (R), Pareodina dasyforma (R-F), Scriniodinium crystallinum (R).

AGE: Early to Middle Jurassic (P-M23)
ENVIRONMENT: Marine

Early to Middle Jurassic is here recognized by the reappearance of Nannoceratopsis spp., especially N. gracilis and N. senex.

9730-10,740'

Undifferentiated bisaccates (R-A).

AGE: Indeterminate
ENVIRONMENT: Indeterminate

Taxa from this interval are mostly rare and scattered in distribution. Many are apparently from "uphole" contamination.

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10,740-11,830'

Aculeisporites sp. (R), Anaplanisporites stipulatus (R), Apiculatisporis lanjouwii (R), A. spp. (R-F), Aratrisporites sp. (R-F), undifferentiated bisaccates (R-C), Deltoidospora spp. (R), Densosporites spp. (R), Dictyotriletes sp. (R), Dulhuntyspora minuta (R), Endosporites sp. (R), Kraeuselisporites spp. (R-F), Lycospora spp. (R), Punctatisporites sp. (R-C), Ricciisporites sp. (R), Striatites richteri (R-A), Taeniaesporites spp. (R-F), Tsugaepollenites jonkeri (R), undifferentiated verrucate spores (R-A), Vitreisporites pallidus (R), Vittatina sp. (R).

AGE: Permian to Triassic, undifferentiated
ENVIRONMENT: Nonmarine to Marginal Marine

Occurrences of Kraeuselisporites spp., Aratrisporites sp., Anaplanisporites stipulatus, and Taeniaesporites spp. near the top of this unit and in Core #9 (10,815-10,842') suggest a Triassic age. The presence of Vittatina sp. at the base indicates Permian. No taxa between these two points suggest an age more specific than Permian to Triassic.

11,830-13,020'

Anaplanisporites stipulatus (R), Aratrisporites sp. (R), Apiculatisporis spp. (R), undifferentiated bisaccates (R-F), Densosporites spp. (R), Endosporites sp. (R), Klausipollenites staplini (R), Kraeuselisporites spp. (R), ?Lundbladispora sp. (R), Lycospora spp. (R), Punctatisporites spp. (R),

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11,830-13,020' (con't.)

Striatites richteri (R), Taeniaesporites spp. (R), undifferentiated verrucate spores.

AGE: Indeterminate
ENVIRONMENT: Indeterminate

The taxa found in this interval remain similar to those in the preceeding Permian to Triassic section, with the addition of no significant new forms. The age here is left indeterminate in order to accomodate the Foraminifera evidence which indicates Pennsylvanian at 11,830 feet.

13,020-13,380'

Apiculatisporis spp. (R), undifferentiated bisaccates (R), Calamospora (R), Cirratriradites (R), Densosporites spp. (R), Endosporites sp. (R), Florinites sp. (R), Lycospora spp. (F-C), Potoniesporites (R), Punctatisporites (R), Schopfipollenites sp. (R).

AGE: Pennsylvanian (P-T19)
ENVIRONMENT: Nonmarine to Marginal Marine

Based on the frequent to common occurrences of Lycospora sp. the persistent distribution of Punctatisporites spp., and the presence of Florinites sp., Potoniesporites sp., and Schopfipollenites sp., this interval can be dated as Pennsylvanian in age.

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13,380-14,210'T.D.

Undifferentiated bisaccates (R), Endosporites sp. (R), Lycospora spp. (R-C), Punctatisporites (R-C), Pustulatisporites sp. (R), Raistrickia sp. (R), Reticulatisporites sp. (R), Spinozonotriletes sp. (R).

AGE: Carboniferous undifferentiated
ENVIRONMENT: Nonmarine to Marginal Marine

None of the taxa restricted to the Pennsylvanian remain persistent through this unit. More generalized species such as Endosporites sp., Lycospora spp., Punctatisporites spp., and Raistrickia sp. do remain however, and the interval is, therefore, dated as Carboniferous undifferentiated.

Interpreted by:

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