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MEMORANDUM NO. 2109

BIOSTRATIGRAPHIC ANALYSIS OF 14 SIDEWALL

CORES FROM THE NORSK HYDRO 30/7-2

NORWEGIAN NORTH SEA WELL

ROBERTSON RESEARCH GROUP

ROBERTSON RESEARCH INTERNATIONAL LIMITED

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NORWEGIAN NORTH SEA WELL

Project No. IIA/756/1494

Under Project No. IIA/756/1494 a total of 14 sidewall cores were submitted for analysis. All 14 samples were treated both micropalaeontologically and palynologically. Twelve of the samples contained dinoflagellates whilst only eight samples contained any microfaunas and only three of the latter contained significant numbers of microfossils.

agreed!
It should be stressed at the outset that the samples submitted for analysis were of very small size and it was not always possible to ascertain whether the samples were free from contamination. This fact should be noted especially since no log or other information was made available and in a few samples anomalous results were obtained, this either being due to contamination or reworking.

The summary of the breakdown based on the biostratigraphical analyses carried out is given below, followed by full details of each sample analysed.

1746.5m	Indeterminate
1825m - 1963.5m	Lower Eocene - Upper Palaeocene
2034m - 2127m	Upper Palaeocene
2152m - 2254m	Palaeocene
2275m	Lower Palaeocene
2341m - 2360m	Danian, Lower Palaeocene
2386m	Maastrichtian - Campanian, Upper Cretaceous
2556.5m	Cretaceous

SWC No. 58 - 1746.5m; Indeterminate

Quality - Fair/good.

Lithology

SHALE, firm, medium grey, waxy, non-calcareous.

Biostratigraphy

Both dinoflagellates and foraminifera were absent from this sample.

SWC No. 57 - 1825m; Lower Eocene - Upper Palaeocene

Quality - Poor.

Lithology

SANDSTONE, soft, light grey, fine to coarse, angular to subangular, slightly micaceous, non-calcareous.

Biostratigraphy

Floral List

Spiniferites ramosus ramosus

Areoligera senonensis

Ceratiopsis diebeli

This sample was again devoid of foraminifera but did contain a limited microflora. The forms present, i. e. Ceratiopsis diebeli would favour an Upper Palaeocene age (See however comment on SWC No. 49).

SWC No. 49 - 1957.5m; Lower Eocene - Upper Palaeocene

Quality - Fair.

Lithology

SANDSTONE, soft, light grey, fine to medium, angular to subrounded, micaceous, non-calcareous, oil odour.

Biostratigraphy

Floral List

✓ Deflandrea phosphoritica phosphoritica

Spiniferites ramosus ramosus

Homotryblum tenuiprocessus

Thalassiphora pelagica

Wetzeliella (Wetzeliella) articulata

Hystrichosphaeridium tubiferum

Hystrichosphaeridium sp.

Spiniferites ramosus gracilis

Cordosphaeridium inodes

Wetzeliella (Apectodinium) hyperacantha

This sample was barren of microfossils.

The presence of W. (A.) hyperacantha would suggest that this sample is of Upper Palaeocene age. However, in this sample it is associated with species which are more characteristic of the London Clay (Ypresian) in S.E. England.

Thalassiphora pelagica, Wetzeliella (W.) articulata and Homotryblum tenuiprocessus in particular would suggest that this sample, if these forms are not contaminants, could be assigned to the very base of the Eocene.

We have therefore assigned a Lower Eocene to Upper Palaeocene age to both this sample and the sample at 1825m.

SWC No. 47 - 1963.5m; Lower Eocene - Upper Palaeocene

Quality - Fair.

Lithology

SANDSTONE, friable, argillaceous, poorly sorted, fine, occasionally medium angular, micaceous, non-calcareous.

Biostratigraphy

Floral List

Spiniferites ramosus ramosus

No microfauna was recovered from this sample.

A single specimen of this long ranging dinoflagellate was recorded. Because of the conflicting evidence in the overlying sample it has only been possible to assign a Lower Eocene - Upper Palaeocene age to this sample.

SWC No. 41 - 2034m; Upper Palaeocene

Quality - Fair.

Lithology

SHALE, firm, medium grey, non-calcareous.

Biostratigraphy

Floral List

Ceratiopsis diebeli

Palaeocystodinium golzowense

The presence of C. diebeli without any conflicting evidence would indicate that this sample is of Upper Palaeocene age.

No microfossils were recovered from this sample.

SWC No. 34 - 2127m; Upper Palaeocene

Quality - Fair.

Lithology

SHALE, firm, medium grey, silty, micaceous, non-calcareous.

Biostratigraphy

Floral List

Adnatosphaeridium patulum

Polysphaeridium spp.

Hystriosphæridium sp.

Wetziella (Apectodinium) hyperacantha

W. (A.) parva

W. (A.) homomorpha homomorpha

Spiniferites ramosus ramosus

Cleistosphaeridium disjunctum

Faunal List

Bathysiphon eocenicus

An Upper Palaeocene age is again indicated for this sample on the basis of the presence of Wetzeliella (A.) hyperacantha.

SWC No. 33 - 2152m; Palaeocene

Quality - Fair.

Lithology

SHALE, firm, medium grey, waxy, non-calcareous.

Biostratigraphy

Faunal List

Glomospira charoides

This sample proved to be devoid of any dinoflagellates and only contained the long ranging foraminifera Glomospira charoides. Solely on its stratigraphic position a general Palaeocene age is assigned to this sample.

SWC No. 27 - 2254m; Palaeocene

Quality - Poor.

Lithology

SHALE, earthy, light grey-brown, very silty and sandy, micaceous, calcareous.

Biostratigraphy

Floral List

Deflandrea phosphoritica phosphoritica

Oligosphaeridium complex

Cordosphaeridium fibrospinosum

Polysphaeridium spp.

Tanyosphaeridium ? magdaliium

Cyclonephelium ordinatum

Hystrichokolpoma cinctum

?Areoligera sp. nov.

Hystrichosphaeridium tubiferum

Gonyaulacysta sp.

Spiniferites pseudofurcatus

Palaeocystodinium golzowense

Spiniferites ramosus ramosus

Lejeunia hyalina

Homotryblidium pallidum

Wetzeliella spp.

Renidium membraniferum

Danea mutabilis

Cordosphaeridium cf. divergens

Faunal List

Sponge spicules

Radiolaria

The microfauna is rather impoverished and only consists of sponge spicules and radiolaria. No age can therefore be assigned on the basis of the microfaunal elements. The continued presence of the genus Wetzeliella would signify that this sidewall core is still of Upper Palaeocene age. There are however, several new elements in this sample including forms typical of the Lower Palaeocene. These include D. mutabilis, T. ?magdaliium and R. membraniferum.

The species of Wetzeliella may be contaminants while on the other hand the Lower Palaeocene species present may be reworked, since reworking of Danian and Cretaceous forms into younger Palaeocene deposits is a common feature in certain areas of the northern North Sea.

We have therefore, because of the conflicting evidence, only assigned a general Palaeocene age to this sample.

SWC No. 27A - 2254m; Palaeocene

Quality - Poor/fair.

Lithology

SHALE, earthy, light grey, slightly silty, non-calcareous.

Biostratigraphy

Floral List

Cyclonephelium divaricatum (common)

Cyclonephelium sp.

Areoligera coronata

Gonyaulacysta aff. tenuitabulata

Palaeoperidinium pyrophorum

Deflandrea sp.

Spiniferites pseudofurcatus

Faunal List

Bathysiphon eocenicus

In view of the fact that this sample and the one marked 27 are from the same depth a general Palaeocene age is assigned. The presence of P. pyrophorum if in situ would, however, indicate that this sample is of Lower Palaeocene age.

SWC No. 26 - 2275m; Lower Palaeocene

Quality - Fair.

Lithology

ARGILLACEOUS SANDSTONE, friable, light greenish grey, poorly sorted, fine to coarse, angular to subrounded, porous, non-calcareous.

Biostratigraphy

Floral List

Gonyaulacysta sp.

Palaeoperidinium pyrophorum

Palaeocystodinium golzowense

Lejeunia hyalina

Deflandrea sp.

Areoligera coronata

Faunal List

Bathysiphon eocenicus

Only long ranging foraminifera were recovered from this sample. The presence, however, of P. pyrophorum with no conflicting evidence would indicate a Lower Palaeocene age for this sidewall core.

SWC No. 23 - 2341m; Danian, Lower Palaeocene

Quality - Poor.

Lithology

SANDSTONE, friable, light cream-grey, fine-grained, angular, micaceous, glauconitic.

Biostratigraphy

Floral List

Areoligera coronata

Cyclonephelium sp.

Spiniferites ramosus gracilis

Lejeunia hyalina

Polysphaeridium cf. subtile

Adnatosphaeridium sp.

Areoligera senonensis

Deflandrea sp.

Cordosphaeridium fibrospinum

Deflandrea phosphoritica phosphoritica

Spiniferites ramosus ramosus

Faunal List

Globigerina triloculinoides

Globigerina pseudobulloides

Globoconusa daubjergensis

The microfaunal association present here suggests a Danian age for this sample. Although no diagnostic marker dinoflagellate species for the Danian are found the general microfloral assemblage would again suggests a general Lower Palaeocene age.

SWC No. 21 - 2360m; Danian, Lower Palaeocene

Quality - Poor.

Lithology -

LIMESTONE, firm, light cream-grey, argillaceous silty, micaceous.

Biostratigraphy

Floral List

Areoligera senonensis ×

Areoligera coronata

Faunal List

Globigerina triloculinoides ✓

Globigerina pseudobulloides ✓

Globigerina danica

Globoconusa daubjergensis

Pseudotextularia elegans elegans (Reworked)

A rich microfauna dominated by planktonic foraminifera was recovered from this sidewall core. The species present confirm a Danian age. A single specimen of a reworked Maastrichtian species, Pseudotextularia elegans elegans, was also found.

The microflora recovered was too sparse for any age determinations to be assigned.

SWC No. 19 - 2386m; Maastrichtian - Campanian, Upper Cretaceous

Quality - Fair/poor.

Lithology

SHALE, firm to earthy, light to medium grey, calcareous

Biostratigraphy

Floral List

Spiniferites pseudofurcatus

Palaeoperidinium pyrophorum

Spiniferites cingulatus

Oligosphaeridium complex

Spiniferites ramosus gracilis

Gonyaulacysta sp.

Baltisphaeridium whitei

Faunal List

Heterohelix spp.

Rugoglobigerina rugosa rugosa (common)

Eponides spp.

Gavelinella vombensis

Praebulimina sp.

Globigerinelloides asper

Gyroidina sp.

Lagena sp.

Globigerina pseudobulloides (contaminant?)

A rich microfauna was recovered from this sample and apart for a single specimen of Danian species, which is assumed to be a contaminant, all the species are characteristic of the Upper Cretaceous. Although no diagnostic marker species are present the general assemblage suggests a general questionable Maastrichtian - Campanian age.

Most of the dinoflagellate species present are long ranging forms, but the occurrence of B. whitei and P. pyrophorum also suggests a Maastrichtian - Campanian age.

SWC No. 7 - 2556.5m; Cretaceous

Quality - Fair/poor.

Lithology

SHALE, firm, waxy, medium greenish grey, non-calcareous.

Biostratigraphy

Floral List

Hystriosphæridium tubiferum

Achomosphaera ramulifera

Polysphaeridium sp.

Homotryblum pallidum

Deflandrea aff. phosphoritica

Exochosphaeridium bifidum

Most of the dinoflagellates in this sample are long-ranging forms, but the occurrence of E. bifidum suggests an age within the range Campanian to Albian therefore a general Cretaceous age has been assigned.

The sample was devoid of any microfossils.

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