Ham Green

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Highlights

Ham Green has importance as a representative of the 100' terrace of the Avon. The terraces of the Avon are of critical importance because of their relationship with the ancient glacial deposits of the Bath and Bristol areas. The site has easily accessible examples of cold-stage fluvial sedimentation and is the type-locality for the Ham Green Member.

Introduction

At Ham Green, a clear terrace surface at 30–31 m OD at the mouth of the Avon Gorge is underlain by fine, massively bedded and imbricated sandy gravels containing a significant proportion of erratics. This site was selected for the GCR as representative of the 'high terrace' of the Bristol Avon.

The site was first described by Davies and Fry (1929) as part of their 100' terrace. They described a 'considerable tract' of gravel, mostly of lithologies derived from the Jurassic, but with the surface gravels rich in Greensand chert and quartzite pebbles. They recorded 'several feet' of gravel in temporary roadside excavations at Bristol Road, Ham Green, and in the nearby railway cutting. Hawkins and Tratman (1977) suggested that the terraces of the Avon west of Bristol may be degraded estuarine terraces or relic glacigenic deposits. The site was re-investigated in 1984 during the compilation of the Geological Conservation Review. Massively bedded gravels were found which provide evidence for cold-stage sedimentation by a precursor of the Bristol Avon. Like other localities in the 'high' terrace of the Avon, a substantial erratic content was noted. The site was proposed as the type-locality of the Ham Green Member by Campbell *et al.* (in prep.). They tentatively attributed the deposits to some part of Oxygen Isotope Stages 10–12, on geomorphological grounds.

Description

At Ham Green, a broad terrace surface lies about 30–31 m above the Avon, to the south and east of the Hospital. Up to 1.2 m of gravels are exposed in the railway cutting near [ST 539 768], at 31 m OD. The sequence can be summarized as follows (maximum bed thicknesses in parentheses).

4. Dark brown stony loam soil. (0.2 m)

3. Strong brown, massively bedded, stony silty clay, with some large clasts orientated with their A-axes vertical. Clast lithologies include flint, Carboniferous and Greensand chert and quartzites. (0.6 m)

2. Strong brown, massively bedded, clast-supported, imbricated silty gravel. The gravel clasts mostly have B-axes in the size range 10–15 mm. They are predominantly of brown (?Carboniferous) sandstones (24%), Jurassic limestones (oolitic and micritic) and flint (39%), with rarer Carboniferous and Greensand chert (9%), quartzite (5.5%), Carboniferous Limestone (10%), and other lithologies including Triassic mudstone, siltstones, sandstones and vein materials. The quartzite clasts are rounded, the flint and chert clasts predominantly angular and the other clast lithologies are subrounded to rounded. The clast imbrication direction suggests deposition by a current flowing from the south-east (146°). (0.3 m)

1. Strong brown, imbricated very coarse gravels. The clasts have B-axes up to 80 mm. The gravel rests on a gently undulating erosion surface cut in Triassic mudstones and manly limestones. (0.1 m)

During the compilation of the GCR, a temporary exposure was seen in a sewer trench outside the main entrance to Ham Green Hospital at [ST 5330 7563]. The trench exposed 0.4 m of made ground overlying 1.2 m of strong, brown to

red-brown, massively bedded, matrix-supported, cobbly sandy gravel. The cobble-sized clasts were mostly of flint and white and grey quartzite, but smaller gravel clasts included Greensand chert, red and yellow sandstone and ironstone.

Interpretation

The Ham Green site lies on a prominent 'flat' in the landscape at the mouth of the Clifton Gorge of the River Avon. Underlying this 'flat' is a sequence of deposits which can be interpreted as follows.

Gilbertson and Hawkins (1978a) have described silty deposits similar to bed 2 from a number of sites in Avon. They regard these deposits as coversands of predominantly aeolian origin. The stones may have been incorporated into the bed from below by cryoturbation. The high clay content and the presence of only siliceous clasts in the bed are consistent with prolonged exposure to pedogenic processes.

In bed 3, the size, roundness, sorting and imbrication of the gravels are consistent with a fluvial origin. Palaeocurrent data indicate deposition by an ancient precursor of the modern Avon. The coarseness of the sediment and the lack of Quaternary fossils is perhaps suggestive of aggradation under 'cold-stage' conditions, as suggested for terrace gravels elsewhere in southern England (Briggs and Gilbertson, 1980). Bed 1 is most probably a basal lag deposit.

The geomorphology and sedimentology of the site are thus consistent with the deposits being an early fluvial gravel of the Avon, rather than of glacial or estuarine origin, as suggested by Hawkins and Tratman (1977). The altitude of the deposit points to its considerable antiquity, while the pres ence of rock types such as flint and Greensand chert, which have no outcrop in the catchment of the Avon, suggests that the site post-dates glaciation of the area.

In particular, the high altitude of the Ham Green Member points to its considerable antiquity. On altitudinal grounds, it must pre-date the Bathampton Member and Stidham Member in the Avon Valley. The Bathampton Member dates from Oxygen Isotope Stage 6 or earlier (this chapter) and the Stidham Member is thus likely to date from Stage 8 or earlier. Considering the significant down-cutting separating the Stidham and Ham Green members, the latter is thus likely to date from Stage 10 or 12, or quite possibly from an earlier stage. Its maximum age is constrained by the age of the Kenn Formation glacial deposits, which pre-date Oxygen Isotope Stage 15 (this chapter).

Conclusion

An extensive area of the high (100') terrace of the Avon occurs at Ham Green, downstream from the Clifton Gorge. The site is one of a set which conserves the critical geomorphological and stratigraphical elements of the terraces of the Bath Avon. This terrace sequence is important because of its relationship with the ancient glacial deposits of the Bath and Bristol areas. The site provides easily accessible examples of cold-stage fluvial sedimentation.

References