St Helens, Hampshire

[SZ 638 899]

Introduction

This site includes a relatively recently discovered (1978) outcrop of the fossiliferous 'Insect Limestone' within the Bembridge Marls (see GCR site report for Gurnard for a full account of the strata and sedimentology). The insect-bearing limestone is exposed in the lower part of the cliff around Node's Point, north-east of St Helens and loose blocks may also be found on the foreshore below.

St Helens is one of a network of GCR sites (see also GCR site reports for Gurnard and Bouldner) of latest Eocene or earliest Oligocene age in the Hampshire Basin from which a diversity of more than 250 fossil insects has been found within the Bembridge Marls. It is also the most distant insect-rich site from the classical exposure of the Bembridge Marls in Thorness Bay, lying 18 km to the ESE.

Description

The low, slipped cliff between St Helens and Node's Point provides a 250 m exposure of the uppermost Bembridge Limestone and lower Bembridge Marls. The succession is condensed compared to that seen in the nearby fine section of the Bembridge Beds in Whitecliff Bay. A single 0.1 m-thick micrite in the Insect Bed has yielded insect remains (Figure 5.27) and dips gently southwards (from *c.* 8–0.5 m above cliff base) towards the axis of the Bembridge Syncline.

The insects have not been studied in detail, but at least five orders are represented, and should provide valuable information on palaeoecological diversity in and surrounding the ancient water body in which the 'Insect Limestone' was deposited. The 'Insect Limestone' forms the most productive insect-bearing horizon in the British Tertiary deposits.

The entomofauna here includes beetles (Coleoptera); true flies (Diptera) for example crane-flies (Tipulidae), fungus gnats (Sciaridae), 'dance'-flies (Empididae); Hymenoptera including weaver ants (Formicidae: *Oecopbylla* sp.), bugs (Hemiptera) such as jumping plant lice (Psylloldea); and *Mastotermes anglicus,* a termite (Isoptera) belonging to a now relict tropical genus found in north Australia and New Guinea.

The insects are accompanied by plant remains, ostracods, the gastropod *Galba* and more significantly, the only Tertiary conchostracan (clam shrimp) known from Europe (Figure 5.28). The latter is rare (being known only from less than six specimens). These non-marine crustaceans have a bivalved carapace remarkably convergent with that of lamelli-branch molluscs although made of chitin. As a result of this organic proteinaceous composition, conchostracans often occur with insects in the fossil record although they are now extinct in Britain.

Interpretation

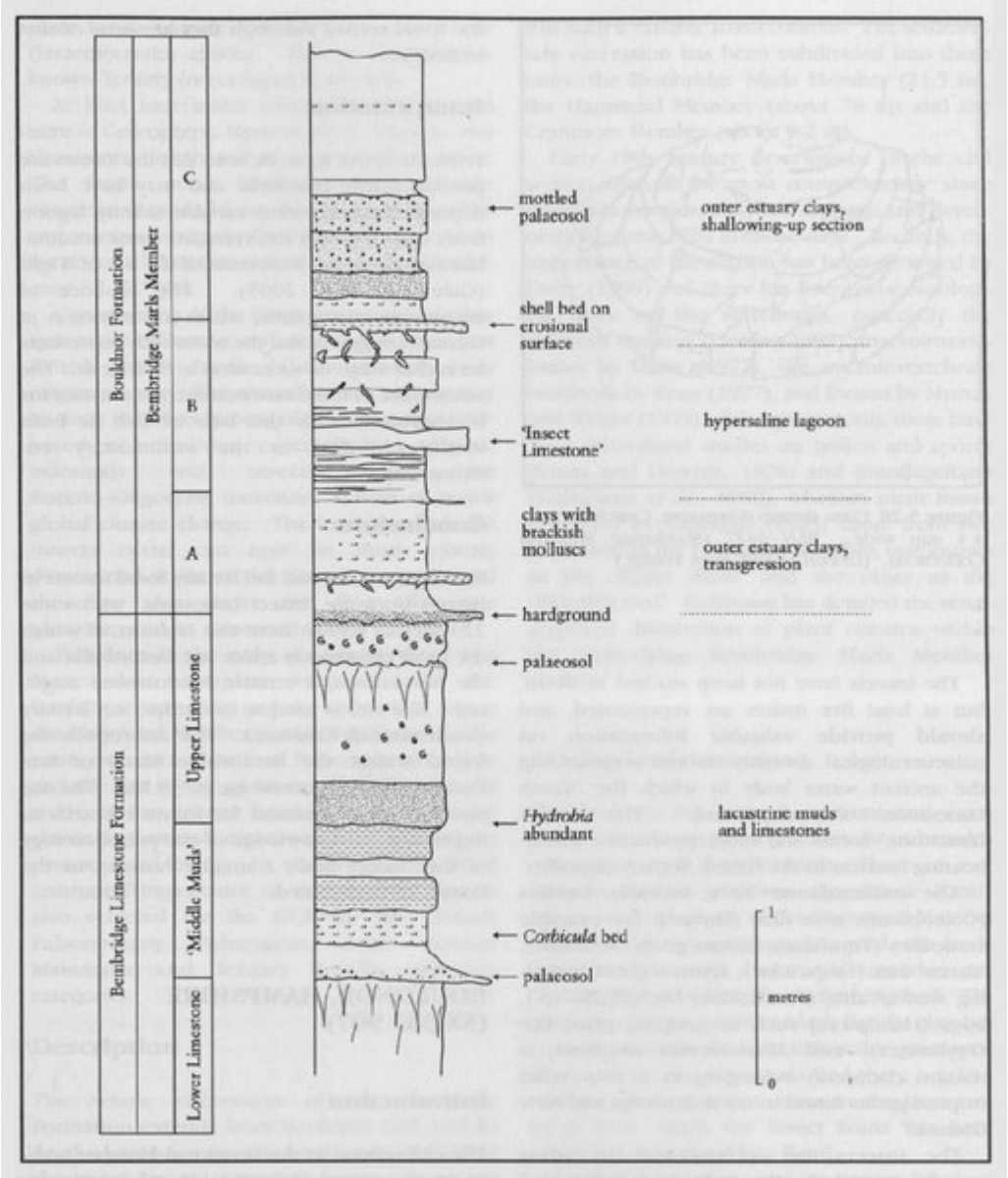
From the above it can be seen that the insects are predominantly terrestrial and may have been deposited in a separate, variable salinity, lagoon from that in which the Gurnard strata accumulated on the north-west coast of the Isle of Wight (Gale and Self, 2005). The absence of anostracan crustaceans, which are common at Gurnard, suggests that the waterbody represents an earlier stage of succession at St Helens. The occurrence of these rare non-marine crustaceans is consistent with the lack of fish at both localities linked to the sedimentary environment.

Conclusions

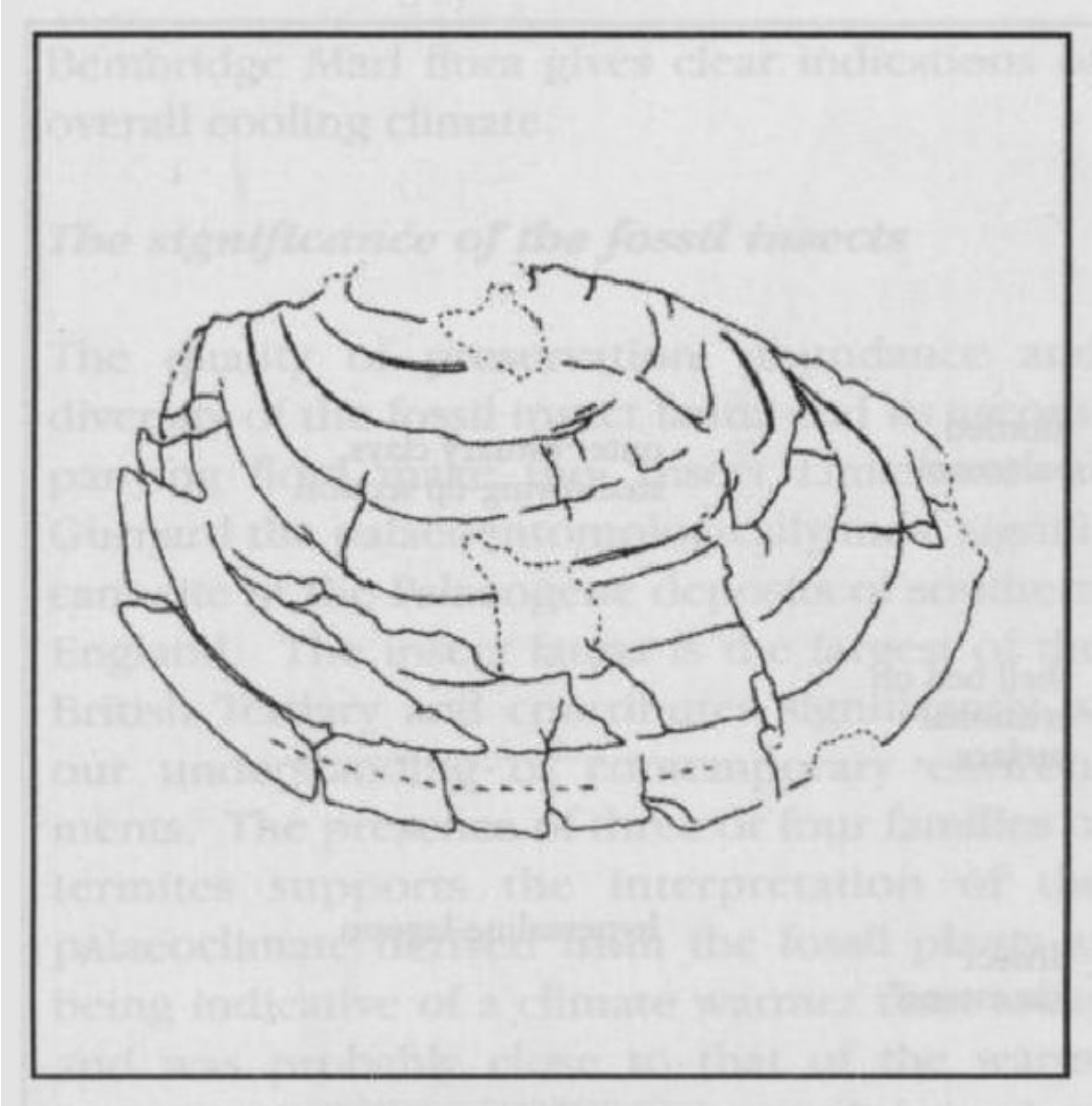
St Helens is a key site for Tertiary fossil insects in Britain from the 'Insect Limestone' with some 220 species known from this horizon, of which the most common is a tree ant *Oecophylla* and the best-known, a termite *Mastotermes anglicus.* This site is unique in Europe for Tertiary conchostracan Crustacea. The arthropods are found within the Bembridge Marls

of late Eocene-early Oligocene age (c. 33 Ma). The site also has great potential for future research in improving our knowledge of the palaeontology of the 'Insect Bed', a unique horizon in the British Tertiary record.

References



(Figure 5.27) Section showing the Insect Bed (B) at St Helen's Church to Node's Point. (After Gale and Self, 2005.)



(Figure 5.28) Clam shrimp (Crustacea, Conchostraca), 4.4 mm wide. BLN 4427 (Maidstone Museum Collection). (Drawn by Self, pers. comm.)