Part 3 The Sequence post-dating the diversion of the Thames (Sites in the Middle Thames and its tributary, The Kennet)

D. R. Bridgland

Introduction

This part of Chapter 3 is concerned with the terrace deposits laid down by the Thames since its diversion into its modern course. The Black Park Gravel Formation, aggradation of which occurred while Anglian ice persisted in the Vale of St Albans, post-dates the diversion and so is included at the beginning of this section, represented at Highlands Farm Pit and Hamstead Marshall Gravel Pit (the latter in the tributary Kennet valley). Subsequent to its diversion, the history of the river is recorded in the Middle Thames basin by an extensive sequence of terrace gravels, in marked contrast to the paucity of depositional evidence from the immediate pre-Anglian period (see Part 2 of this chapter).

The history and extent of research on this sequence is considerable. Prestwich (1855) divided the valley gravels into high-level and low-level terrace deposits, but the first systematic account of the drift geology of the Thames valley in which the importance of depositional river terraces was recognized was by Whitaker (1864, 1889). He identified three distinct terraces, which he illustrated in a map of the Maidenhead district (Whitaker, 1889, p. 391). This work, extended by Pocock (1903), formed the basis for the tripartite terrace system — Boyn Hill Terrace, Taplow Terrace and Floodplain Terrace —recognized by the Geological Survey from 1911 (Bromehead, 1912), the type localities for which occur in the Beaconsfield district (Sherlock and Noble, 1922). Upper and lower divisions of the Floodplain Terrace were recognized by Dewey and Bromehead (1921).

When the (higher) Winter Hill Terrace was added to the Middle Thames sequence (Saner and Wooldridge, 1929; Wooldridge, 1938; Wooldridge and Linton, 1939), it was thought to follow the modern valley through London. It was later discovered that the Winter Hill Terrace, as originally defined, was multiple. The lowest division of this multiple terrace, the Black Park Terrace of Hare (1947), was later recognized to be the first gravel formation in the modem Thames valley (Wooldridge and Linton, 1955; Gibbard, 1979). Hare (1947), who carried out detailed geomorphological mapping around Slough and Beaconsfield, recognized that there was a further important aggradation between the Boyn Hill and Taplow Terraces, forming his Lynch Hill Terrace (Table 3.3). Both of these newly defined terraces had previously been subsumed within rather broader definitions of those already established. Hare's work was extended upstream by Sealy and Sealy (1956) and Thomas (1961), the latter taking the new scheme into the tributary Kennet and Blackwater–Loddon valleys, and downstream by Allen (1978).

(Table 3.3) Post-Winter Hill terraces and gravel formations in the Middle Thames and Kennet valleys.

Thames		Kennet	
Terrace	**Gravel formation**	**Terrace**	**Gravel formation**
Lower Floodplain	Shepperton	Beenham Grange *	*
Upper Floodplain	Kempton Park	within Thatcham?	*
Taplow^{+}	Taplow^{+}	Thatcham^{+}	*
Lynch Hill	Lynch Hill	*	*
Boyn Hill	Boyn Hill	*	*
Black Park	Black Park	Hamstead Marshall	Silchester
Winter Hill	Winter Hill	Upper Winter Hill of Thomas (1961)	*

* not separately named.

+ lower and upper (geomorphological) divisions of the Taplow and Thatcham Terraces were recognized by Sealy and Sealy (1956) and Cheetham (1980) respectively. The validity of these is doubtful (see Fern House Pit).

Hare had recorded a minor, lower facet of the Taplow Terrace, which Sealy and Sealy (1956) subsequently redefined as a separate 'Lower Taplow Terrace', Hare's Taplow Terrace becoming their 'Upper Taplow Terrace'. Gibbard (1985) found the Upper Taplow Terrace to be formed by the fluviatile Taplow Gravel plus an overlying loessic silt (brickearth), whereas the Lower Taplow Terrace is formed by the same gravel, but with no overburden. Thus the lower of the two terraces recognized by the Sealys is the true fluviatile Taplow Terrace (see below, Fern House Pit).

Allen (1978) recognized an additional 'Stoke Park Terrace' in the Yiewsley area, between the Boyn Hill and Lynch Hill Terraces. He regarded this as a downstream extension of the minor erosional facet identified by Hare (1947) as the 'Stoke Park Cut'. Gibbard (1985) again rejected this as an additional aggradational terrace, pointing out that the gravel assigned by Allen to the Stoke Park Terrace probably represents the northern feather-edge of the Lynch Hill Formation, separated from the thicker part of the Lynch Hill sequence immediately to the south by diapirically uplifted London Clay.

Gibbard (1985) has provided a recent reappraisal of the Middle Thames terrace sequence, basing his work on studies of the deposits rather than surface morphology. He combined the reconstruction of the sediment bodies that form the various terraces with clast-lithological analysis of the gravels to establish a lithostratigraphical scheme. As (Table 3.2) illustrates, there is a progressive decline in the exotic (far-travelled) component of the post-diversion Thames gravels, a trend that began following the deposition of the Gerrards Cross Gravel. Gibbard considered individual terrace aggradations to be of member status, emphasizing the role of clast composition in their differentiation. Bridgland (1988b, 1990a) argued instead that the principal basis for recognizing individual terrace aggradations is mapping; therefore each forms a mutually exclusive primary lithostratigraphical unit and should be regarded as a separate formation (see Chapter 1). Comparable lithostratigraphical schemes have been used to classify fluvial sequences in adjacent areas, providing a reliable mechanism for the description and correlation of terrace formations (Gibbard, 1977, 1978a, 1982, 1989; Allen, 1983, 1984; Bridgland, 1983a, 1983b, 1988a; Bridgland and Harding, 1985; Cheshire, 1986a; Gibbard *et al.,* 1988). The terms Boyn Hill Gravel and Taplow Gravel (Bromehead, 1912), already used on most New Series Geological Survey maps of the area, have been retained for the Middle Thames. Gibbard (1985) extended this nomenclature to include the additional terraces recognized by Hare (1947), establishing a parallel stratigraphical scheme but retaining Hare's placename nomenclature (Table 3.3) and (Figure 3.1). He also provided names for the deposits underlying the Upper and Lower Floodplain Terraces, respectively his Kempton Park and Shepperton Gravels (Gibbard *et al.,* 1982; Gibbard, 1985; (Table 3.3)).

The stratigraphical scheme developed for the Middle Thames terraces has frequently been used to classify the gravel spreads of the Kennet valley, particularly since Thomas (1961) traced the terraces defined by Hare (1947) and Sealy and Sealy (1956) upstream to the Newbury area. White (1907) had previously provided local names for the higher gravels of the Kennet, equivalents of the Winter Hill, Gerrards Cross and older gravels of the Thames. Chartres *et al.* (1976), Cheetham (1980) and Chartres (1981) subsequently proposed a separate nomenclature for terraces in the Kennet valley. Gibbard (1982) used a modified version of White's term — 'Silchester Gravel' — to describe the terrace sediments in the Kennet valley that equate with the Black Park Gravel of the Middle Thames. Correlation with Middle Thames formations is not problematic, because the gravel-bodies can be traced and/or projected between the two valleys and the Thames sequence is well-preserved in the confluence area. The use of Thames nomenclature, except where correlation is problematic, would seem perfectly feasible therefore.

The Kennet sequence falls into two clear groupings. Firstly, the older gravels recognized by White (1907) are preserved as wide spreads that form a southward-declining sequence. This sequence culminates in the Silchester/Black Park Gravel, which caps extensive plateaux to the south of the modern river. Later deposits are much less extensive, perhaps because the Kennet became entrenched along the line of its present valley. Equivalents of the Boyn Hill and Lynch Hill Formations are poorly represented in the Kennet, being restricted to a few degraded patches of gravel either side of the valley near Brimpton (Figure 3.1). Later formations are better preserved, remnants of Thatcham Terrace deposits (= Taplow Formation) occurring at Thatcham and Brimpton (see below, Brimpton), while Beenham Grange (Floodplain)

Terrace (= Shepperton Gravel) deposits are well preserved at and downstream of Thatcham.

References

Thames		Kennet	
Terrace	**Gravel formation**	**Terrace**	**Gravel formation**
Lower Floodplain	Shepperton	Beenham Grange	*
Upper Floodplain	Kempton Park	within Thatcham?	*
Taplow*	Taplow*	Thatcham*	*
Lynch Hill	Lynch Hill	*	*
Boyn Hill	Boyn Hill	*	*
Black Park	Black Park	Hamstead Marshall	Silchester
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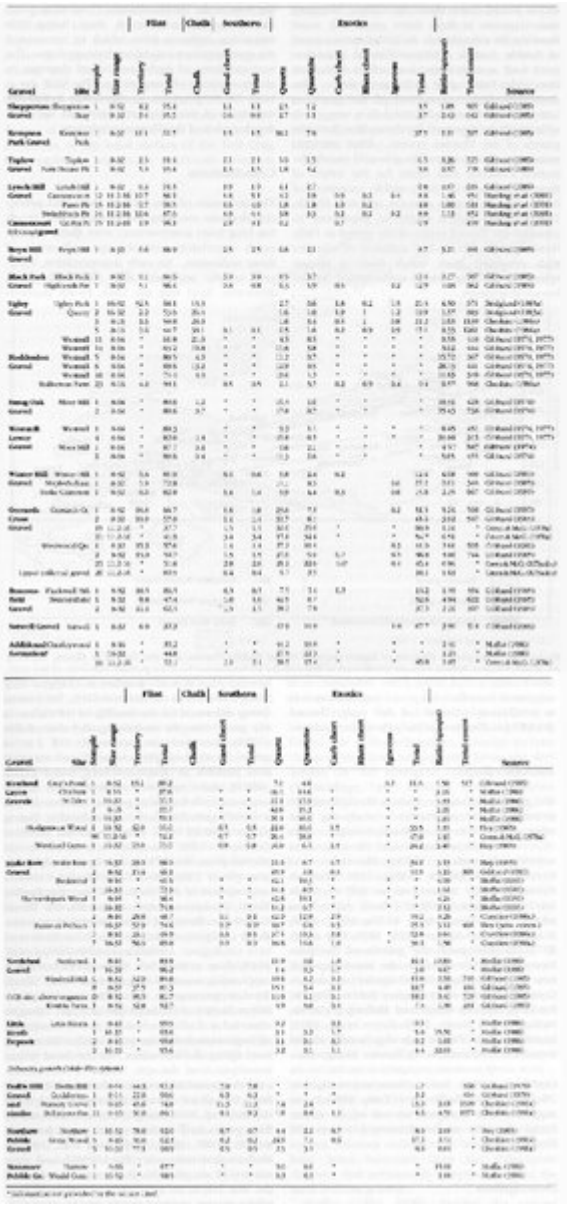
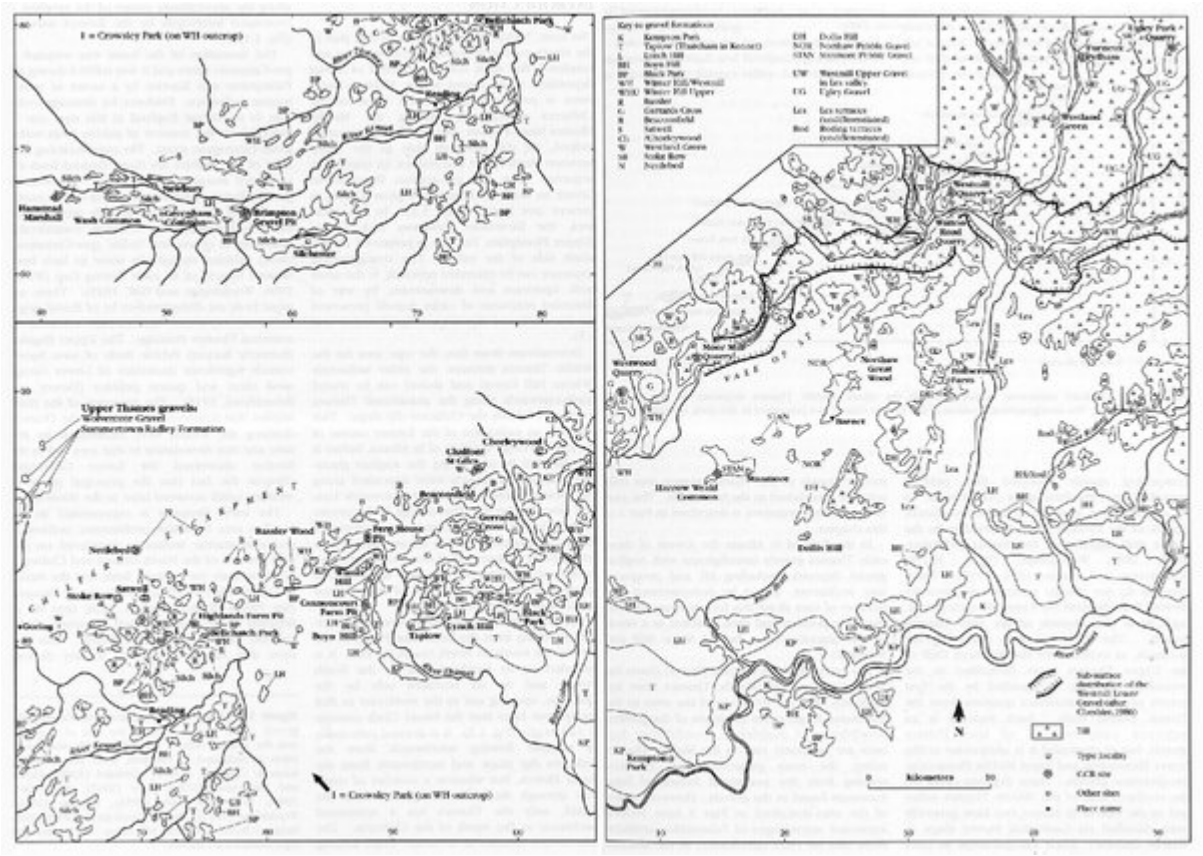
* not separately named.
* lower and upper (geomorphological) divisions of the Taplow and Thatcham Terraces were recognized by Sealy and Sealy (1956) and Cheetham (1980) respectively. The validity of these is doubtful (see Fern House Pit).

(Table 3.3) Post-Winter Hill terraces and gravel formations in the Middle Thames and Kennet valleys.



(Table 3.2) Clast-lithological data (in percentage of total count) from the Middle Thames and Vale of St Albans (compiled from various sources). The data concentrates on key sites, GCR sites and localities mentioned in the text. Note that many different size ranges are included and that these yield strikingly different data (this can be observed where results from different fractions from the same deposits have been analysed). As in (Table 4.2), (Table 5.1) and (Table 5.3), the igneous category includes metamorphic rocks (very rarely encountered) and the quartzite category includes durable sandstones. The Tertiary flint category comprises rounded pebbles (sometimes subsequently broken) reworked from the Palaeogene (see glossary with (Table 4.2)).



(Figure 3.1) (Following two pages) Map showing the gravels of the Middle Thames, the Vale of St Albans and the Kennet valley. Compiled, with reinterpretation as indicated in the text, from the following sources: Cheshire (1986a), Gibbard (1985), Green and McGregor (1978a), Hare (1947), Hey (1965, 1980), Sealy and Sealy (1956), Thomas (1961), Wooldridge (1927a) and the Geological Survey's New Series 1:50,000 and 1:63,360 maps. GCR sites and type localities are shown.