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Calcareous microfossils from laminated clay in an M1 cutting near Enderby Grange, Leicestershire

Internal Report IR/03/164

BRITISH GEOLOGICAL SURVEY

INTERNAL REPORT IR/03/164

Calcareous microfossils from laminated clay in an M1 cutting near Enderby Grange, Leicestershire

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Summary

Laminated clay, which on field evidence was considered to be of Pleistocene age, contained marine and brackish marine microfossils reworked from the Triassic-lower Jurassic, Upper Cretaceous and Quaternary. Fresh water ostracods or diatoms were no observed.

1 Introduction.

Whilst co-ordinating the palaeontological data in order to produce a palaeontological data set for the Leicester sheet (1:50K sheet 156) (WILKINSON, 2003) a sample (EGP8955) described as a 'laminated clay from below Chalky Boulder Clay and overlying glacial gravel', came to light (Register 90, page 36). The sample had been collected from the M1 cutting c.137m West of Enderby Grange and 640m E of Cailton Hayes Hospital (National Grid Reference SP 5438 9852). The register notes the presence of ostracods in the sample and a Pleistocene age was given to it. The implication is that the laminated clay represents a lacustrine or fluvial deposit and that the microfauna was *in situ*. However, the fauna examined comprises entirely reworked marine and brackish marine species.

2 Faunal list

2.1 LATE TRIASSIC-EARLY JURASSIC:

Foraminifera- *Eoguttulina* sp
Lingulina tenera tenera
 Ostracoda- *Ogmoconcha* sp

2.2 LATE CRETACEOUS:

Foraminifera- *Bolivinooides culverensis*
Loxostomum eleyi
Gyroidinooides nitidus
Dicarinella canaliculata
Osangularia cordieriana
Stensioeina sp
Reusella szajnochae praecursor
Marssonella trochus
Stensioeina exsculpta exsculpta
Stensioeina granulata incondita
Whiteinella archaeocretacea

2.3 QUATERNARY:

Foraminifera- *Elphidium* sp
Buccella frigida
 ?*Haynesina orbiculare*

3 Conclusions

The microfauna shows evidence of three ages.

The Rhaetic to early Jurassic is indicated by the presence of *Ogmoconcha* sp and *Lingulina tenera tenera*. These are long ranging taxa which are unlikely to be younger than the early Toarcian.

The late Cretaceous assemblage dominates the fauna and includes *Bolivinoidea culverensis*, a species indicative of the upper part of the *angulata* to *quadrata* macrofaunal zones (Lower and Middle Campanian). In terms of the lithostratigraphy of southern England, this species appears in the lower (but not basal) part of the Newhaven Chalk Formation and extends into the Culver Chalk Formation. *Stensioeina exsculpta exsculpta* became extinct in the basal *pilula* zone and is characteristic of the foraminiferal assemblages in the Seaford Chalk Formation and the lower part of the Newhaven Chalk Formation. The only part of the succession where both species are found together is in foraminiferal zone BGS19, which equates with the basal *pilula* zone, i.e. lower but not basal Newhaven Chalk.

The Quaternary element of the fauna is very minor. The Foraminifera listed above indicate cold waters and are derived from brackish to brackish marine water conditions, and are presumably derived from the North Sea. Had the sample represented a Pleistocene lacustrine or fluvial environment, fresh water ostracods and diatoms would have been expected. None was observed. There is no evidence, therefore, that the laminated clay is a fresh water deposit. However, on the basis of the Quaternary foraminifera, and despite the fact that they are reworked, the Pleistocene age assigned to the deposit is not unreasonable.

4 References

WILKINSON, I P 2000. A preliminary foraminiferal biozonation of the Chalk Group (In preparation for the Holostrat Project: Upper Cretaceous). *Internal Report of the British Geological Survey*, IR/00/13, 21pp.

WILKINSON, I P 2003. A data-base of palaeontological results pertaining to the Leicester Sheet (1:50K sheet 156). *Internal Report of the British Geological Survey*, IR/03/165, 21pp.