TECHNICAL REPORT

Stratigraphy Series

Report WH/89/15R

Ammonite from Marine Geology R.G.'s
Borehole 88/6 (Little Minch)

B M Cox

Biostratigraphy Research Group Report PD 89/15

Geographical Index

Offshore sheet 57/-08
(Little Minch)

Subject Index
Jurassic
Bajocian
Macropalaeontology
Lithostratigraphy, Chronostratigraphy,
Biostratigraphy

Keyworth, Nottinghamshire  British Geological Survey
Ammonite from Marine Geology R.G.'s Borehole 88/6 (Little Minch)

For ease of reference and at the request of Martyn Stoker, the recent correspondence and subsequent report of Nicol Morton (Birkbeck College, University of London) on the ammonite recovered from Borehole 88/6 in the Little Minch have been brought together and are now issued as a PD report in the Biostratigraphy R.G.'s regular series.

B M Cox
17th January 1989
Dear Martyn

Borehole 88/6: ammonite from 28.35m

I have developed out the ammonite specimen from your Borehole 88/6 (specimen nos CSC 7590-1) and suggest that it is a *Garantiana* from the Upper Bajocian. I would be looking towards the Garantiana Clay of Skye and Raasay as a possible horizon. However, as I do not have first-hand experience at this stratigraphic level, I intend to send the specimens to Dr Nicol Morton at Birkbeck College, University of London who is an expert on the stratigraphy and ammonite faunas of the Middle Jurassic of the Inner Hebrides (viz. Morton 1976 Bajocian (Jurassic) stratigraphy in Skye, Western Scotland *Scott.J.Geol.*,12, 23-33 and various papers in *Palaeontology* et al.).

I shall suggest to him that he contacts you direct with any matters arising.

With best wishes

Yours sincerely

[Signature]

Bemi Cox
Biostratigraphy Research Group
Dear Nicol

An unexpected interval of Jurassic mudstones has been cored in one of our Marine Geology Research Group's boreholes in the Little Mineh (Borehole no. 86/6). This has yielded a single ammonite specimen from a depth of 26.35m. My impression is that it is a Garantiana from the Upper Majocian. However, as I have no first-hand experience at this stratigraphic level, I think it would be beneficial, and maybe of interest for your own researches, if you examined the specimen.

If you are interested in doing this, perhaps you could let me know and I will send all the details and the specimen by "registered" post.

Yours sincerely

Dr Beris Cox
Biostratigraphy Research Group

A component body of the Natural Environment Research Council
Dear Nicol

Please find enclosed the ammonite from the BGS Marine Geology Research Group's Borehole 88/6 in the Little Minch (specimen nos CSC 7590-7591). Also enclosed is a sheet showing the borehole details. Please liaise with Dr Martyn Stoker of the Marine Geology R.G. at Murchison House, West Mains Road, Edinburgh, EH9 3LA; tel. 031-667-1000.

I enclose a couple of reprints with some North Sea interest and will contact you again when I have traced Stewart Brown's Brent Group ammonite which I am alleged to have 'identified'.

With best wishes for the New Year,
Yours sincerely

Berla Cox

cc. Dr Martyn Stoker
## BRITISH GEOLOGICAL SURVEY
### Marine Geology Research Programme

#### Proposed site no 341

<table>
<thead>
<tr>
<th><strong>Latitude:</strong></th>
<th>57° 42.198'N</th>
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</thead>
<tbody>
<tr>
<td><strong>Longitude:</strong></td>
<td>6° 51.987'W</td>
</tr>
<tr>
<td><strong>Location:</strong></td>
<td>6.6km SE of Renish Point, Harris</td>
</tr>
<tr>
<td><strong>Map area:</strong></td>
<td>Little Minch</td>
</tr>
<tr>
<td><strong>Block no:</strong></td>
<td>Landward area</td>
</tr>
<tr>
<td><strong>Geologist:</strong></td>
<td>D. Evans M.S. Stoker</td>
</tr>
<tr>
<td><strong>Water depth:</strong></td>
<td>120m</td>
</tr>
<tr>
<td><strong>Drift cored:</strong></td>
<td>23.50m</td>
</tr>
<tr>
<td><strong>Recovered:</strong></td>
<td>2.10m (8.9%)</td>
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<tr>
<td><strong>Solid cored:</strong></td>
<td>7.00m</td>
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<tr>
<td><strong>Recovered:</strong></td>
<td>6.65m (95%)</td>
</tr>
<tr>
<td><strong>Total cored:</strong></td>
<td>30.50m</td>
</tr>
<tr>
<td><strong>Recovered:</strong></td>
<td>8.75m (28.7%)</td>
</tr>
<tr>
<td><strong>Logging:</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

### Notes:

This borehole was planned to investigate the possibility of Carboniferous sediments at or near to outcrop in the Minch Basin. The Quaternary cover proved to be thicker than expected and rockhead was reached at 23.5m where Jurassic mudstone was drilled.

### Geological Summary

<table>
<thead>
<tr>
<th><strong>AGE</strong></th>
<th><strong>DEPTH (m)</strong></th>
<th><strong>RECOVERY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

### Sample Description

- **Diatomite, massive, matrix-to-clay supported, shell, moderately calcium blank, monosulphide streaks, give H2S odour, very soft to firm, dark olive-grey.**
- **Mudstone, calcareous, nodular, ammonite and other shell debris, disseminated pyrite, hard, concho-dolomite, very dark grey to black.**

**Ammonite at 28.15m**
copy to
Dr. Beris Cox,
BGS Biostratigraphy Group,
Keyworth.

Baris,

Holtby to confirm your identification. Breaking the specimen out from the core proved it to be quite a reasonably well preserved, by Roman times very advanced.

Best wishes,
Mceol.
Report on fossils from B.G.S. Marine Geology Group Borehole 88/6

Samples CSC 7590/7591

These two samples overlap and are counterparts so represent about 5 cm of sequence. They have been broken up by me to extract the fossils which were visible and to see what others could be found. Individual fossils and rock fragments have been numbered to retain the original distinction into two samples, but there are no differences between the samples so that this report deals with both together.

Apart from fish scale and bone fragments and coprolites which appear to occur throughout, the macrofossils found include:

1. One moderately large ammonite fragment, mainly crushed but with part of the body chamber preserved uncrushed in a nodule. It is evolute with thick round whorl cross-section, sharp distant primary ribs (c. 10 per quarter whorl) which are slightly flexed and branch at small tubercles on the middle of the whorl sides into two equally sharp secondary ribs which are straight but slightly prospiradate towards the venter. There are pointed tubercles on each secondary rib at the ventral shoulder, and the ribs fade from these onto the venter which is broad, flat and with a central smooth band where the ribs do not cross from one side to the other. This specimen has been identified as Garantiana (Garantiana) aff. garantiana (d'Urbigny) (macroconch) and can be matched with specimens from the Garantiana Clay Member on Raasay (Dietl & Morton MS submitted to Scott. J. Geol.). The age is the lower part of the Garantiana Zone, Upper Bajocian (almost certainly Dichotoma Subzone).

2. One indeterminate ammonite fragment (in CSC 7590).
3. Several specimens of a small globose bivalve. One well preserved specimen with shell and internal and external moulds was recovered (in CSC 7591) and is identified as *Nuculana variabilis* (Sowerby). This nuculid is a shallow burrowing deposit feeder and is typical of environments with high sedimentation rates in which high organic content may result in reduced levels of oxygen availability in the sediment.

4. Two or three specimens of a larger bivalve occur in both samples. This is almost certainly a *Retroceramus* sp., but I don't know which species. One specimen (in CSC 7590) appears to have both valves present but displaced relative to each other. This is an epifaunal bivalve which is characteristically Boreal in its distribution.

5. One fragment of an indeterminable elongate bivalve with concentric ornament indicated the presence of a third species.

The lithology and especially the ammonite identify this piece of core as being from the Upper Beajocian Garantiana Clay Member of the Bearreraig Sandstone Formation. If all 7 m of mudstone reported in the borehole belong to the Garantiana Clay then this unit is thicker in 88/6 than at outcrop, but the upper part could be from the Culleidh Shale Formation of the Great Estuarine Group. I note that 6.65 m of core were recovered, and further examination of this should be informative.

It is a pity that the borehole did not go slightly deeper, to penetrate the uppermost part of the Bearreraig Sandstone Formation. At outcrop this formation is very variable in thickness and facies, as a classic marine synrift sequence. It would have been very informative to know the lithological character so near to the western margin of the Hebrides Basin, for example whether there would be evidence for a western, Lewisian, source.

Nicol Morton.

Dr. Martyn Stoker.

B.G.S. Marine Geology Group.

Edinburgh.