Dinton, Wiltshire

[SU 006 307]

Introduction

Dimon and the adjacent Teffont Evias are two insect-bearing GCR sites in the Purbeck strata (Berriasian, basal Cretaceous age, *c.* 143 Ma) just west of Salisbury in the Vale of Wardour. The Dinton site is a former stone quarry which lies just north of the River Nadder ((Figure 4.55) and (Figure 4.56)) and is of considerable historical importance. It is the main source of the Wealden' (Purbeck) insects described in the first book on fossil insects in the English language (Brodie, 1845b). Brodie's pioneering text 'opened up a new aspect of palaeontology' (Cleevely, 1983). Over 70 insect species and an isopod are known from the locality, all occurring in fine-grained limestone. The original quarry was already abandoned and neglected in the 1830s when visited by the Reverend Brodie and subsequently the exact location became lost. The land was inaccessible for a long time as it was taken over by the Ministry of Defence. However, it has now been made available for public use and Brodie's site was re-discovered by an excavation team from the Nature Conservancy Council in 1983 and the 'Insect Limestone' revealed in subsequent site management work as part of the former English Nature's 'Facelift' programme in 2002. In addition to the fossil arthropod importance of this site, the area is also selected for the GCR for the Portlandian–Berrisian and Wealden selection categories.

Description

The great majority of Brodie's (1845b) insects came from the 'Insect Limestone', which is a *c.* 30 cm thick, blue-grey micrite when fresh and weathering to white. It also has a gritty basal lag of shell and fish debris. Brodie was unable to examine this bed *in situ* and surmised that it lay beneath the Cinder Bed. He was subsequently able to place it with more confidence above the Cinder Bed (Figure 4.57). Temporary excavations by English Nature in 2002 uncovered large fossiliferous blocks of the Insect Limestone and confirmed its stratigraphical position between the Cinder Bed and *Archaeoniscus* Bed, within the Durlston Formation of the Purbeck Limestone Group. Insects occur more rarely in the higher *Archaeomiscus* Bed, the main source of the common isopod species (*Archaeomiscus brodiei*) described from here.

Insect fauna

The insects comprise over 70 species belonging to ten separate orders: Odonata (dragonflies), Blattodea (cockroaches), Orthoptera (grasshoppers and crickets — see (Figure 4.58) and (Figure 4.59)), 'Phasmatodea' ('stick insects'), Hemiptera (true bugs), Coleoptera (beetles), Mecoptera (scorpionflies), Diptera (true flies — see (Figure 4.60)), Trichoptera (caddisflies) and Hymenoptera (wasps) (Ross and Jarzembowski, 1996; Rasnitsyn *et al.,* 1998). The majority of described insect species are unique to this site, although this no doubt simply reflects the incomplete sampling of hyperdiverse Purbeck insect faunas.

Interpretation

The Insect Limestone may well correlate with the lithologically and faunistically simiar 'white fissile limestone' recorded by Andrews and Jukes-Brown (1894) right across the Wardour outcrop of Middle Purbeck limestones, in which case it would have been deposited in a water body at least 5 km across. A degree of marine connection is suggested by the probable presence of glauconite and perhaps the relatively frequent leptolepiform fish, which, in some cases at least, occur in mass-mortality accumulations (Coram, 2005).

However, the presence of *Cypridea* [*Cypris* auct.] ostracods suggests that water conditions were also fairly fresh at times, and the apparent absence of the remains of immature aquatic insects may be explained by stressful salinity fluctuations between fresh- and near-marine waters. Conditions probably never became strongly hypersaline since there is no

evidence of evaporites.

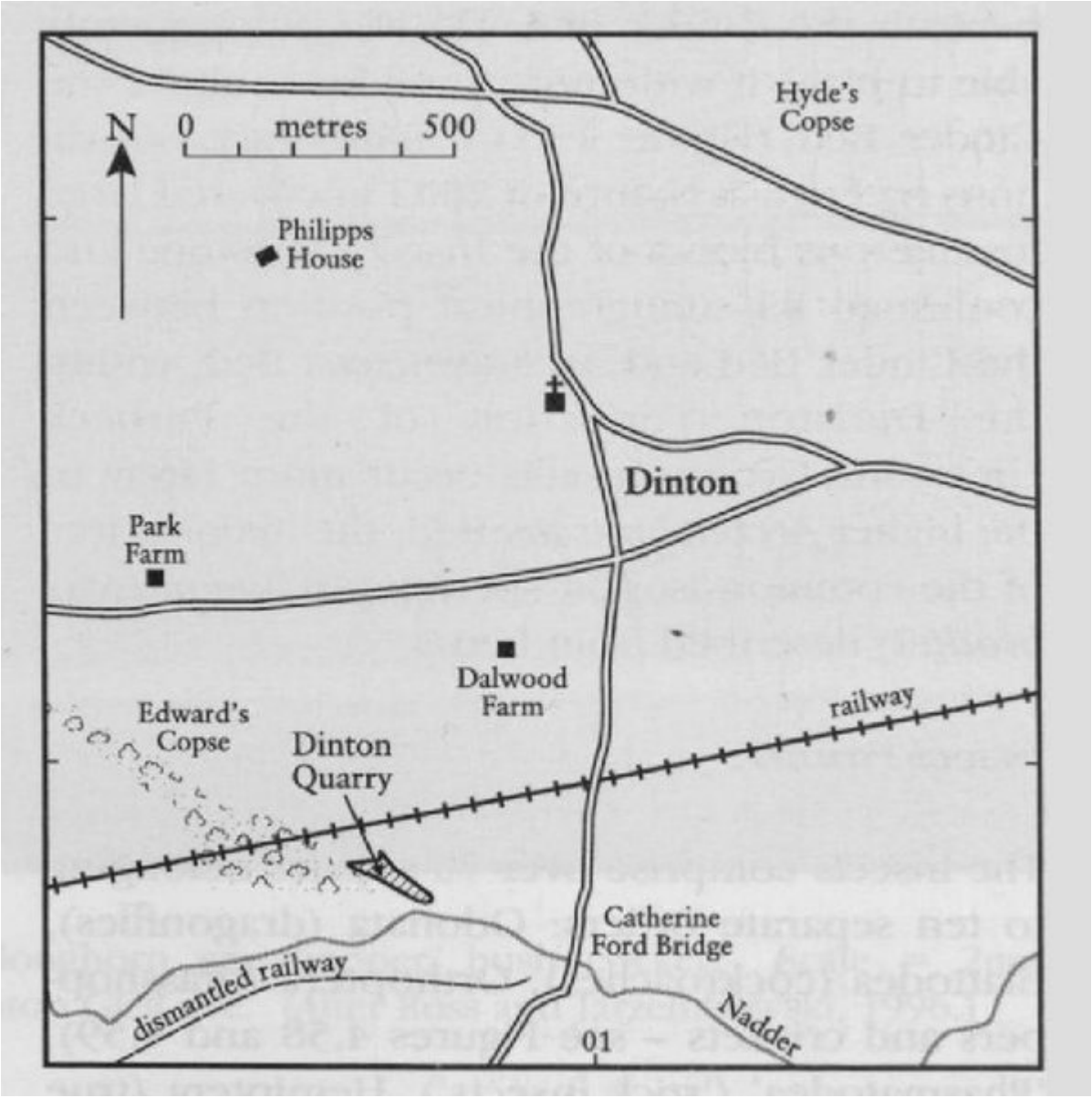
The remains of adult insects such as dragonflies and caddisflies, which have aquatic larvae, indicates that there were also more-stable freshwater conditions locally. A relatively high proportion of intact terrestrial insect fossils, along with common plant remains and abundant quartz grains, suggest that there was emergent land fairly close by (probably to the south).

Conclusion

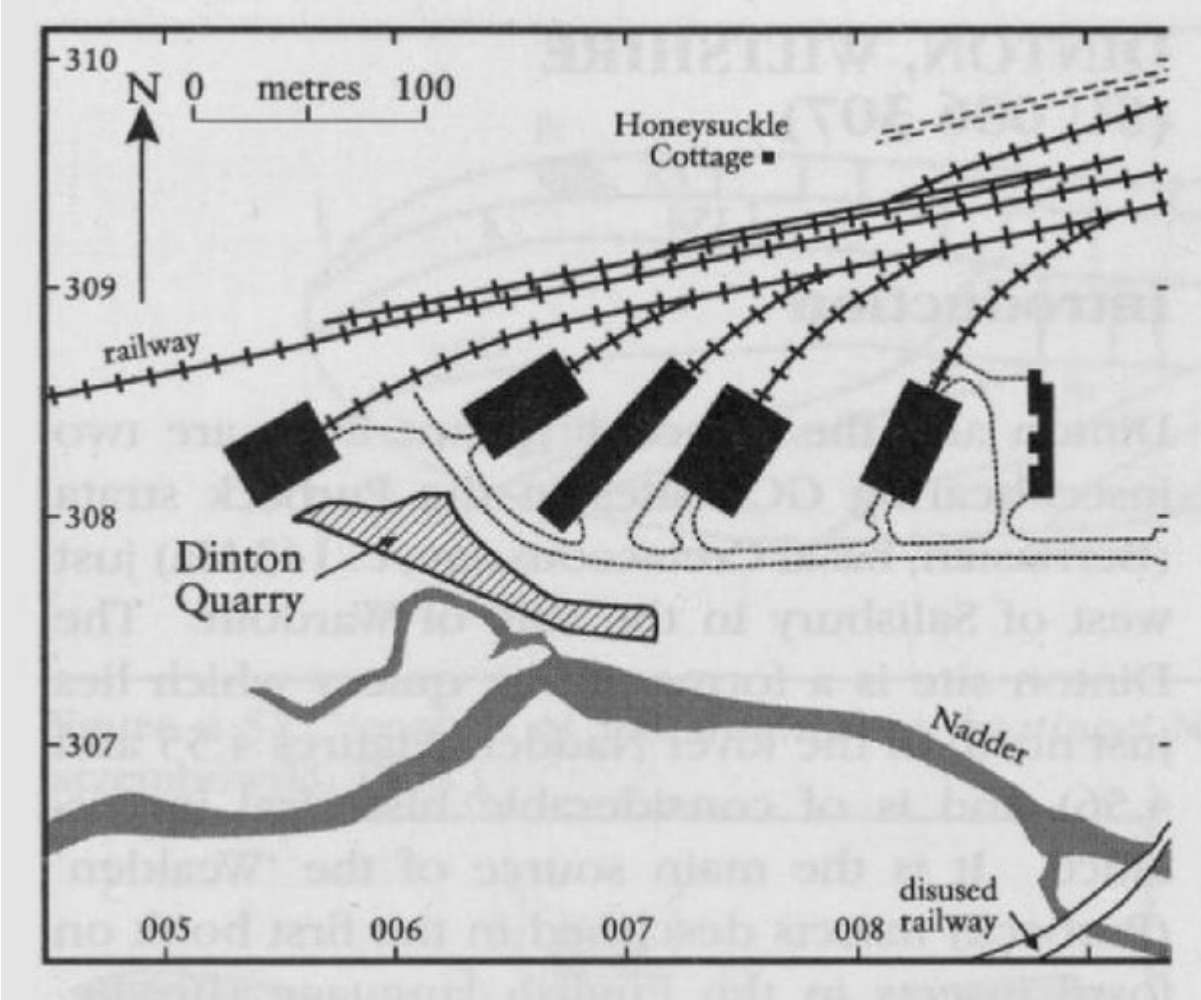
The Dinton GCR site is a locality of international importance from which a rich diversity of fossil insects has been obtained. The insects were found within the Purbeck limestones of the Durlston Formation. The conservation value of the site lies in its historic importance and the potential for further excavation of the site.

This historically important basal Cretaceous site in Middle Purbeck limestones (*c.* 143 Ma) has provided some 70 fossil insects including the type specimens of a number of species belonging to some 10 different orders. They were the main source of the early Cretaceous insects described by Brodie in 1845, in the earliest book on fossil insects in the English language.

References



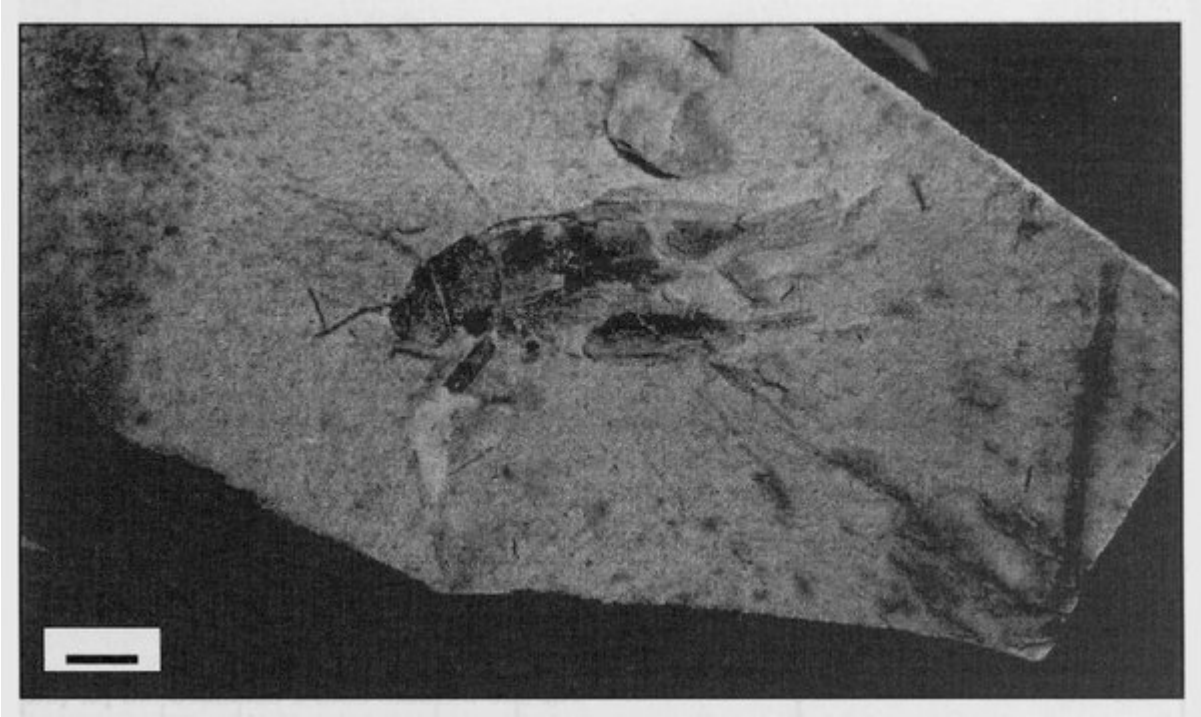
(Figure 4.55) Location of the Dinton Quarry GCR site.



(Figure 4.56) Detailed location map of the Dinton Quarry GCR site.

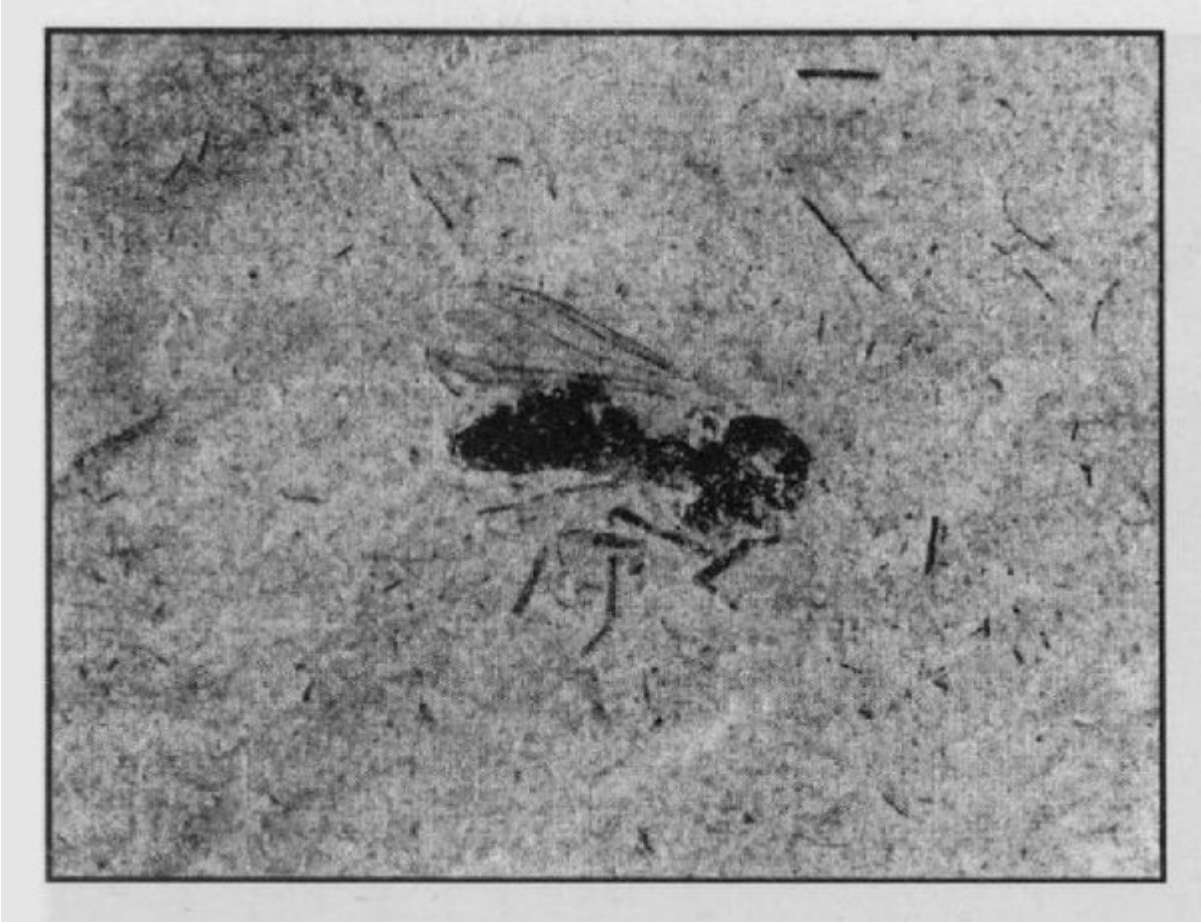
		metres
1.	Clay forming the surface a few centimetres	
2.	White limestone	0.08
3.	Clay	0.05–0.08
4.	White limestone, similar to No. 2, containing shells (chiefly Cyclas), a few Unios and Cypris	0.08–0.10
5.	Crystalline grit with *Cyclas major*	0.05
6.	Clay	0.08
7.	Clay with layers of grit	0.08
8.	Clay	0.05–0.08
9.	Light brown sandstone full of small *Cypris* and *Cyclas*, consisting in the lower part of comminuted shells	0.46
10.	Blue and brown clay with innumerable fragments of shells	0.08–0.10
11.	Thin-bedded grit	0.05
12.	Fibrous carbonate of lime	0.15
13.	Grit	
14.	Fibrous carbonate of lime	
15.	Soft shelly sandstone	0.05
16.	Light brown and blue limestone abounding in the Isopod Crustacean (*Archaeoniscus*), in the lower part laminated with numerous *Cyclas* and oysters	0.15–0.20
17.	Blue compact grit full of impressions of *Cyclas* and oysters	0.05–0.08
18.	White laminated crystalline limestone, very different from Nos. 2 and 4 – probably	0.61
	Total	2.24

(Figure 4.57) The section through Purbeck strata exposed at Dinton as measured by Brodie (1845b) but metricated.



(Figure 4.58) Protogryllus segwickei (Brodie), a cricket Scale = 2mm. Archaeoniscus Bed (Isopod Limestone) from the Dinton GCR site. (From Ross and Jarzembowski, 1996.)

(Figure 4.59) Panorpidium dubium (Giebel), a longhorn grasshopper/ bush cricket. Scale = 2mm. Archaeoniscus Bed (Isopod Limestone) from the Dinton GCR site. (After Ross and Jarzembowski, 1996.)



(Figure 4.60) Olbiogaster fittoni (Brodie), a true fly, x 6. From the Insect Limestone of the Dinton GCR site. (From Ross and Jarzembowski, 1996.)