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# Biostratigraphical analysis of a suite of Chalk samples from the Devizes district

Internal Report IR/04/146



BRITISH GEOLOGICAL SURVEY

INTERNAL REPORT IR/04/146

# Biostratigraphical analysis of a suite of Chalk samples from the Devizes district

Ian P. Wilkinson

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## Summary

Biostratigraphical analysis of a suite of samples from the Devizes district shows that the assemblages fall within foraminifera zones BGS13 to BGS15 and BGS17 to BGS18 (BGS16 was not recognised). The foraminifera can be used to correlate the samples with the Upper Lewes Nodular Chalk, Seaford Chalk and basal Newhaven Chalk formations

# 1 Introduction

Foraminifera from a suite of 19 samples of chalk from the Devizes district were examined in order to determine their biostratigraphical position. Assemblages are related to the zonal scheme outlined by Wilkinson (2000).

## 2 Foraminiferal analysis

Selected species only are discussed herein. The full fauna for each sample is held in the biostratigraphical files of the BGS, Nottingham.

### 2.1 MPA53095 PMH3783 ST 94852 44292

*Verneuilina muensteri*  
*Gavelinella tourainensis*  
*Gavelinella pertusa*

The presence of the above species and the absence of *Osangularia cordieriana* and *Stensioeina* spp places the assemblage into foraminiferal zone BGS13 (approximately equivalent to the *cortestudinarium* macrofaunal zone). The occurrence of *Gavelinella pertusa* suggests the upper part of the foraminiferal Zone. Elsewhere in southern England, this assemblage has been recorded below the East Cliff Marls (and lateral equivalents) in the upper Lewes Nodular Chalk.

### 2.2 MPA53098 PMH3786 ST 96365 43442

Foraminifera are very rare, poorly preserved, long ranging and of little biostratigraphical worth. A questionable fragmentary specimen of ?*Gavelinella tourainensis* was observed and, if correctly identified, indicates an age no younger than BGS13 (*cortestudinarium* macrofaunal Zone). Of the remaining species, *Valvulineria lenticularis* indicates an age no older than BGS9 (within the *Mytiloides* macrofaunal zone). No further biostratigraphical conclusions can be drawn.

### 2.3 MPA53104 PMH3792 ST 97553 45640

*Stensioeina polonica*  
*Lingulogavelinella arnagerensis*

The concurrent range of these two species is foraminiferal subzone BGS17i (within the *coranguinum* macrofaunal zone). Elsewhere in southern England, this subzone is confined to the succession between the Chartham Flint and immediately above Whitakers 3" Flint (and lateral equivalents) within the 'middle' part of the Seaford Chalk Formation.

### 2.4 MPA53112 PMH3800 ST 98464 44236

*Globotruncana bulloides*  
?*Gavelinella tourainensis*

Mainly long ranging foraminifera were found in the sample, and of little biostratigraphical importance. However, the inception of *Globotruncana bulloides* is within the upper part of foraminiferal zone BGS13 (= upper part of the *cortestudinarium* Zone). The specimen tentatively assigned to *G tourainensis*, if correctly identified, places the fauna below the top of BGS13 (= top *cortestudinarium*) at which horizon it becomes extinct. Correlation with the upper Lewes Nodular Chalk is tentatively suggested.

## 2.5 MPA53113 PMH3801 ST 98148 44326

*Verneuilina muensteri*  
*Gavelinella tourainensis*  
*Neoflabellina praerugosa*  
*Globotruncana bulloides*  
*Osangularia cordieriana*  
*Gavelinella thalmani*

The inception of *Verneuilina muensteri* and *Neoflabellina praerugosa* indicate an age no older than Foraminiferal zone BGS13. *Globotruncana bulloides* first appears in the upper part of the same foraminiferal zone, but then has a long range. *Gavelinella tourainensis* disappears from the record at or near the top of BGS13. The concurrent range of these taxa indicate the upper part of BGS13 in the Upper Lewes Chalk Formation. *Osangularia cordieriana* and *Gavelinella thalmani*, however, first enter the record at the East Cliff Marls (and lateral equivalents), in the highest part of BGS13 (uppermost *cortestudinarium* macrofaunal Zone). The very highest Lewis Chalk Formation is inferred.

## 2.6 MPA53114 PMH3802 ST 98147 44451

*Stensioeina granulata granulata*  
*Lingulogavelinella arnagerensis*

The fauna is essentially similar to BGS 13, but a single specimen of *S granulata granulata* is used to suggest BGS14 (=basal *coranguinum* macrofaunal zone) and there is no evidence of BGS15 and 16 (which would be characterised by the presence of *Stensioeina exsculpta exsculpta* and *Loxostomum eleyi* respectively). *Lingulogavelinella arnagerensis* is immediately above Whitaker's 3" Flint. Correlation with the basal Seaford Chalk, elsewhere in southern England, is possible.

## 2.7 MPA53117 PMH3805 ST 98719 46999

*Reussella kelleri*,  
*Verneuilina muensteri*  
*Lingulogavelinella arnagerensis*  
*Gavelinella tourainensis*  
*Osangularia cordieriana*  
*Globorotalites michelinianus*

The concurrent range of *Verneuilina muensteri* and *Gavelinella tourainensis* indicates foraminiferal zone BGS13 (= *cortestudinarium* macrofaunal zone) and the occurrence of rare specimens of *Osangularia cordieriana* suggests a position at the East Cliff Marls (and lateral equivalents). The absence of *Stensioeina* suggests a position below BGS14. This compares with the faunas recorded from the Upper Lewes Nodular Chalk elsewhere in southern England.

**2.8 MPA53118 PMH3806 ST 98999 47508**

*Osangularia cordieriana*  
*Lingulogavelinella arnagerensis*  
*Reussella kelleri*  
*Gavelinella pertusa*  
*Verneuilina muensteri*

The fauna listed is indicative of the upper part of foraminiferal Zone BGS13 (Upper *cortestudinarium* macrofaunal zone) at the level of the East Cliff Marls. There are no specimens of *Stensioeina*, indicators of BGS14 and BGS15. A position in the uppermost Lewis Nodular Chalk is suggested by comparison with other localities in southern England.

**2.9 MPA53119 PMH3807 ST 99041 44343**

*Stensioeina granulata granulata*  
*Osangularia cordieriana*

The presence of the two species listed, indicates foraminiferal zone BGS14. Indicators of higher zones, such as *Stensioeina exsculpta exsculpta* or *Loxostomum eleyi* were not encountered. BGS14 (= base *coranguinum* macrofaunal Zone) at the base of the Seaford Chalk is inferred.

**2.10 MPA53120 PMH3808 ST 99599 43893**

*Stensioeina granulata granulata*  
*Osangularia cordieriana*

As for MPA53119

**2.11 MPA53121 PMH3809 ST 99647 44815**

*Stensioeina granulata granulata*  
*Osangularia cordieriana*

As for MPA53119

**2.12 MPA53122 PMH3810 ST 99726 44839**

*Stensioeina granulata granulata*  
*Osangularia cordieriana*

As for MPA53119

**2.13 MPA53128 PMH3816 ST 99195 47302**

*Stensioeina granulata granulata*  
*Osangularia cordieriana*  
*Marginotruncana sinuosa*

As for MPA53119. *Marginotruncana sinuosa* is confined to BGS14 in England (according to Hart et al, 1989) but has a longer range on the continent.



**2.14 MPA53133      PMH3821      SU00134 47226**

*Stensioeina granulata granulata*  
*Stensioeina exsculpta exsculpta*  
*Stensioeina polonica*

The presence of *S. polonica* indicates foraminiferal zone BGS17. The subzone can not be ascertained as key species such as *Gavelinella stelligera*, *Reussella szajnochae praecursor*, *Cibicides beaumontianus* and *Lingulogavelinella arnagerensis* were not found. BGS 17 is confined to the succession between Chartham Flint and immediately below Peake's Sponge Bed; upper, but not uppermost, Seaford Chalk Formation.

**2.15 MPA53135      PMH3823      SU 01091 45196**

*Lingulogavelinella arnagerensis*  
*Stensioeina polonica*  
 ?*Praebulimina carseyae*

The concurrent range of the first two listed indicates foraminiferal subzone BGS 17i (within the *coranguinum* Zone) which is situated between the Chartham Flint and immediately above Whitaker's 3" Flint (upper not uppermost Seaford Chalk Formation). However ?*Praebulimina carseyae*, if correctly identified, indicates a position above Whitaker's 3" Flint, placing the fauna in the very basal part of BGS17ii (but other indicators of 17ii, such as *Cibicides beaumontianus*, were not present).

**2.16 MPA53143      PMH3831      SU 12868 50181**

*Verneuilina muensteri*  
*Gavelinella pertusa*  
*Globotruncana bulloides*  
*Osangularia cordieriana*

The first three listed species indicate an age no older than the upper part of foraminiferal zone BGS13. *Osangularia cordieriana* first appears at the top of the zone, at the East Cliff Marls (and lateral equivalents). Species of *Stensioeina granulata* and *S. exsculpta* were not present suggesting that the assemblage is not of BGS14 or BGS15 zonal age. Elsewhere in southern England, this fauna is confined to the uppermost Lewes Nodular Chalk Formation.

*Inoceramus* prisms were common especially in the 125 $\mu$  sieve fraction sieve and rare ?radiolaria were also observed.

**2.17 MPA53146      PMH3834      SU 13332 45457**

*Gavelinella cristata*  
*Stensioeina granulata perfecta*

The presence of the two species listed and the absence of *Bolivinooides* spp suggests a position within foraminiferal zone BGS18ii (middle part of the *socialis* macrofaunal subzone). This correlates with the succession between Peake's Sponge Bed and Barrois Sponge Bed (and lateral equivalents) in the basal Newhaven Chalk Formation, elsewhere in southern England.

**2.18 MPA53150      PMH3838      SU 13133 48641**

*Stensioeina exsculpta exsculpta*

*Stensioeina granulata granulata*

The appearance of *S. exsculpta exsculpta* marks the base of foraminiferal zone BGS15. The marker for BGS16, *Loxostomum eleyi*, was not found in the sample. BGS15 equates with the lower (not lowest) part of the *coranguinum* zone in the lower (but not basal) Seaford Chalk and below the Hope Point Marl (and lateral equivalents).

**2.19 MPA53153      PMH3841      SU 15037 45763***Stensioeina polonica**Lingulogavelinella arnagerensis*

The concurrent range of these two species defines foraminiferal subzone BGS17i (= upper middle *coranguinum* macrofaunal zone). Lithostratigraphically, this fauna is confined to the succession between the Chartham Flint and just above Whitaker's 3" Flint (& lateral equivalents) in the "middle" Seaford Chalk Formation.

## References

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