

Late Pleistocene deposits with a cold stage fauna at Small Dole, near upper Beeding, West Sussex. UK.

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Introduction

The Horton pit lies on a five metre terrace of the River Adur, 1.5km to the north of Upper Beeding, West Sussex (TQ204123). The pit was originally worked for Gault Clay by the British Portland Cement Company during the first quarter of the twentieth century. The clay was excavated by hand during this time and effected the eastwards removal of a low spur projecting into the Adur valley. The first mention of faunal remains from Horton was in 1913 when H.S. Toms reported in the *Sussex Daily News* on the “many interesting geological remains” unearthed that year at the site. The article stated that while the pit had been worked for ten years, deposits capping the Gault Clay were first encountered during 1913 and comprised a gravel bed overlain by peat seams. During that year the remains of bison, mammoth and reindeer were recovered from the basal gravel bed and samples of macroscopic plant remains and beetles were sampled from the overlying peat seams.

Worked ceased at the pit shortly after this visit, no doubt due to start of the First World War and did not begin again until 1924 (Toms 1926). In the previous year, 1923, the geologist Osborne White visited the site and was able to record the stratigraphic sequence which was still partially visible on the eastern wall of the pit. Unfortunately, due to weathering, a large part of this face was obscured by talus and Osborne White could only examine the lower part of the sequence where it had been exposed through rabbit burrowing. His records show that, while all the beds thin to the south, the gravels were limited to the most northern exposure. At the time of his publication the faunal remains discovered in 1913 had been identified and listed as “*Bos primigenius*, *Bison priscus*, *Elephas primigenius* and *Rangifer tarandis*” (Osborne White 1924, 48). Worked recommenced at the pit in 1924 and continued for another 10 years during which time the gravel bed was further exposed and additional faunal remains recovered. The British Portland Cement Company donated these finds to Brighton Museum.

In 1998 beetle remains were extracted from samples of peat from the Pit which were stored at the Booth Museum, Brighton (Coope and Cooper 2000). In all, 38 taxa of Coleoptera were recovered from the samples allowing environmental, climatic and stratigraphic interpretation of the peat to be made. The beetle assemblage indicated a colder and more continental climate than that of present day southern England and the assemblage as a whole appeared to be similar to the fauna from Chelford, Cheshire (Coope 1959). The authors concluded, on the basis of the mammalian fauna, the low height of the terrace and the nature of the coleopteran fauna, that the Horton sequence most probably belonged to an interstadial of the Devensian (Weichselian), possibly the Chelford (Brørup) dated to around c.60,000 B.P, possibly equating with the early part of Marine Isotope Stage 3. In light of these

results further work was undertaken at the site to relocate and determine if any deposits survived at the site.

The Relocation of the Horton Channel

In the year 2000, it was not known whether any Pleistocene deposits remained at the Horton site. The pit had been largely flooded to form a duck pond in the 1960's and other parts were infilled with flue dust from the nearby cement works. The eastern edge of the quarry was still visible, standing some 3m above the water level of the pond. This suggested that deposits might survive along a narrow strip of scrubland between the quarry edge and a recently built access road for the adjacent Viridor landfill site.

Cleaning of the remaining section revealed the overlying chalk pellet gravel along a 5m stretch of the eastern quarry face. The chalk pellet gravel appeared to thin to the south just as described by Osborne White and at one location overlay a peaty clay. This initial inspection proved that the upper part of the sequence at least had been preserved. As talus precluded the further cleaning of this section, it was decided to core immediately to the east of the quarry face. A single 50mm core was sunk close to the edge of the Horton Pit. The sedimentary sequence recovered through coring generally matches Osborne White's intermediate exposure both in terms of stratigraphy and the depth of channel fill. The basal sands and gravels at this location were poorly developed. However, Osborne White recorded that these gravel beds thickened to the north and further fieldwork was proposed to test this hypothesis in the future.

Preliminary analyses of the recovered sediments suggest that the peat layers are characteristically rich in plant and insect remains. The sequence is provisionally interpreted as representing the infilling of a channel of the River Adur cut into the Gault Clay during the Devensian. The basal sand and gravels are consistent with relatively high-energy fluvial deposition, possibly within a braided channel. The overlying clays and interbedded organic horizons suggest that this channel was cut off from the main flow and became infilled through peat formation and alluvial sediments introduced through periodic flooding. The coleopteran fauna from Coope's analysis would indicate that this took place under relatively cool climatic conditions and preliminary analysis of the pollen indicates a local environment of sedge, grass and alder with some open pine woodland beyond the limits of the floodplain (Nick Branch *pers. com.*). The overlying chalk pellet gravel demonstrates a shift to cold, periglacial conditions at the top of the sequence, possibly during Marine Isotope Stage 2.

Bibliography

Coope, G.R. and Cooper, J.A. 2000. Coleoptera from the upper peat bed at Horton clay pit, Small Dole, near Upper Beeding, West Sussex. *Proceedings of the Geologists' Association*, 111(3), 247-252

Coope, G.R. 1959. A late Pleistocene insect fauna from Chelford, Cheshire. *Proceedings of the Royal Society of London* **B151**, 70-86.

Osborne White, H.J. 1924. *Memoirs of the Geological Survey: Geology of the Country near Brighton and Worthing*. British Geological Survey Memoir.

Toms, H.S. 1913. Sussex Geology: What a pit at Upper Beeding may unfold. *Sussex Daily News*, 8th September.

Toms, H.S. 1926. Reindeer in Ancient Sussex. *Sussex Notes and Queries*, vol. 1. Pp17-18