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Stratigraphical interpretation of Chalk Group macrofossils from the Aylesbury district (Sheet 238): Spring/Autumn 2012 fieldwork

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Open Report OR/12/067

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GEOLOGY & LANDSCAPE ENGLAND PROGRAMME

INTERNAL REPORT OR/12/067

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Map

Sheet 238, 1:50 000 scale,
Aylesbury

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Foreword

This report details the stratigraphical interpretation of geological details and Chalk Group macrofossils for 53 localities in the Aylesbury district (Sheet 238). Material was collected by MAW, A R Farrant and P M Hopson during fieldwork in the Spring and Autumn of 2012. This work is in connection with revision of the digital mapping and lithostratigraphical classification of the Chalk Group on Sheet 238.

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FIGURES

Figure 1. Map showing distribution of sites discussed in this report.

Figure 2. The stratigraphy of the Chalk Group referred to in this report

Figure 3. The chalk succession seen at [SP 90164 11342] ((12) of report). (a), (c), (d): contact of Plenus Marls and Melbourn Rock members of the Holywell Nodular Chalk Formation (arrowed). Note high angle fault lined with flint in (d) showing small offset of Plenus Marls/Melbourn Rock. Red note book is 0.19 m high. (b): view of the complete section (about 5m high).

Figure 4. The chalk succession at [SP 84678 05598] ((26) of report)

Figure 5. The chalk succession at [SP 90939 03524] ((30) of report)

Summary

Geological details and macrofossil collections from 53 localities within the Chalk Group of the Aylesbury district are described and stratigraphically interpreted. These data are used to support new digital mapping and lithostratigraphical subdivision of the Chalk Group on Sheet 238.

1 Introduction

New collections of macrofossils and geological details of 53 localities in the Chalk Group of the Aylesbury district (Sheet 238) are described below. Many of the localities are old, largely degraded chalk pits or cuttings, with relatively poor exposure of bedrock. Nevertheless, these localities provide valuable insights into lithological variation within the Chalk Group of the district. Combining these lithological observations with biostratigraphical dating of the macrofaunas, permits correlation with the standard lithostratigraphical framework established for the Chalk Group of southern England (e.g. Mortimore et al., 2001). These interpretations are used to support new digital field mapping and lithostratigraphical classification of the Chalk Group of the Aylesbury district, following the field methodology described by Aldiss et al. (2012).

The distribution of the localities described in this report is summarised on Figure 1, and Figure 2 shows the stratigraphy referred to in this report. Author citations for fossil species are given in Appendix 1.

2 Stratigraphy

The 53 localities in the Chalk Group of the Aylesbury district that form the basis of this work are described sequentially below.

- (1) Exposure on east side of bridleway adjacent to Grove Wood, c. 350 m NNW of Hastoe House, Hastoe, Hertfordshire.

1:10 000 SP90NW NGR: SP 91606 09755

Specimen nos: WMD 16035 – 16045

The specimens were collected from poorly fossiliferous, grainy-textured chalk; mostly rather soft but with more indurated patches. The sparse fossil material comprises fragmentary remains of the inoceramid bivalve *Cremnoceramus*, including *C. crassus*?, and a cidarid echinoid fragment.

Interpretation: *Cremnoceramus crassus* suggests assignment to the *M. cortestudinarium* Zone, in which *Cremnoceramus* is characteristic. In conjunction with the lithology, assignment to the higher part of the Lewes Nodular Chalk might be inferred.

Conclusion: White Chalk Subgroup, upper Lewes Nodular Chalk Formation; Coniacian, *M. cortestudinarium* Zone.

- (2) Exposure on West side of bridleway. c. 420 m NNW of Hastoe House, Hertfordshire.

1:10 000 SP90NW NGR: SP 91600 09801

Specimen nos: WMD 16046 – 16048

The specimens were collected from a similar Chalk to that seen at (1) (above), although somewhat more indurated in character. The fauna includes the inoceramid bivalve *Cremnoceramus*, including *C. denselamellatus*.

Interpretation: *Cremnoceramus denselamellatus* suggests assignment to the *M. cortestudinarium* Zone, in which *Cremnoceramus* is characteristic. In conjunction with the lithology, assignment to the higher part of the Lewes Nodular Chalk might be inferred.

Conclusion: White Chalk Subgroup, upper Lewes Nodular Chalk Formation; Coniacian, *M. cortestudinarium* Zone.

(3) Exposure on west side of bridleway, 380 m SSE of West Leith Farm, Tring, Hertfordshire.

1:10 000 SP90NW NGR: SP 91643 09967

Specimen nos: WMD 16049 – 16055; 16056 – 16057

This locality exposes the Chalk Rock, at the base of the Lewes Nodular Chalk Formation. There is a rapid downward transition, within 1 m, from the intensely hard chalk of the Chalk Rock, into firm, smooth-textured chalk resembling New Pit Chalk. This relationship is somewhat unexpected, as previous studies (Bromley & Gale, 1982) suggest that an interval of nodular chalk containing the Fognam Marl is likely to occur below the Chalk Rock.

Material collected from the top of the New Pit Chalk includes the bivalve *Inoceramus cuvieri*, and the bivalve *Martesia? rotunda* was collected from the Chalk Rock.

Interpretation: *Inoceramus cuvieri* is characteristic of the upper New Pit Chalk, but also ranges into the lower part of the Lewes Nodular Chalk. *Martesia? rotunda* is one of the characteristic molluscs of the Chalk Rock described by Woods (1897). The whole interval is inferred to equate with a level near the top of the *T. lata* Zone.

A nearby locality (7) (below) suggests that there may be bands of harder, grainy-textured chalk alternating with smoother-textured chalk below the Chalk Rock. On this basis, the soft, smooth-textured chalk immediately below the Chalk Rock at this locality is provisionally assigned to the basal Lewes Nodular Chalk.

Conclusion: White Chalk Subgroup, basal Lewes Nodular Chalk Formation (including Chalk Rock); Turonian, upper *T. lata* Zone.

(4) Exposure on west side of bridleway, 360 m SSE of West Leith Farm, Tring, Hertfordshire.

1:10 000 SP90NW NGR: SP 91647 09983

Specimen nos: WMD 16058 – 16062

The specimens were collected from firm to soft, smooth-textured chalk, and mainly comprise remains of the inoceramid bivalve *Inoceramus cuvieri*.

Interpretation: *Inoceramus cuvieri* is most characteristic of the *T. lata* Zone, especially the higher part of this interval, and the lithological evidence favours assignment to the higher part of the New Pit Chalk Formation.

Conclusion: White Chalk Subgroup, upper New Pit Chalk Formation; Turonian, upper *T. lata* Zone.

(5) Exposure on east side of bridleway, c. 240 m SE of West leith Farm, Tring, Hertfordshire.

1:10 000 SP91SW NGR: SP 91708 10145

Specimen no.: WMD 16063

The specimen is the bivalve *Inoceramus cuvieri*, in firm, smooth-textured chalk.

Interpretation: *Inoceramus cuvieri* is most characteristic of the *T. lata* Zone, especially the higher part of this interval, and the lithological evidence favours assignment to the higher part of the New Pit Chalk Formation.

Conclusion: White Chalk Subgroup, upper New Pit Chalk Formation; Turonian, upper *T. lata* Zone.

- (6) Exposure on east bank of bridleway, c. 220 m SE of West Leith Farm, Tring, Hertfordshire.

1:10 000 SP91SW NGR: SP 91683 10166

Specimen nos: WMD 16064 – 16066

The specimens include the bivalve *Inoceramus cuvieri*, in firm, smooth-textured chalk.

Interpretation: *Inoceramus cuvieri* is most characteristic of the *T. lata* Zone, especially the higher part of this interval, and the lithological evidence favours assignment to the higher part of the New Pit Chalk Formation.

Conclusion: White Chalk Subgroup, upper New Pit Chalk Formation; Turonian, upper *T. lata* Zone.

- (7) Exposure on south side of track, c. 410 m NW of Hastoe House, Hertfordshire.

1:10 000 SP90NW NGR: SP 91451 09711

Specimen nos: WMD 16067 – 16071

The specimens were collected from patchily hard, grainy-textured chalk, beneath an interval of softer chalk, which in turn is overlain by intensely hard chalk forming part of the Chalk Rock. The fauna is as follows:

Bivalvia: *Inoceramus cuvieri*
Pycnodonte vesiculare

Ammonoidea: *Lewesiceras mantelli*

Echinoidea: test fragment

Interpretation: *Lewesiceras mantelli* indicates the *Subprionocyclus neptuni* ammonite Zone, corresponding with the uppermost *T. lata* and overlying *P. (S.) plana* zones of the traditional, non-ammonite biozonal classification (Gale, 1996). The lithology and field relations are consistent with assignment to the basal Lewes Nodular Chalk Formation.

Conclusion: White Chalk Subgroup, basal Lewes Nodular Chalk Formation; Turonian, upper *T. lata* Zone or *P. (S.) plana* Zone.

- (8) Exposure on west side of track, c. 400 m NW of Hastoe House, Hastoe, Hertfordshire.

1:10 000 SP90NW NGR: SP 91401 09644, SP 9141 0964

Specimen nos: WMD 16072 – 16073 [SP 91401 09644]

ARF 2547 – 2549; 2567 – 2571 [SP 9141 0964; the same or a nearby site to that from which WMD material collected]

The WMD and ARF material comprises specimens of the inoceramid bivalve *Inoceramus cuvieri* in soft, smooth-textured chalk.

Interpretation: Relatively common *Inoceramus cuvieri* suggests the upper *T. lata* Zone, and association with soft, smooth-textured chalk suggests assignment to the upper New Pit Chalk Formation. This locality is nearby and at similar topographic level to (7) (above), which is assigned to the basal Lewes Nodular Chalk. The boundary of the New Pit Chalk and Lewes

Nodular Chalk could therefore be situated between localities (7) and (8). Evidence locally (see (7) above) suggests that bands of soft, smooth-textured chalk alternate with harder chalk below the Chalk Rock, and this might explain why relatively soft-textured chalk continues to occur at higher elevations in the trackside further SW of (7); unequivocal basal Lewes Nodular Chalk (below the Chalk Rock) was seen at [SP 91397 09600] and [SP 91389 09589], based on the development of nodular chalk texture. Alternatively, this relationship might be explained if the strike of the New Pit / Lewes Chalk boundary swings round towards the NNE locally, approximately along the alignment of the track exposure. Bromley and Gale (1982) appear to record about 2 m of non-nodular chalk between the base of the Chalk Rock and the Fognam Marl near Great Missenden.

Conclusion: White Chalk Subgroup, ? upper New Pit Chalk Formation; Turonian, upper *T. lata* Zone.

- (9) Exposure just below old chalk pit, adjacent to track, c. 830 m NW of Park Farm, Wigginton, Hertfordshire.

1:10 000 SP91SW NGR: SP 93346 10921

Specimen nos: WMD 16074 – 16077

The specimens are of the inoceramid bivalve *Inoceramus cuvieri*, in soft, blocky-weathering, smooth-textured chalk.

Interpretation: The association of *I. cuvieri* with soft, blocky-weathering, smooth-textured chalk suggests assignment to the New Pit Chalk Formation. This is confirmed by material collected from (10) (below).

Conclusion: White Chalk Subgroup, New Pit Chalk Formation; Turonian, *T. lata* Zone.

- (10) Exposure near top of old chalk pit, c. 725 m NW of Park Farm, Wigginton, Hertfordshire.

1:10 000 SP91SW NGR: SP 93430 10875

Specimen nos: WMD 16078 – 16085

The specimens comprise the brachiopod *Terebratulina lata* and the inoceramid bivalve *Inoceramus cuvieri*? (several specimens), associated with soft, smooth-textured chalk. This extensive old chalk pit, with local areas of exposed material, shows no sign of hard, grainy-textured chalk.

Interpretation: The lithology and fauna indicate assignment to the *T. lata* Zone and the New Pit Chalk Formation. There is no evidence for the Lewes Nodular Chalk, the basal part of which (high *T. lata* Zone) can also be associated with the above fauna.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation; Turonian, *T. lata* Zone.

- (11) Brash from animal burrows just below old chalk pit, adjacent to track, c. 830 m NW of Park Farm, Wigginton, Hertfordshire.

1:10 000 SP91SW NGR: SP 93346 10921

Specimen nos: WMD 16086 – 16095

These specimens were collected from animal burrows associated with (9) above, and include the bivalve *Inoceramus cuvieri* as well as fragments of hard, iron-stained chalk.

Interpretation: The fragments of hard, iron-stained chalk are very like material from the Lewes Nodular Chalk, but this interpretation is precluded by material collected from (10) above, unless

there is a local structure affecting the succession. The hard chalk might represent a locally developed horizon of indurated chalk (e.g. sponge bed) within the New Pit Chalk Formation. *Inoceramus cuvieri* tends to suggest the *T. lata* Zone.

Conclusion: White Chalk Subgroup, ?New Pit Chalk Formation; Turonian, *T. lata* Zone.

- (12) Newly excavated/cleared section at entrance to house on Tring Hill (part of old chalk pit), c. 200 m NNE of Icknield House, near Bucklandwharf, Buckinghamshire.

1:10 000 SP91SW NGR: SP 90164 11342

Specimen nos: WMD 16096 – 16097

The section (Fig. 3) exposes part of the Plenus Marls Member, overlain by about 5 m of hard, nodular chalk with marl seams. The specimens, from the interval above the Plenus Marls, are the brachiopod *Orbiryhynchia cuvieri* and the bivalve *Mytiloides*? (shell fragment). Extensive excavation / detailed logging and sampling of the section were not possible because it forms the driveway entrance to a private house.

Interpretation: The Plenus Marls mark the base of the Holywell Nodular Chalk Formation, to which all of the overlying succession can be inferred to belong. *Orbiryhynchia cuvieri* and *Mytiloides* are characteristic of the *Mytiloides* spp. Zone.

Conclusion: White Chalk Subgroup, Holywell Nodular Chalk Formation (including Plenus Marls Member); Turonian, *Mytiloides* spp. Zone.

- (13) Exposure adjacent to track in Wendover Woods, c. 540 m NW of Triangulation Point on Aston Hill, Buckinghamshire.

1:10 000 SP81SE NGR: SP 88634 10326

Specimen nos: WMD 16098 – 16101

The specimens are of the inoceramid bivalve *Inoceramus cuvieri*, associated with soft, blocky-weathering chalk.

Interpretation: The lithology and fauna suggest assignment to the *T. lata* Zone and the New Pit Chalk Formation. This interpretation is supported by nearby sites that show the development of the Chalk Rock ((15) below) about 15 m higher in the succession.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation; Turonian, *T. lata* Zone.

- (14) Exposure of hard, nodular chalk bed, on N side of track in Wendover Woods, c. 300 m W of Triangulation Point on Aston Hill, Buckinghamshire.

1:10 000 SP81SE NGR: SP 88757 10008

Specimen nos: WMD 16102 – 16106

The fauna, in hard, nodular, gritty, bioclastic chalk, includes the following:

Brachiopoda: *Orbiryhynchia reedensis*

Bivalvia: *?Inoceramus cuvieri*

Echinoidea: *Micraster* sp. (showing sutured ambulacra)

Interpretation: The lithology and fauna indicates the *P. (S.) plana* Zone and the lower part of the Lewes Nodular Chalk Formation, possibly close to the top of the Chalk Rock.

Conclusion: White Chalk Subgroup, lower Lewes Nodular Chalk Formation; Turonian, *P. (S.) plana* Zone.

- (15) Exposure of Chalk Rock on N side of track in Wendover Woods, c. 350 m W of Triangulation Point on Aston Hill, Buckinghamshire.

1:10 000 SP81SE NGR: SP 88713 10016

Specimen nos: WMD 16107 – 16108

The specimens are lithological samples of intensely hard, iron-stained and glauconitised chalk.

Interpretation: The Chalk Rock exposed here forms a massive bed of crystalline chalk, with large glauconitised pebbles on its upper surface. Based on the section recorded by Bromley and Gale at Great Missenden, the local Chalk Rock in the Aylesbury district likely comprises three named hardgrounds (Fognam Farm, Blounts Farm, Hitchwood) corresponding to at least 5 beds of strongly indurated chalk, and six mineralised surfaces. It is not certain how the above bed correlates with the succession, but field relations suggest that is likely to be within the lower part of the succession.

Conclusion: White Chalk Subgroup, lower Lewes Nodular Chalk Formation (Chalk Rock Member); Turonian.

- (16) Exposure on E side of track in Wendover Woods, c. 500 m WNW of Triangulation Point on Aston Hill, Buckinghamshire.

1:10 000 SP81SE NGR: SP 88587 10137, SP 8856 1009

Specimen nos: WMD 16109 – 16114 [SP 88587 10137]

ARF 2572 – 2575 [SP 8856 1009; the same locality as the WMD material might be intended]

The specimens, in soft, smooth-textured, blocky-weathering chalk, exclusively comprise inoceramid bivalves, assigned with varying degrees of confidence to *Inoceramus cuvieri*.

Interpretation: The lithology and fauna suggest the *T. lata* Zone and the higher part of the New Pit Chalk Formation. This is supported by the nearby occurrence of basal Lewes Nodular Chalk (see (15) above).

Conclusion: White Chalk Subgroup, upper New Pit Chalk Formation; Turonian, *T. lata* Zone.

- (17) Exposure in low bank on S side of track up Gallows Hill, 540 m ENE of Triangulation Point on Beacon Hill, Ivinghoe Hills, Ivinghoe, Buckinghamshire.

1:10 000 SP91NE NGR: SP 96441 17131

Specimen nos: WMD 16115 – 16126

The specimens were collected from patchily hard, nodular chalk, and comprise:

Brachiopoda: terebratulid

Bivalvia: *Mytiloides* sp.

inoceramid shell fragments

Spondylus latus

Echinoidea: *Conulus subrotundus*

Interpretation: The record of nodular chalk and *Mytiloides* suggests the *Mytiloides* spp. Zone and the Holywell Nodular Chalk Formation. However, *Conulus subrotundus* and large terebratulid brachiopods are more characteristic of the *T. lata* Zone and the lower New Pit Chalk Formation. It is possible that this locality spans the boundary of the Holywell and New Pit Chalk formations, and that the lower part of the New Pit Chalk is somewhat condensed.

Conclusion: White Chalk Subgroup, ?boundary of Holywell Nodular Chalk and New Pit Chalk formations; Turonian, *T. lata* Zone.

(18) Exposure in low bank on S side of track up Gallows Hill, 690 m ENE of Triangulation Point on Beacon Hill, Ivinghoe Hills, Ivinghoe, Buckinghamshire.

1:10 000 SP91NE NGR: SP 96616 17107

Specimen nos: WMD 16127 – 16136

The specimens, from a slightly higher topographical level than (17) (above), include the inoceramid bivalve *Inoceramus cuvieri*. The lithology of the chalk appears patchily hard and nodular in places.

Interpretation: This locality is only about 170 m east of (17) (above), and at a slightly higher topographical level. The record of *Inoceramus cuvieri* suggests the *T. lata* Zone, and a level in the New Pit Chalk might be inferred from the interpreted presence of the Holywell / New Pit Chalk junction at (17). However, the patchily hard and nodular chalk is atypical of the New Pit Chalk. It is possible that the basal New Pit Chalk is here somewhat condensed, as suggested by the fauna from (17). In this context, the record of hard, nodular chalk at (11) could be evidence of more widespread condensed stratigraphy in the lower part of the New Pit Chalk.

Conclusion: White Chalk Subgroup, lower New Pit Chalk (?condensed); Turonian, *T. lata* Zone.

(19) Exposure in low bank on S side of track up Gallows Hill, 820 m ENE of Triangulation Point on Beacon Hill, Ivinghoe Hills, Ivinghoe, Buckinghamshire.

1:10 000 SP91NE NGR: SP 96751 17098

Specimen nos: WMD 16137 – 16140

The specimens, from c. 125 m east of (18), and at a higher topographical level, comprise fragments of the inoceramid bivalve *Inoceramus cuvieri* in soft, smooth-textured, blocky-weathering chalk.

Interpretation: The lithology and fauna are consistent with assignment to the *T. lata* Zone and the new Pit Chalk Formation. It is interesting to note that along the transect from localities (17) to (19), there was no evidence of *Mytiloides hercynicus* or *M. subhercynicus*, which typify the basal New Pit Chalk Formation. If the basal New Pit Chalk is locally condensed, the very thin-shelled *M. hercynicus* or *M. subhercynicus* might be too fragile to preserve.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation; Turonian, *T. lata* Zone.

(20) Overgrown chalk pit in wood, 330 m NE of Nut Hazel Cross Farm, near Hawridge, Buckinghamshire.

1:10 000 SP90NE NGR: SP 95883 05651

Specimen nos: WMD 16141 – 16143

ARF 2604 – 2608

The WMD specimens comprise remains of the inoceramid bivalve *Inoceramus cuvieri*, collected from a small exposure of soft, smooth-textured chalk containing a nodular flint. The ARF specimens include the bivalves *Spondylus latus* (in gritty chalk), *Inoceramus* ex gr. *lamarcki*? and *Inoceramus cuvieri*.

Interpretation: Overall, the fauna suggests assignment to the *T. lata* Zone, and the lithological data associated with the WMD material is consistent with assignment to the New Pit Chalk Formation. The ARF material appears to be associated with somewhat more gritty-textured, patchily hard chalk; it is presumed that this represents a local facies horizon rather than being indicative of a different stratigraphical level.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation; Turonian, *T. lata* Zone.

(21) Overgrown chalk pit in wood, 240 m NE of Nut Hazel Cross Farm, near Hawridge, Buckinghamshire.

1:10 000 SP90NE NGR: SP 95907 05562

Specimen nos: WMD 16144 – 16145

The specimens were collected from a very poor exposure of soft, smooth-textured, sparsely shelly chalk, just a short distance south-east of (20) (above), and comprise the inoceramid bivalve *Inoceramus cuvieri*.

Interpretation: Presumed *T. lata* Zone and New Pit Chalk Formation, based on lithology, fauna and proximity to (20) (above).

Conclusion: White Chalk Subgroup, New Pit Chalk Formation; Turonian, *T. lata* Zone.

(22) Excavated exposure of Chalk on mountain bike track in Wendover Woods at Daniel's Hole, c. 625 m NW of Aston Hill Farm, near Aston Clinton, Buckinghamshire.

1:10 000 SP81SE NGR: SP 89174 10436

Specimen nos: WMD 16146 – 16153

The specimens comprise the inoceramid bivalve *Mytiloides mytiloides*, in shell-rich, patchily hard, nodular chalk.

Interpretation: Abundant *Mytiloides mytiloides* is indicative of the higher part of the *Mytiloides* spp. Zone, and the lithological data confirms assignment to the Holywell Nodular Chalk.

Conclusion: White Chalk Subgroup, upper Holywell Nodular Chalk Formation; Turonian, *Mytiloides* spp. Zone.

(23) Excavated exposure of Chalk on mountain bike track in Wendover Woods at Daniel's Hole, c. 605 m NW of Aston Hill Farm, near Aston Clinton, Buckinghamshire.

1:10 000 SP81SE NGR: SP 89228 10427

Specimen nos: WMD 16154 – 16155

The specimens, from an exposure near (22) (above), and about 8 m higher topographically, are fragments of an inoceramid bivalve, tentatively identified as *Inoceramus* aff. *cuvieri*. The chalk is sparsely fossiliferous, with very little shell material, in contrast to that seen at (22).

Interpretation: The fauna suggests tentative assignment to the *T. lata* Zone. Assignment to the New Pit Chalk is consistent with the lack of shell compared to the unequivocal Holywell Nodular Chalk seen at (22). However, some aspects of the lithology are unusual, particularly the

relative hardness of the chalk. There is no evidence of the thin-shelled *Mytiloides hercynicus* or *M. subhercynicus* that typically occur a short distance above the junction with the Holywell Nodular Chalk.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation; Turonian, *T. lata* Zone.

- (24) Excavated exposure of Chalk on mountain bike track in Wendover Woods at Daniel's Hole, c. 600 m NW of Aston Hill Farm, near Aston Clinton, Buckinghamshire.

1:10 000 SP81SE NGR: SP 89222 10408

Specimen nos: WMD 16156 – 16164

The specimens comprise the brachiopod *Orbirhynchia herberti* and the inoceramid bivalve *Inoceramus cuvieri*, in soft, smooth-textured chalk. This locality is near (23) (above), and about 5 m higher topographically.

Interpretation: The lithology and fauna are consistent with assignment to the *T. lata* Zone and the New Pit Chalk Formation.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation; Turonian, *T. lata* Zone.

- (25) Graded pit forming part of Nature Reserve, at start of footpath up Bacombe Hill, c. 470 m SW of railway station at Wendover, Buckinghamshire.

1:10 000 SP80NE NGR: SP 86239 07371

Specimen nos: WMD 16165 – 16174

PMH 5517 – 5519

The above locality exposes shell-rich, nodular chalk with abundant *Mytiloides*, represented in the collected specimens.

Interpretation: The lithology and fauna indicate the *Mytiloides* spp. Zone and the Holywell Nodular Chalk Formation. The highest chalk exposed in the pit is much less nodular, but contains pink-shelled *Mytiloides*.

Conclusion: White Chalk Subgroup, Holywell Nodular Chalk Formation; Turonian, *T. lata* Zone.

- (26) Old chalk pit adjacent to footpath, c. 500 m ESE of Chequers, near Wendover, Buckinghamshire.

1:10 000 SP80NW NGR: SP 84678 05598

Specimen nos: WMD 16175 – 16192

PMH 5511 – 5516

The pit exposes about 2.5 m of smooth-textured, blocky-weathering chalk, with two marls seams in the upper part of the section (Fig. 4). The fauna is as follows:

Bivalvia: *Inoceramus* ex gr. *lamarcki*

I. lamarcki stuemckeii

Inoceramus cuvieri (several)

Inoceramus sp.

Pycnodonte vesiculare

Interpretation: The lithology and fauna indicate assignment to the *T. lata* Zone and the New Pit Chalk Formation. *Inoceramus lamarcki* tends to be more common in the lower and middle parts of the *T. lata* Zone, from which the lower to middle part of the New Pit Chalk might be inferred.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation (?lower to middle part); Turonian, *T. lata* Zone.

(27) Old chalk pit in Hampdenleaf Wood, c. 700 m NNE of Manor Farm, Little Hampden, Buckinghamshire.

1:10 000 SP80SE NGR: SP 86402 04327

Specimen nos: WMD 16193 – 16199

The specimens, from a c. 1 m exposure of fragmented, soft to firm chalk, are as follows:

Brachiopoda: *Terebratulina lata* (x2)

Bivalvia: *Inoceramus cuvieri*

Pycnodonte

oysters

Interpretation: The lithology and fauna suggest assignment to the *T. lata* Zone and the New Pit Chalk Formation. *Terebratulina lata* is generally more common in the upper part of its range, so the co-occurrence of this brachiopod with *Inoceramus cuvieri* might suggest the upper *T. lata* Zone and the higher part of the New Pit Chalk Formation.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation (?upper part); Turonian, *T. lata* Zone.

(28) Track in Cockshoots Wood with intermittent exposures of chalk along it, c. 600 m SW of Manor Farm, Wendover Dean, Buckinghamshire. Specimens collected 137 m SW from point where track enters Cockshoots Wood [at SP 87478 04003].

1:10 000 SP80SE NGR: SP 87414 03888, SP 87234 03661

Specimen nos: WMD 16200 – 16201 [SP 87414 03888]

PMH 5521 [SP 87234 03661]

The WMD specimens comprise the bivalve *Cremnoceramus?* (shell fragment) and the echinoid *Echinocorys* cf. *gravesi*. The PMH specimen is the bivalve *Mytiloides* aff. *incertus*. All the specimens are associated with very hard nodular chalk or intensely hard chalkstone.

Interpretation: This track section appears to show the transition from topmost New Pit Chalk Formation to Lewes Nodular Chalk Formation, continuing upwards through the Chalk Rock, and possibly to horizons of indurated chalk that broadly correspond with the Top Rock (Fig. 1). The WMD specimens were collected from very hard, nodular chalk, just below a chalkstone horizon which is immediately overlain by clay-with-flints, and suggest a level around the junction of the *P. (S.) plana* and *M. cortestudinarium* zones; the chalkstone may be the local equivalent of the Top Rock. The record of *Mytiloides* aff. *incertus* tends to suggest a slightly lower horizon within the *P. (S.) plana* Zone. The biozonal and lithological data indicate the lower to middle part of the Lewes Nodular Chalk Formation.

Conclusion: White Chalk Subgroup, lower to middle Lewes Nodular Chalk Formation; Turonian, *P. (S.) plana* Zone and ? basal *M. cortestudinarium* Zone.

(29) Old chalk pit in wood, c. 210 m SSW of Asheridge Farm, south of Cholesbury, Buckinghamshire

1:10 000 SP90NW

NGR: SP 92907 05127

Specimen nos: WMD 16202 – 16226

This very overgrown section exposes strongly nodular, marly chalk, overlain by a glauconitised hardground, capped by Clay-with-Flints. There are no flints in the exposed Chalk succession. The fauna is as follows:

Horizon: nodular chalk below hardground

Brachiopoda: terebratulid

Bivalvia: *Inoceramus cuvieri*

I. cuvieri?

Spondylus spinosus

S. spinosus?

Echinoidea: *Micraster?* (abraded internal mould in chalkstone)

Horizon: hardground

Brachiopoda: terebratulid

Bivalvia: *Inoceramus cuvieri*

Interpretation: The lithology and fauna strongly suggest a level in the highest *T. lata* Zone or basal *P. (S.) plana* Zone. The hardground almost certainly forms part of the Chalk Rock, and the lower part of the Lewes Nodular Chalk Formation can be inferred.

Conclusion: White Chalk Subgroup, lower Lewes Nodular Chalk Formation, Chalk Rock Member; Turonian, uppermost *T. lata* Zone or basal *P. (S.) plana* Zone.

(30) Old chalk pit in wood, 570 m NNE of Ballinger Farm, Ballinger Common, Buckinghamshire.

1:10 000 SP90SW

NGR: SP 90939 03524

Specimen nos: WMD 16227 – 16246

ARF 2598 – 2599

Chalk is intermittently exposed at this locality (Fig. 5). The lowest exposed part of the succession comprises soft, smooth-textured chalk, capped by a c. 5 cm marl seam. Above the marl is weakly nodular chalk. A few metres higher, animal brash from burrows comprises intensely hard, glauconitised chalk, probably representing a hardground.

The marl seam contains common specimens of the large agglutinating foraminifer *Labyrinthidoma*, with the bivalve *Inoceramus cuvieri* and brachiopod *Orbirhynchia* in the weakly nodular chalk above the marl. The fauna from the animal burrow brash includes the brachiopod *Orbirhynchia reedensis*.

The ARF material comprises specimens of the inoceramid bivalve *Inoceramus cuvieri*, from an unknown horizon within the chalk pit.

Interpretation: *Labyrinthidoma* is characteristically abundant in the Fognam Marl (= Southerham Marl 1 of Mortimore, 1986), in the upper *T. lata* Zone where *Inoceramus cuvieri* is also characteristic. *Orbirhynchia reedensis* tends to suggest a level in the lower *P. (S.) plana* Zone, and is typically associated with the Chalk Rock. The lithological and faunal data suggest

that the boundary between the New Pit Chalk and Lewes Nodular Chalk runs through the chalk pit, and is probably approximately coincident with the Fognam Marl.

Conclusion: White Chalk Subgroup, upper New Pit Chalk Formation & basal Lewes Nodular Chalk Formation (including Chalk Rock); Turonian, upper *T. lata* Zone and lower *P. (S.) plana* Zone.

(31) Old chalk pit in wood, 380 m NNW of Hill House, near Frith Hill, Great Missenden, Buckinghamshire

1:10 000 SP80SE

NGR: SP 89922 01886

Specimen nos: WMD 16247 – 16263

Chalk is very poorly exposed at this locality, and no indication of thickness between intermittently exposed horizons can be gained. The fauna is identified with respect to three levels, '1' being the lowest stratigraphically, and '3' the highest.

Horizon 1: material collected from animal burrow brash of intensely hard chalk

Bivalvia: *Inoceramus perplexus*

Echinoidea: *Micraster leskei* ? (large form)

Horizon 2: animal burrow brash just above Horizon 1, although original stratigraphical position somewhat uncertain

Bivalvia: *Mytiloides* aff. *stratoconcentricus*

Horizon 3: soft chalk from highest levels in chalk pit, seen in NE face

Bivalvia: ?*Inoceramus lusatie* (several fragments)

Echinoidea: *Sternotaxis* sp.

Ichnofossils: *Zoophycos* (in flint and marl preservation)

Interpretation: The fauna from horizons 1 and 2 is indicative of the lower *P. (S.) plana* Zone, and the lithology suggests the Chalk Rock Member in the lower part of the Lewes Nodular Chalk Formation.

The fauna of Horizon 3 suggests the higher part of the *P. (S.) plana* Zone, probably equivalent to the soft chalks that form the Cuilfail Zoophycos horizon in Sussex (Mortimore, 1986).

This locality was described by Bromley and Gale (1982, fig. 13) as one of their 'Great Missenden' localities, at which they excavated a section through the Chalk Rock, including the Fognam Marl, Fognam Farm Hardground, Blounts Farm Hardground and Hitchwood Hardground.

Conclusion: White Chalk Subgroup, lower to middle Lewes Nodular Chalk Formation (including Chalk Rock and Cuilfail Zoophycos); Turonian, *P. (S.) plana* Zone.

(32) Cutting adjacent to footpath, on N side of Hale Lane, c. 900 m E of church at Wendover, Buckinghamshire.

1:10 000 SP80NE

NGR: SP 88039 07419

Specimen nos: WMD 16264 – 16282

The fauna, in soft, smooth-textured chalk, is as follows:

Brachiopoda: terebratulid (small)

Bivalvia: *Inoceramus cuvieri*
I. cuvieri?
I. aff. cuvieri
I. sp.
Pycnodonte

Ammonoidea: *Collignoniceras?*

Interpretation: The fauna suggests assignment to the *T. lata* Zone, although some of the inoceramids are remarkably similar to Upper Cenomanian *Inoceramus pictus*. An image of one of these inoceramids has been sent to an external specialist for comment. Although some aspects of the inoceramid fauna are ambiguous, the ammonite fragment is unlike forms that are typically associated with the Upper Cenomanian.

In the context of a biostratigraphical assignment to the *T. lata* Zone, the lithological data suggests the presence of the New Pit Chalk Formation.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation; Turonian, *T. lata* Zone.

(33) Cutting adjacent to sunken track at The Hale, c. 2.1 km E of church at Wendover, Buckinghamshire.

1:10 000 SP80NE NGR: SP 89386 07448

Specimen nos: WMD 16283 – 16292

The fauna, in soft, smooth-textured, blocky-weathering chalk, comprises the inoceramid bivalve *Inoceramus cuvieri* (including questionably identified material).

Interpretation: The lithology and fauna suggest assignment to the *T. lata* Zone and the New Pit Chalk Formation.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation; Turonian, *T. lata* Zone.

(34) Rutted forestry track in Wendover Woods, c. 925 m due N of The Hale, east of Wendover, Buckinghamshire.

1:10 000 SP80NE NGR: SP 89247 08313, SP 8925 0830

Specimen nos: WMD 16293 – 16303 [SP 89247 08313]

ARF 2577 – 2583 [SP 89247 08313]

ARF 2584 – 2586 [SP 8925 0830; just below ARF 2577 – 2583]

The bulk of the above material comprises specimens of the inoceramid bivalve *Inoceramus cuvieri* (including questionably identified material). The WMD specimens occur in soft, smooth-textured chalk with nodular flints.

Interpretation: The lithological and faunal data suggests assignment to the upper *T. lata* Zone and the higher part of the New Pit Chalk Formation. The field assignment of the ARF material is basal Lewes Nodular Chalk, raising the possibility that the smooth-textured chalk seen at outcrop is part of a transitional succession at the boundary of the New Pit Chalk and Lewes Nodular Chalk formations.

Conclusion: White Chalk Subgroup, New Pit Chalk Formation (upper part) or basal Lewes Nodular Chalk Formation; Turonian, upper *T. lata* Zone.

(35) Banks of pond adjacent to Wendover church, Buckinghamshire.

1:10 000 SP80NE NGR: 87049 07372

Specimen nos: WMD 16304 – 16313

The fauna, in rather hard, locally porcellaneous and *Chondrites*-bioturbated, very poorly fossiliferous chalk, is as follows:

Bivalvia: *Amphidonte*

Inoceramus pictus? (fragments; several specimens)

Plicatula inflata

oyster

Interpretation: The co-occurrence of *Inoceramus pictus* and *Amphidonte* is tentative evidence for the Upper Cenomanian, *C. guerangeri* Zone. The lithology and fauna are consistent with assignment to the Zig Zag Chalk Formation.

Conclusion: Grey Chalk Subgroup, Zig Zag Chalk Formation; Upper Cenomanian, ?*C. guerangeri* Zone.

(36) Scrub Wood, 365 m SE of Cobnut Farm, Dunsmore, Buckinghamshire.

1:10 000 SP80SW NGR: SP 86221 04794

Specimen no.: PMH 5520

The specimen is an indeterminate inoceramid shell fragment.

Conclusion: None possible.

(37) Old pumping station on the Grand Union Canal, 200 NNW of Triangulation Point, 1.16km NE of Drayton Beauchamp church, Hertfordshire.

1:10 000 SP91SW NGR: SP 9101 1267

Specimen nos: ARF 2537 – 2541

The fauna, in grey, marly chalk, includes the inoceramid bivalve *Inoceramus* ex gr. *crippsi*, and several whorl fragments of the ammonite *Schloenbachia varians*.

Interpretation: The fauna is not biozonally diagnostic, but suggests a level within the Lower Cenomanian, perhaps most likely the *M. mantelli* Zone.

The lithology and fauna are consistent with assignment to the West Melbury Marly Chalk Formation.

Conclusion: Grey Chalk Subgroup, West Melbury Marly Chalk Formation; ?Lower Cenomanian, ?*M. mantelli* Zone.

(38) Brash in field, 485 m SW of Ashenridge Farm, 1.5 km NW of Chartridge Church, Buckinghamshire

1:10 000 SP90NW NGR: SP 9248 0511

Specimen nos: ARF 2542 – 2546

The specimens are inoceramid bivalves, including *Inoceramus cuvieri*?

Interpretation: *Inoceramus cuvieri* is most characteristic of the *T. lata* Zone. The brash is a short distance below the basal Lewes Nodular Chalk seen at (29) (above), and assignment to the upper New Pit Chalk Formation seems the most likely interpretation.

Conclusion: White Chalk Subgroup, ?upper New Pit Chalk Formation; Turonian, ? upper *T. lata* Zone.

(39) Track section at base of scarp, just up from junction, 980 m WNW of Hastoe Cross, 1.22km SSE of Drayton Manor, Hertfordshire.

1:10 000 SP90NW NGR: SP 9138 0959

Specimen nos: ARF 2550 – 2553; 2561 – 2562

The specimens are fragmentary inoceramid bivalves, assigned with varying degrees of confidence to *Inoceramus cuvieri*.

Interpretation: *Inoceramus cuvieri* is characteristic of the *T. lata* Zone, from which the New Pit Chalk or lower Lewes Nodular Chalk might be inferred. This locality is close to (8) (above), which has lithological evidence for the likely presence of the junction of the New Pit Chalk and Lewes Nodular Chalk formations.

Conclusion: White Chalk Subgroup, upper New Pit Chalk Formation or basal Lewes Nodular Chalk Formation; Turonian, upper *T. lata* Zone.

(40) Tree roots at base of scarp on path, 85 m south of A41, 1.03 km SW of Tring Church, Hertfordshire

1:10 000 SP91SW NGR: SP 9194 1058

Specimen nos: ARF 2554 – 2560

The specimens are inoceramid shell fragments, including *Inoceramus cuvieri*.

Interpretation: *Inoceramus cuvieri* is most characteristic of the *T. lata* Zone, occurring in the New Pit Chalk and basal part of the Lewes Nodular Chalk.

Conclusion: White Chalk Subgroup, New Pit Chalk or basal Lewes Nodular Chalk; Turonian, *T. lata* Zone.

(41) Chalk in bank on track junction, 450 m south of West Leith Farm, 930 m NW of Hastoe Cross, Hertfordshire.

1:10 000 SP90NW NGR: SP 9156 0985

Specimen nos: ARF 2563 – 2566

The specimens are inoceramid shell fragments, including *Inoceramus cuvieri*.

Interpretation: *Inoceramus cuvieri* is most characteristic of the *T. lata* Zone, occurring in the New Pit Chalk and basal part of the Lewes Nodular Chalk.

Conclusion: White Chalk Subgroup, New Pit Chalk or basal Lewes Nodular Chalk; Turonian, *T. lata* Zone.

(42) Old pit on E side of valley, Hawridge, 400 m NE of Hawridge Church, Buckinghamshire.

1:10 000 SP90NE NGR: SP 9525 0622

Specimen nos: ARF 2587 – 2588

The specimens are part and counter-part of the inoceramid bivalve *Inoceramus* ex gr. *lamarcki*?

Interpretation: *Inoceramus lamarcki* mainly characterises the *T. lata* Zone, particularly the lower and higher parts of that zone. This distribution favours assignment to the lower – middle New Pit Chalk Formation or basal Lewes Nodular Chalk Formation.

Conclusion: White Chalk Subgroup, ? lower – middle New Pit Chalk Formation or basal Lewes Nodular Chalk Formation; Turonian, *T. lata* Zone.

(43) Tree root brash, 325 m SE of West Leith Farm, 1.41 km SW of Tring Church, Hertfordshire.

1:10 000 SP91SW NGR: SP 9183 1021

Specimen nos: ARF 2589 – 2590

The specimens, in intensely hard chalk, comprise the echinoid *Echinocorys* and an indeterminate inoceramid bivalve.

Interpretation: The fauna is biozonally undiagnostic, but the association of *Echinocorys* with intensely hard chalk is compatible with assignment to the Lewes Nodular Chalk Formation.

Conclusion: White Chalk Subgroup, ? Lewes Nodular Chalk Formation.

(44) Old pit at base of Hale Wood, on path 290 m SSE of The Hale, 1.61 km west of Chapel at Chapel Farm, Buckinghamshire.

1:10 000 SP80NE NGR: SP 8939 0701

Specimen nos: ARF 2591 – 2593

The specimens are inoceramid shell fragments, including *Inoceramus cuvieri*?

Interpretation: *Inoceramus cuvieri* is most characteristic of the *T. lata* Zone, occurring in the New Pit Chalk and basal part of the Lewes Nodular Chalk.

Conclusion: White Chalk Subgroup, upper New Pit Chalk Formation or basal Lewes Nodular Chalk Formation; Turonian, *T. lata* Zone.

(45) Tree roots, 110 m east of Tring Obelisk, 275 m NW of Trig Pit, Wiggington, Hertfordshire.

1:10 000 SP91SW NGR: SP 9334 1068

Specimen nos: ARF 2594 – 2595

The specimens, in very hard, heavily iron-stained chalk, are internal moulds of the echinoids *Micraster* sp. (possibly *M. normanniae*?) and *Echinocorys* sp.

Interpretation: The fauna may represent a level within the *P. (S.) plana* Zone, but this is very speculative, and poor preservation means that strictly, it is not possible to biozonally interpret the macro-fossils. However, the association of *Micraster*, *Echinocorys* and hard, iron-stained chalk supports assignment to a level within the Lewes Nodular Chalk Formation.

Conclusion: White Chalk Subgroup, ? Lewes Nodular Chalk Formation.

(46) Old pit, Stonehill Wood, 1.34 km SW of Buckland Common Chapel, 1.57 km NE of Lee Gate Chapel, Buckinghamshire.

1:10 000 SP90NW NGR: SP 9098 0647

Specimen no.: ARF 9596

The specimen is an indeterminate inoceramid shell fragment in hard, nodular chalk.

Interpretation: The specimen is biozonally undiagnostic, although the lithology supports the field assignment to the Lewes Nodular Chalk Formation.

Conclusion: White Chalk Subgroup, ?Lewes Nodular Chalk Formation.

(47) Exposure on track, 1.48 km SE of Wendover Church, 1.14 km WNW of Trig point (232m), Buckinghamshire.

1:10 000 SP80NE NGR: SP 8823 0633

Specimen nos: ARF 9597

The specimen is the inoceramid bivalve *Inoceramus cuvieri*?

Interpretation: *Inoceramus cuvieri* is most characteristic of the *T. lata* Zone, occurring in the New Pit Chalk and basal part of the Lewes Nodular Chalk.

Conclusion: White Chalk Subgroup, New Pit Chalk or basal Lewes Nodular Chalk; Turonian, *T. lata* Zone.

(48) Tree roots at base of scarp on path, 1.03 km SW of Tring Church, 1.28 km west of Tring obelisk, Hertfordshire.

1:10 000 SP91SW NGR: SP 9198 1054

Specimen nos: ARF 2600 – 2603

The specimens comprise fragments of inoceramid bivalves, including *Inoceramus cuvieri*.

Interpretation: *Inoceramus cuvieri* is most characteristic of the *T. lata* Zone, occurring in the New Pit Chalk and basal part of the Lewes Nodular Chalk.

Conclusion: White Chalk Subgroup, New Pit Chalk or basal Lewes Nodular Chalk; Turonian, *T. lata* Zone.

(49) Section on west side of track, 480 m south of West Leith Farm, Tring, Hertfordshire.

1:10 000 SP90NW NGR: SP 91561 09842

This section exposes a level close to the junction of the New Pit Chalk and Lewes Nodular Chalk formations. It shows the base of the Chalk Rock Member about 1.5 m above the appearance of nodular chalk. However, evidence from a nearby locality ((7) above) suggests that there may be bands of alternating hard and soft, nodular and non-nodular chalk, below the Chalk Rock. There is no evidence of the Fognam Marl in the above section, which marks the local base of nodular chalk at (30) (above).

Conclusion: White Chalk Subgroup, ?upper New Pit Chalk Formation and basal Lewes Nodular Chalk Formation.

(50) Old chalk pits in garden of private house on Tring Hill, 600 m ENE of Lodge Farm, near Bucklandwharf, Buckinghamshire.

1:10 000 SP91SW NGR: SP 90114 11407

This old chalk pit shows degraded sections spanning the topmost Zig Zag Chalk and basal Holywell Nodular Chalk (including Plenus Marls and Melbourn Rock). The pit forms part of a private garden, preventing further detailed work on the section.

Conclusion: Topmost Grey Chalk Subgroup and basal White Chalk Subgroup, uppermost Zig Zag Chalk Formation and basal Holywell Nodular Chalk Formation (including Plenus Marls Member & Melbourn Rock).

(51) Old chalk pit in Stocking's Wood, 750 m NNE of Missenden Abbey, Great Missenden, Buckinghamshire.

1:10 000 SP80SW

NGR: SP 89920 01769

Brash from animal burrows and tree roots in this largely overgrown chalk pit consists of hard chalkstone, including glauconitised pebbles. Given the nearby record of the hardgrounds in the Lewes Nodular Chalk at **(28)** (above), a level within the lower part of the Lewes Nodular Chalk might be inferred.

Conclusion: White Chalk Subgroup, lower Lewes Nodular Chalk Formation.

(52) Roadside bank near West Leith Farm, 270 m N of West Leith Farm, Hertfordshire.

1:10 000 SP91SW

NGR: SP 91489 10516

This roadside locality was visited to determine the possible presence of Holywell Nodular Chalk. The section contains very sparse shell material, but is patchily hard. This rather ambiguous combination of lithological features, compatible with aspects of both the Holywell and New Pit Chalk formations, might be analogous to the situation at **(17)** and **(18)** above, where the basal New Pit Chalk might exhibit condensed stratigraphy. A micro-fossil sample was taken from this locality for further investigation.

(53) 500 m ENE of Chalkshire Farm, Ellesborough, Buckinghamshire.

1:10 000 SP80NW

Specimen nos: PMH 5538 [NGR: SP 84550 07720]

PMH 5539 [NGR: SP 84500 07810]

PMH 5538 is from a slightly lower stratigraphical horizon than PMH 5539.

The specimens both appear to be *Inoceramus* ex gr. *crippsi*, PMH 5538 possibly representing the subspecies *reachensis*. The material occurs in a dense, somewhat micaceous and finely glauconitic chalk. PMH 5539 occurs in distinctly silty chalk.

Interpretation: *Inoceramus crrippsi* is most common in the Lower Cenomanian, but also ranges into the Middle Cenomanian.

Conclusion: Grey Chalk Subgroup.

3 Discussion

There is evidence from some of the above localities to suggest that the base of the New Pit Chalk might be developed in a condensed, more indurated, nodular chalk facies. This could account for the apparent absence of thin-shelled *Mytiloides hercynicus* or *M. subhercynicus* in the basal New Pit Chalk (= basal *T. lata* Zone).

The junction of the New Pit Chalk and Lewes Nodular Chalk appears to be less sharply defined within the district. There appears to be quite a substantial transitional interval, several metres thick, of weakly developed nodular chalk alternating with bands of relatively soft, smooth-textured chalk. There is the suggestion at one of the localities (30) (above) that the Fognam Marl (= Southerham Marl 1 of Mortimore, 1986) might be the most useful boundary marker-bed in exposed successions.

Appendix 1 – author citations for fossil species

Conulus subrotundus (Mantell, 1822)
Cremonoceras crassus (Petrascheck, 1903)
Cremonoceras denselamellatus (Kotsyubinsky, 1965)
Echinocorys gravesi (Desor, 1847)
Inoceramus crippsi Mantell, 1822
Inoceramus cuvieri J Sowerby, 1814
Inoceramus lamarcki Parkinson, 1819
Inoceramus lamarcki stuemckeii Heinz, 1928
Inoceramus lusatie Andert, 1911
Inoceramus perplexus Whitfield, 1877
Inoceramus pictus J de C Sowerby, 1829
Lewesiceras mantelli Wright & Wright, 1951
Martesia? rotunda (J de C Sowerby, 1850)
Micraster leskei (Desmoulins, 1837)
Micraster normanniae Bucaille, 1883
Mytiloides stratoconcentricus (Gümbel, 1868)
Mytiloides hercynicus (Petrascheck, 1903)
Mytiloides incertus (Jimbo, 1894)
Mytiloides mytiloides (Mantell, 1822)
Mytiloides subhercynicus (Seitz, 1934)
Orbirhynchia cuvieri (d'Orbigny, 1847)
Orbirhynchia herberti Pettitt, 1954
Orbirhynchia reedensis (Etheridge, 1881)
Plicatula inflata J de C Sowerby, 1823
Pycnodonte vesiculare (Lamarck, 1806)
Schloenbachia varians (J Sowerby, 1817)
Spondylus latus (J Sowerby, 1815)
Spondylus spinosus (J Sowerby, 1814)
Terebratulina lata Etheridge, 1881

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British Geological Survey holds most of the references listed below, and copies may be obtained via the library service subject to copyright legislation (contact libuser@bgs.ac.uk for details). The library catalogue is available at: <http://geolib.bgs.ac.uk>.

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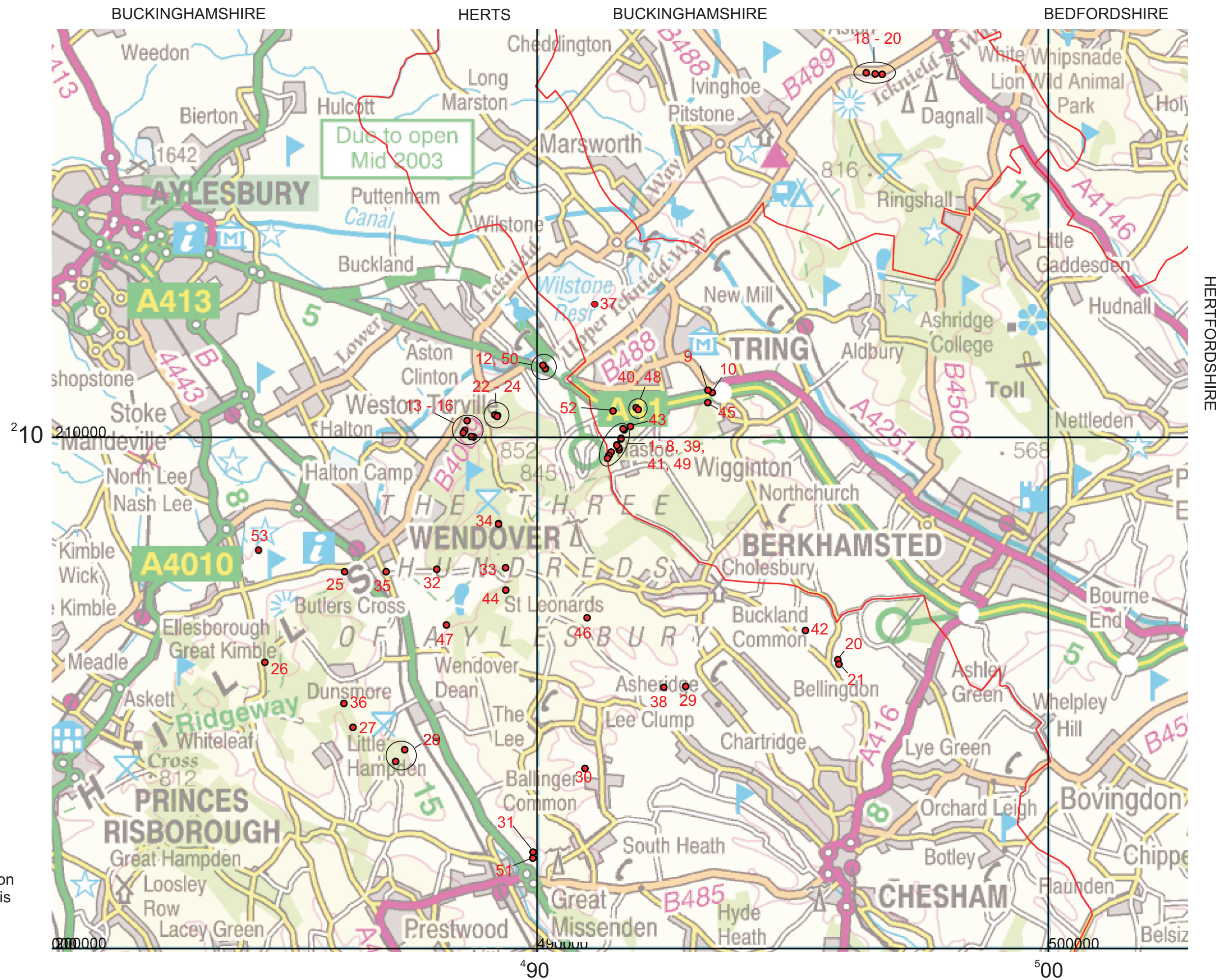


Figure 1. Map showing distribution of sites discussed in this report.

STAGE	BIOZONATION				Traditional Subdivisions	Subgroup	Formations/ Members		
CONIA-CIAN	<i>M. cortestudinarium</i>				Upper Chalk	W h i t e C h a l k	Lewes Nodular Chalk		(hardgrounds equivalent to Top Rock)
	<i>P. (S.) plana</i>						(Chalk Rock)		
TURONIAN	<i>T. lata</i>				Middle Chalk		New Pit Chalk		(possible condensed stratigraphy locally in Aylesbury district)
	<i>Mytiloides</i> spp.						Holywell Nodular Chalk		
CENOMANIAN	<i>N. juddii</i>				Lower Chalk	Grey Chalk	(Plenus Marls)		
	<i>M. geslinianum</i>						Zig Zag Chalk		
	<i>C. guerangeri</i>				West Melbury Marly Chalk				
	<i>A. jukesbrownei</i>								
	<i>A. rhotomagense</i>	<i>T. acutus</i>							
		<i>T. costatus</i>							
	<i>C. inerme</i>				(Glaucinitic Marl)				
	<i>M. dixonii</i>								
	<i>M. mantelli</i>	<i>M. saxbii</i>							
		<i>S. schluteri</i>							
<i>N. carcitense</i>									

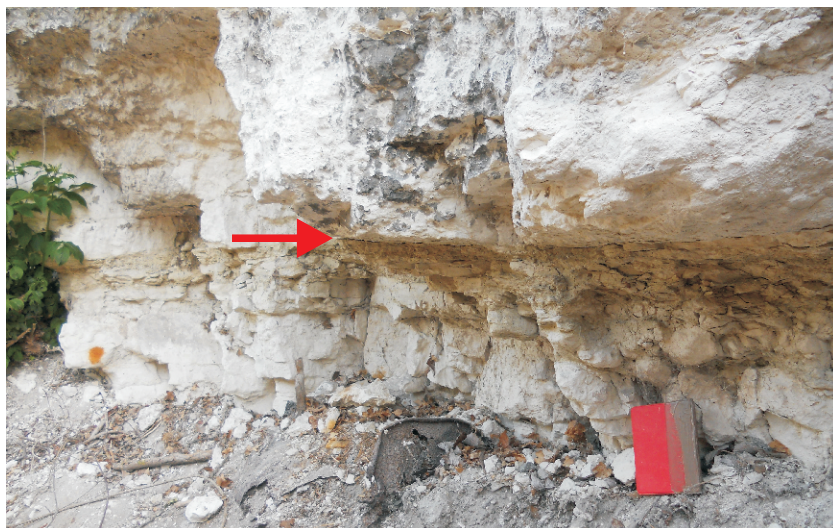
Figure 2. The stratigraphy of the Chalk Group referred to in this report



(a)



(b)



(c)



(d)

Figure 3. The chalk succession seen at [SP 90164 11342] ((12) of report). (a), (c), (d): contact of Plenus Marls and Melbourn Rock members of the Holywell Nodular Chalk Formation (arrowed). Note high angle fault lined with flint in (d) showing small offset of Plenus Marls/Melbourn Rock. Red note book is 0.19 m high. (b): view of the complete section (about 5 m high).

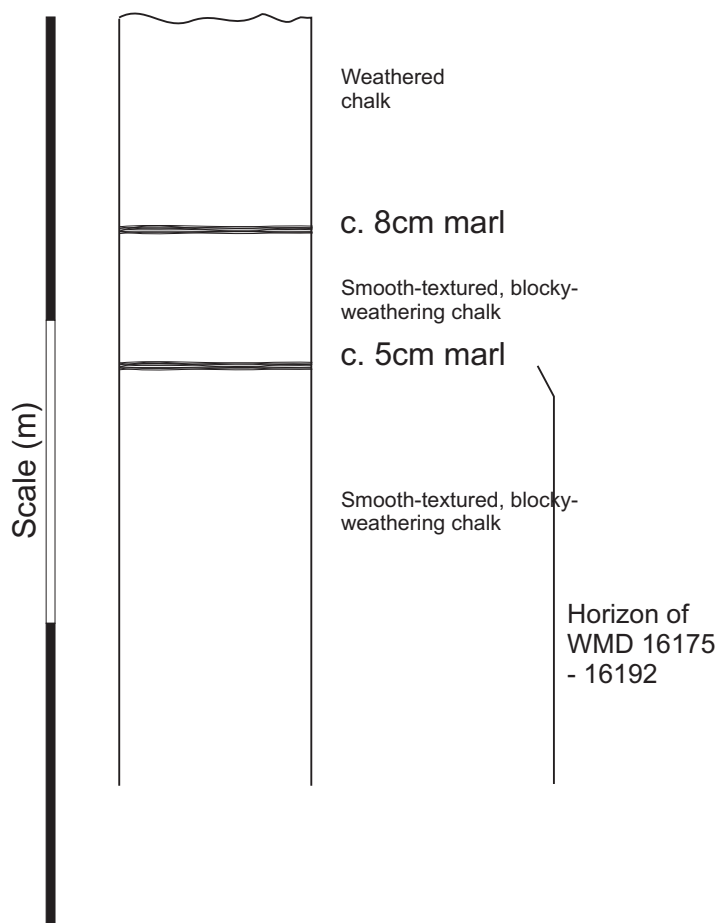


Figure 4. The chalk succession at [SP 84678 05598] ((26) of report)

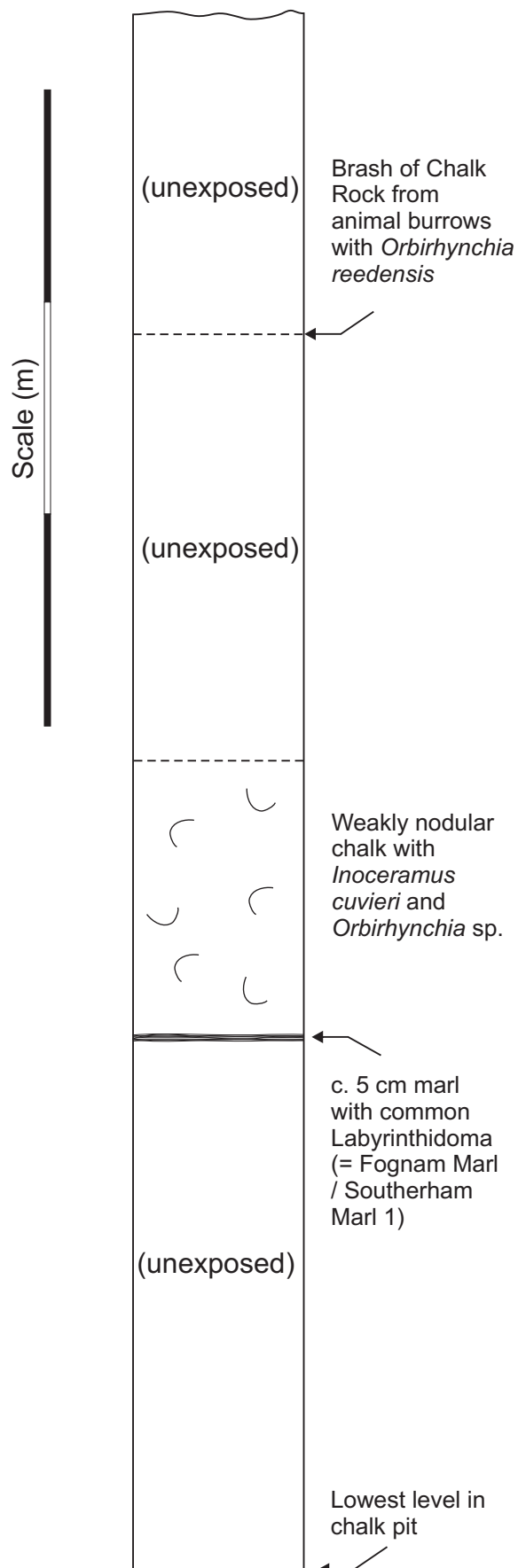


Figure 5. The chalk succession at [SP 90939 03524] ((30) of report)