

**MIDDLE PLEISTOCENE TILL
LITHOSTRATIGRAPHY IN SOUTH
BEDFORDSHIRE AND THE HITCHIN GAP.**

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ABSTRACT

A revised lithostratigraphy and glacial history of north Hertfordshire and south Bedfordshire is based upon detailed textural data in the clay to fine gravel fraction, carbonate content, small clast lithological data and macrofabrics, derived from laboratory and field analyses of tills from 30 sites. These include four deep boreholes sunk within the Hitchin Gap. A range of statistical procedures was used, including multivariate analysis of the petrographic properties, enabling the identification of tills from two separate incursions into the Gap. A further till-type was identified in south Bedfordshire indicating an ice advance from the northwest/NNW extending at least as far east as Milton Bryan. Statistical comparison with tills in the neighbouring Vale of St. Albans suggested the presence of the Ware Member till within the Gap.

Two hypotheses are suggested to explain variations in lithological content of tills north of the Chalk scarp. The first envisages ice entering the study area along the different trajectories suggested by Fish and Whiteman (2001). During the early part of the glaciation, ice reaching the west of the study area would approach from the north, crossing a shorter distance over Chalk bedrock and collecting less chalk and flint than ice moving into the eastern part of the study area. The second hypothesis invokes an incursion of ice from a northwest - NNW direction into the west of the study area, depositing a chalk-free till. This is subsequently assimilated by ice from the northeast, resulting in the final deposition of a homogeneous mixture of debris from the two advances, with a lower chalk content than tills found to the east. The outcome of either of these scenarios is a till with a low acid-soluble content and low flint/quartz ratio in the west of the study area, as found during this work.

Within the Hitchin Gap, a lobe of ice, probably an early part of the northeasterly advance, deposited a lower till. This is considered to be earlier than the Ware Member till and has more variable lithological characteristics and a finer matrix than the higher tills. The latter are mainly melt-out, flow or slumped tills with occasional instances of lodgement and deformation. They represent *in situ* wasting of dead ice within the Gap. Surface tills in the Gap form a continuum

with tills to the north and comprise mainly deformation tills, deposited by the final northeasterly re-advance of ice responsible for widespread coverage of the region, with the exception of the Chiltern Hills southwest of Hitchin. No evidence is found of more than one lithostratigraphic unit of till outside the Hitchin Gap.