
Pegwell Bay

[TR 348 640]–[TR 363 642]

Highlights

This site in Kent reveals a 40 cm shell bed containing quantities of disarticulated fish debris. It is a fauna rich in shark species and an assemblage of benthonic forms. No other site of comparable wealth in species and individuals of this age (Thanetian) is known in western Europe.

Introduction

Pegwell Bay has long been known for the presence of shark teeth in the Thanet Sands. The section formerly exposed on the northern side of the bay was in Palaeocene Thanet (Sands) Formation has been interrupted by road construction, resulting in smaller sections. At the eastern locality (Cliffs End Section; Ward, 1977) some 7.5 m of the Thanet Formation rests unconformably on Chalk; the western occurrence is now obscured by drift.

Pegwell Bay geology was first described by Prestwich (1852), who coined the term Thanet Sands for the succession of yellowish and pinkish sands, and underlying clayey glauconitic greensands. At the base is a thin layer of green-stained flints (the Bull Head Bed). Whitaker (1866, 1872) preferred the term Thanet Beds on account of the range of lithologies. Other contributions were made by Gardner (1883), Burrows and Holland (1896), White (1928) and by Ward (1977) who summarized the earlier work on the section. The highly fossiliferous character of the beds has attracted attention from Haynes (foraminifera; 1955, 1956–1958; Haynes and El Naggat, 1964), Downie *et al.* (palytomorphs; 1971), Aubrey (nannoplankton; 1983), and others have studied the vertebrates (Stinton, 1965a; Ward, 1977).

The age of these beds, the oldest of the Cenozoic rocks of south-east England, has been determined by isotopic dating of the glauconites (Fitch *et al.*, 1978; see below). Mineralogical work on the Thanet Formation has been carried out by Blondeau and Pomerol, 1968; Brown *et al.*, 1969; Weir and Catt, 1969; Knox, 1979; Wheatley, *in* Shephard-Thorn, 1988.

Description

The succession at Pegwell Bay is some 24 m of poorly consolidated strata, resting unconformably upon Santonian Chalk (see Ward, 1977; Shephard-Thorn, 1988). There has been some discussion as to the age of the Thanet Formation relative to the Herne Bay (q.v.) outcrop. General agreement has it that the Pegwell Bay strata are older than those at Herne Bay, though there may be some overlap; it certainly represents the onset of the Palaeocene marine transgression. Isotopic ages from glauconite in the basal beds at Pegwell Bay have been calculated as 59.5 ± 0.9 Ma (Fitch *et al.*, 1978). Palaeomagnetic data lead to the normal polarity magnetozone of NP6-NP7 and Chron 26N (Aubrey *et al.*, 1986).

Mineralogical investigation of the Pegwell Bay Palaeocene has revealed a component of volcanic materials which are comparable to those in contemporaneous ash falls within the North Sea Basin and the Hebrides (Knox, 1979). This volcanism was probably a strong influence upon the local ecology of the day.

The macrofossil content of these beds is most conspicuous at the horizons indicated in the section (Figure 14.3) and include over 70 species of marine invertebrates, mostly molluscs of boreal aspect. Taylor (*in* McKerrow, 1978) has described the marine sand community which is so widely represented in the Thanet Formation. Water depth was generally less than 50 m and sediment input was from the south and west. There is also a heavy mineral input that suggests a Scottish or Scandinavian source.

The teeth and bones of fishes have long been known from these beds; invariably they are dis-articulated, indicating current activity as well as organic deprivation. The fossils are relatively easily recovered from weathered sediment or by bulk sampling techniques.

Fauna

Chondrichthyes: Elasmobranchii: Neoselachii: Squalomorphii

Squalus minor Leriche, 1902

Chondrichthyes: Elasmobranchii: Neoselachii: Galeomorphii

'*Lamna inflata* Leriche, 1936

Otodus obliquus Agassiz, 1843 *Otodus* sp.

Palaeohypotodus rutoti (Winkler, 1874)

Synodontaspis teretidens (White, 1931)

Striatolamna striata (Winkler, 1874)

Chondrichthyes: Holocephali: Chimaeriformes: Chimaeroidei

indeterminate chimaeroid

Osteichthyes: Neopterygii: Teleostei

indeterminate teeth and bones

Otoliths

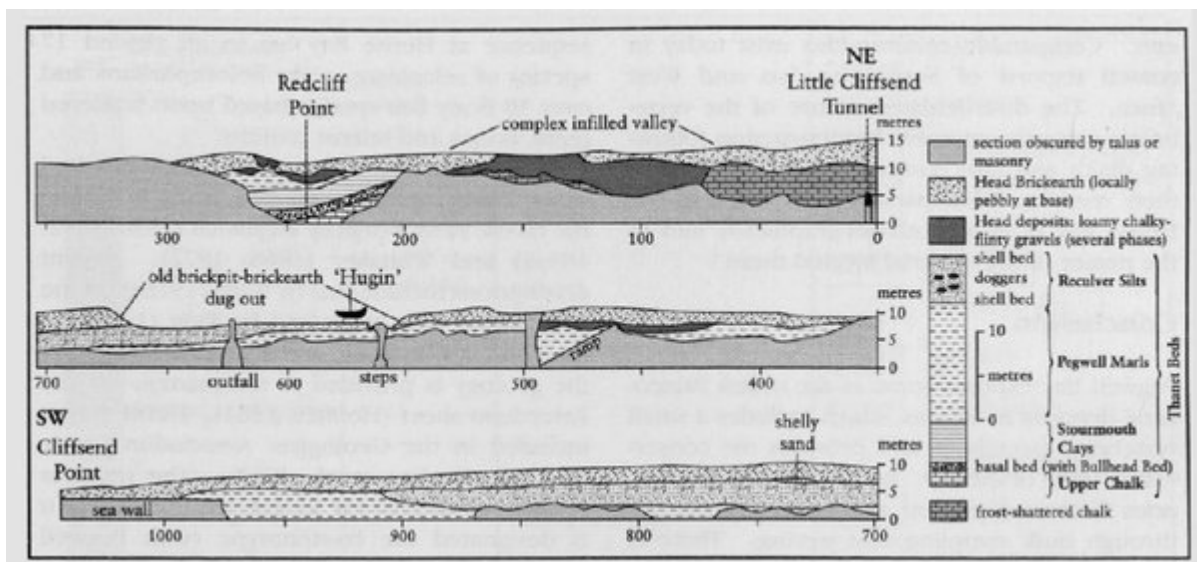
Interpretation

The Cenozoic deposits in this corner of southeast England were laid down on the edge of a marine basin with a broad cyclic regime of sedimentation. Each cycle began with a marine transgression that was followed by a gradual transition to a fluvial or non-marine phase. In Kent, which lay at the margin of the basin, the sequence is thinner than near the basin centre and there were numerous breaks in sedimentation. The Pegwell Bay section appears to indicate sediment accumulation after a relatively short break following the formation of the Chalk. The Palaeocene semi-consolidated terrigenous clastics (Thanet Beds) here contain both body and trace fossils from marine mollusc-dominated invertebrate communities. The Oldhaven and Blackheath Beds show a swing to estuarine and mudflat shallows environments with very abundant benthonic molluscs and high populations of fishes, particularly sharks and rays. Comparable communities exist today in coastal regions of South-east Asia and West Africa. The disarticulated nature of the vertebrates suggests extensive biodestruction following death and also current or tidal working of their remains. Comparable sites are few, but Herne Bay is close both geographically and in the nature of the material located there.

Conclusion

Pegwell Bay exposes some of the oldest Palaeocene deposits in Britain, which includes a small vertebrate assemblage and provides the conservation value of the site. Both bony and cartilaginous fishes are present and collecting may be through bulk sampling and sieving. There is much potential for collecting to continue.

[References](#)



(Figure 14.3) The section of Thanet Beds overlying eroded Chalk exposed in the Pegwell Bay cliffs (after Shephard-Thorn, 1988).