BRITISH GEOLOGICAL SURVEY

TECHNICAL REPORT WA/89/22

Onshore Geology Series

TECHNICAL REPORT WA/89/22

SP28SW

Meriden

Part of 1:63:360 Sheets 168 (Birmingham) and 169 (Coventry)

M G Sumbler

Geographical index
UK, C England, Warwickshire,

Subject index
Geology, Quaternary, Triassic,
Upper Carboniferous, Cambrian

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Sumbler, M G. 1989
Geological notes and local details for 1:10 000 sheets: SP28SW (Meriden)
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 Keyworth, Nottingham British Geological Survey 1989

CONTENTS

SUMMARY

The geology of sheet SP28SW (Meriden) is described, with emphasis on significant exposed sections and borehole logs. The Cambrian and most of the Carboniferous rocks are not represented at outcrop, and are known only from boreholes. Graphic logs of the cored sections of these boreholes are presented. The Carboniferous rocks occur on the west side of the Warwickshire Coalfield and are terminated by the Meriden Fault. The Triassic rocks to the west are heavily drift covered and are poorly known.

Details are given of the lithologies and thicknesses of the drift deposits with diagrams to show their thickness and the elevation of the sub-drift topography.

Attention is drawn to the mineral resources of the area, and a schedule of boreholes is appended.

INTRODUCTION

This account describes the geology of 1:10 000 Sheet SP28SW (Figure 1). The area was first geologically surveyed on the one-inch scale by H H Howell and A C Ramsay, and is included in Old Series One-Inch Sheets 54NE and 62SE, published in 1855. The solid geology of the area is briefly described by Howell (1859).

The area was surveyed on the six-inch scale by C H Cunnington and T Eastwood in 1913 and 1915, and is included in one-inch (or 1:50 000) New Series sheets 168 (Birmingham) and 169 (Coventry), first published in 1924 and 1922 respectively. Explanatory memoirs for these sheets have been published (Eastwood and others 1923, 1925). The whole area was resurveyed on the 1:10 000 scale by M G Sumbler in 1980, with revisions by K M Bardell, R A Old and J G Rees in 1987-88. The work was supported by the Department of the Environment through its membership of the Geological Survey Consortium, and this report, originally published in 1982, has been revised in connection with a subsequent contract with the Department.

A BGS drilling programme to investigate the sand and gravel resources of this, and adjacent districts, carried out in 1980-81, is described in Cannell (1982).

The area is situated midway between Coventry and Birmingham, on the western margin of the concealed Warwickshire coalfield. It is largely given over to agriculture. The coalfield boundary fault system runs roughly north-south through Meriden. To the east, the Enville Group, with major feature forming sandstones, forms the highest ground of the area, reaching over 160 m OD. Westwards, the ground slopes gently down to heights of around 90 to 100 m OD. Most of this ground is underlain by Mercia Mudstone, although a few inliers of Bromsgrove Sandstone outcrop along the boundary fault system. The River Blythe, a tributary of the Tame, runs from south to north through the western part of the area, and near Hampton-in-Arden, the Arden Sandstone, the only mappable horizon within the Mercia Mudstone, forms steep riverside bluffs. A large part of the Mercia Mudstone outcrop, mainly east of the River Blythe, is concealed beneath thick glacial and fluvio-glacial sand and gravel, which has been extensively worked for aggregate. Along the Blythe valley, these

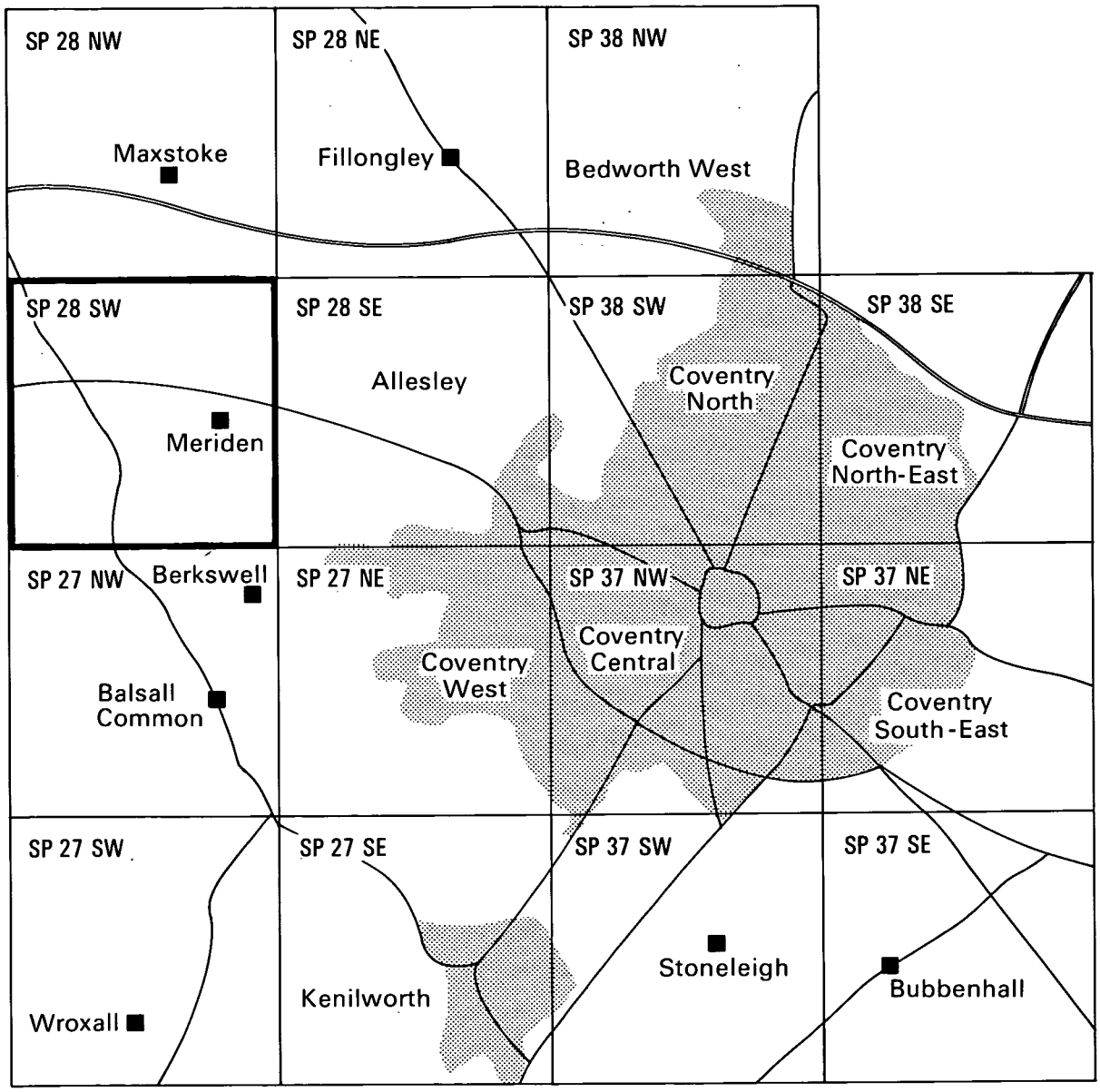

Figure 1. Area of this report relative to area of whole contract is shown with bold outline

deposits have apparently been partly reworked by the river, which has cut a broad bench at around 96 m OD. River terrace deposits are not well developed in the Blythe valley, except for first terrace gravels and loams, which commonly border the floodplain. The relationship between the terrace deposits and the alluvium indicates that the River Blythe has a complex history.

Similar reports covering adjoining sheets are:

SP18SE	Elmdon (Sumbler, 1982)
SP27NW	Berkswell and Balsall Common (Old, 1987)
SP28NW	Maxstoke (Old, 1989)
SP28SE	Allesley (Rees, 1989)

GEOLOGICAL SEQUENCE

The geological sequence represented in the area, either proved at the surface or in boreholes, or inferred from adjacent areas is as follows:

DRIFT		
Quaternary		
	Alluvium	River Deposits
	First Terrace Deposits	
	Second Terrace Deposits	
	Fluvio-glacial Sand and Gravel	Glacial Deposits
	Glacial Sand and Gravel	
	Boulder Clay	
SOLID		
Triassic		
	Mercia Mudstone Group	Arden Sandstone
		Undivided red mudstone
	Sherwood Sandstone Group	Bromsgrove Sandstone Formation
		Kidderminster Formation (at depth only)
Carboniferous		
	Enville Group	Tile Hill Mudstone Formation
		Coventry Sandstone Formation
		Keele Formation
		Halesowen Formation
	(at depth only)	Etruria Marl Formation
		Productive Coal Measures (at depth only)
Cambrian		
		Merevale Shales (at depth only)

CAMBRIAN

Boreholes drilled by British Coal in this and adjacent areas show that the Carboniferous rocks of the Warwickshire Coalfield are underlain by Cambrian sediments. The British Coal Berryfields Farm (1977) Borehole [2498 8148] proved 9.10 m of green-grey fissile mudstone with some thin (c. 5 mm) sandy and silty layers, below the base of the Productive Coal Measures at 1003.70 m. The mudstone yielded acrotretid and linguellid brachiopods, suggesting a horizon at, or above, the base of the Merevale Shales (Tremadoc) of the Nuneaton district. The beds also yielded abundant acritarchs, which suggest a late Middle Cambrian to early Upper Cambrian age.

CARBONIFEROUS

Upper Carboniferous (Westphalian) beds from the Productive Coal Measures up to the Enville Group occur at outcrop, or have been proved by boreholes, east of the Meriden Fault. They rest unconformably on the Cambrian basement. The Carboniferous sequence beneath the Triassic west of the Meriden Fault is unproven in this area, although limited seismic data suggests that the sequence is similar.

The Westphalian Series is divided into four stages, A-D in ascending order. This chronostratigraphic subdivision is difficult to apply rigorously in Warwickshire, due to the lack of palaeontological evidence at some horizons. The base of Westphalian B is defined by the Vanderbeckei (Seven Feet) Marine Band, which occurs just above the Seven Feet (and Thin) coals in the northern part of the coalfield. In this area, it is absent, but its horizon probably lies close below the Thick Coal. The base of Westphalian C is drawn at the Aegiranum (Nuneaton) Marine Band which has not been found within this area, although it has been proved to the east (Rees, 1989). Its absence in this area is due to the Etruria Marl facies occuring at this stratigraphic level (Fulton and Williams, 1988). Due to paucity of fossil evidence, the position of the Westphalian C-D boundary is uncertain, but it probably corresponds approximately with the base of the Halesowen Formation. No Carboniferous beds younger than Westphalian D are represented in the area.

Productive Coal Measures

The upper part of the Productive Coal Measures was penetrated in the Packington Borehole [2471 8479], drilled in the early part of this century, but the only information for the whole sequence from this area comes from the Berryfields Farm Borehole (Figure 2), for which the detailed written log is confidential. The thickness of the Productive Coal Measures is about 130 to 140 m; Westphalian A being of the order 40 to 50 m thick, and Westphalian B perhaps 80 to 90 m thick; Westphalian C is largely represented by Etruria Marl.

The Productive Coal Measures are predominantly composed of mudstones, with a few sandstones in some parts of the sequence. A number of coal seams occur, the most important being the composite Thick Coal, near the base of Westphalian B. The identification of the other named seams (Figure 2) is tentative.

In the Packington Borehole, 36.6 m of Productive Coal Measures was penetrated below the base of the Etruria Marl at 575.8 m as follows:

	Thickness (m)	Depth (m)
Base Etruria Marl		575.8
Grey marl	5.8	581.6
Soft grey marl with thin coal beds	0.9	582.5
Grey sandy marl	3.6	586.1
Coal (?Half Yard)	1.2	587.3
Fireclay	0.5	587.8
Grey sandy marl	3.9	591.7
Dark grey shale	6.2	597.9
Coal; with a 0.23 m dirt band 0.23 above base, and a 0.20 m dirt band 0.68 above base (?Four Feet)	1.8	599.7
Fireclay	1.7	601.4
Black shale with fireclay bands	0.9	602.3

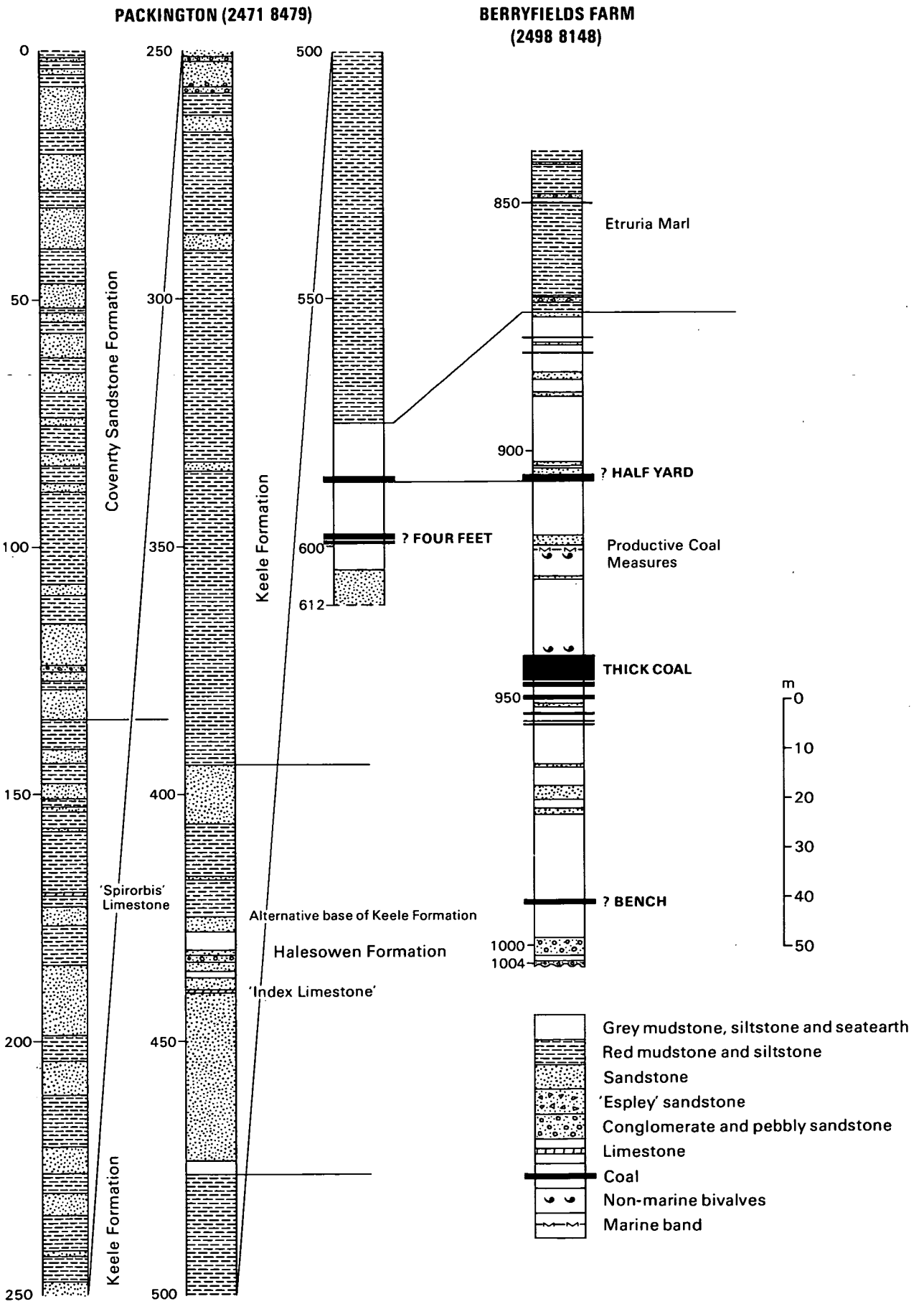

Figure 2. Comparative Westphalian successions in cored boreholes

Grey sandy shale	2.7	605.0
Grey shaly sandstone	5.4	610.4
Grey sandstone with thin coal 'veins'	1.9	612.3

Etruria Marl Formation

The Etruria Marl Formation is probably entirely of Westphalian C age. It consists of red-brown and grey mottled mudstones and siltstones, with mudstone flake breccias, and a few grey beds of Productive Coal Measures aspect, including rare inferior coals. The mudstone flake breccias ('pellet rocks') are probably mainly intraformational, but may include flakes of Cambrian Shale. The coarse sandstones and breccias ('espleys') characteristic of the Etruria Marl in the northern part of the Warwickshire Coalfield are almost entirely absent in this area.

In the Packington Borehole the Etruria Marl was 101.1 m thick, and in the Berryfields Farm Borehole c. 137.5 m. The boundary between the Etruria Marl and the underlying Productive Coal Measures is diachronous and gradational, with sporadic reddish and ochreous stained beds occurring below the lower limit of the more consistently red Etruria Marl.

Halesowen Formation

The Halesowen Formation marks a return to an environment similar to that in which the Productive Coal Measures were laid down. Its base is very sharp, and unconformable on the Etruria Marl, accounting for some of the thickness variation of the latter (Mitchell 1942, p.13, Old and others, 1989).

The Formation consists predominantly of grey sandstone, particularly in its lower part, together with mudstone and thin coal seams. The base of the Formation in the Packington Borehole is placed where grey mudstone passes down into red Etruria Marl mudstone (Figure 2). The boundary was not cored at Berryfields Farm and the base has been taken below the thick basal sandstone recognisable on geophysical logs.

In the Packington Borehole the top of the Formation is taken above a grey sandstone at 394.4 m, but the mudstones beneath to 426 m are described in the log as 'red and blue marl', and their base could be taken as the top of the Halesowen Formation (Figure 2). These alternatives give thicknesses of 82 and 51 m respectively for the Formation. At Berryfields Farm the top of the Halesowen is tentatively placed at 681 m, below which the chipping samples are predominantly grey, giving a thickness of 54 m for the Formation.

The basal sandstone is 34.6 m thick in the Packington Borehole and 33 m in Berryfields Farm, and is the equivalent of the "100 ft sandstone" of earlier writers (e.g. Eastwood and others, 1923). It is overlain in the Packington Borehole by 0.15 m of grey 'Spirortis' limestone which is probably the Index Limestone, a marker widely developed in the Warwickshire Coalfield (Eastwood and others, 1923, p. 73). The limestone is overlain by 14.7 m of grey, gritty and 'shaly' sandstone interbedded with grey sandy mudstone, followed by 'red and blue marl'.

Keele Formation

The Keele Formation probably averages about 275 m in thickness in the area, although its lower and, more particularly, its upper boundaries are rather indefinite. In the Packington Borehole it is 260.0 m thick, and in the Berryfields Farm Borehole, c. 293 m. It consists predominantly of red mudstones with subordinate beds of red and grey sandstone, which are more common in the upper part of the formation. In the Packington Borehole, mudstone flake conglomerates ('pellet rocks') occur at several horizons. According to Eastwood and others, (1923, pp 89-90), the Maxstoke Spirorbis Limestone lies at 170.1 m in the borehole, i.e., 224 m above the base of the Keele Formation. Possibly the same Limestone was mapped at outcrop just to the west by C.H. Cunnington, but no trace of this band could be found during the present survey and the outcrop shown on the map is taken from Cunnington's survey.

Enville Group

Two formations have been recognised within the Group in this area. The lower - the Coventry Sandstone Formation - probably averages about 400 m in thickness, of which the uppermost 300 m come to crop. There is some evidence that the Formation thickens northwards at the expense of the overlying Tile Hill Mudstone Formation. Near Berkswell, just south of the sheet margin, geophysical logs of British Coal boreholes suggest that the Coventry Sandstone is approximately 300 to 320 mm in thickness (Old 1987), but in the Berryfields Farm Borehole, which commenced very close to the top of the Formation, c. 388 m of Coventry Sandstone was proved.

The Coventry Sandstone Formation consists essentially of alternating sandstone and mudstone beds, in about equal proportions. Individual sandstone beds are commonly up to 10 m thick, and are dominantly red-brown in colour, although some minor grey colouration results from secondary reduction. The sandstones vary from fine grained and flaggy, interbedded with mudstone, to coarse grained and massive, commonly with mudflake breccias in their lower part. The mudstones are almost exclusively red-brown in colour, though some are spotted green-grey. At outcrop, the sandstones form loamy soils, commonly with a sandstone brash, and the thicker ones form strong topographic features. The mudstones give rise to red clay soils. Individual beds of both sandstone and mudstone are lenticular, and can rarely be traced any great distance, making structural interpretation somewhat uncertain. However, mapping and borehole evidence suggests that the upper and lower parts of the Formation contain relatively more mudstone and less sandstone than the middle part, and recognition of these broad subdivisions has permitted the mapping of several faults.

In the Packington Borehole, a Spirorbis limestone occurs at a depth of 17.6 m, i.e., 116.8 m above the base of the Formation (Eastwood and others, 1923 p 73).

In an old quarry [2474 8380], 3 m of apparently massive, coarse, red-brown sandstone is exposed, dipping south at c. 15°. This dip may be partly due to cross-bedding, as the general dip in the area appears to be south-easterly.

The brash on the valley sides near Berryfields Farm [246 814; 248 811] and, in particular, immediately east of the margin of the area [801 814] contains a significant amount of silicified wood, in association with sandstone. This wood is variously black, red and cream coloured. The structure of the original wood can generally be clearly seen on weathered surfaces, though it is usually rather obscure in cross-section due to recrystallisation. Mapping shows that the fossil wood originates from a single sandstone bed which, near Berryfields Farm [246 814], includes a lens of conglomerate with clasts of Carboniferous Limestone and Spirorbis limestone (Eastwood and others, 1923 p 87).

The only other locality in the region where such fossil wood has been found is at Allesley [301 805], about 5 km to the east, in the "Allesley Conglomerate" (Eastwood et al 1923, p 87), close to the top of the Coventry Sandstone Formation. Here, the wood has been identified as *Cordaites brandlingi*. The occurrence in the present district undoubtedly represents the same bed.

Probably about 50 m of the overlying Tile Hill Mudstone Formation crop out in the south east of the area. The Formation is similar to the Coventry Sandstone in its lithologies, but contains a higher proportion of mudstone relative to sandstone, perhaps about 70%.

TRIASSIC

The Triassic rocks were laid down in the Knowle Basin, which is bounded to the east by the Meriden Fault and associated sub-parallel north-south faults. All these faults were probably active in Triassic times and the Triassic formations probably thicken westwards. The uppermost part of the Bromsgrove Sandstone Formation and nearly the full thickness of the Mercia Mudstone Group are represented at outcrop. Borehole and seismic evidence from adjacent areas, suggests that the Bromsgrove Sandstone is underlain by older Triassic strata (probably Kidderminster Formation) which may exceed 400 m in thickness, thinning eastwards to zero as the Meriden Fault is approached, where the Bromsgrove Sandstone probably rests directly on Upper Carboniferous rocks (Old 1987, 1989).

Bromsgrove Sandstone Formation

The uppermost 20 m or so of the Bromsgrove Sandstone crops out in faulted inliers west of the Meriden Fault. Lower beds are unproved in this district, but the Formation may be 200 m or more in thickness, probably thining eastwards towards the Meriden Fault.

The Formation consists of sandstone, with subordinate beds of mudstone. The sandstones are generally grey to green grey, but weather to buff, pink and brown. They are mostly soft, poorly cemented, fine to medium grained and commonly micaceous. The mudstones are red-brown or green-grey in colour, and are commonly sandy or silty to varying degrees. The Bromsgrove Sandstone gives rise to a sandy loam soil. It rarely, if ever, gives rise to a sandstone brash, although lumps of sandstone are often thrown out from ditches.

Immediately west of the Meriden Fault at Cornet's End [2393 8114], uppermost Bromsgrove Sandstone is exposed in a ditch. It consists of interbedded green-grey fine sandstone and red mudstone. The beds are highly disturbed and broken, due to the proximity of the fault, but appear to dip gently westward, the dip increasing as the fault is approached.

Cunnington (1913) noted exposures in two quarries now largely obscurred. At Meriden Hall [2420 8175], he recorded 6 m of medium grained yellow-white sandstone, massive and false bedded, with much mica, irregularly bedded with red marl. Near Old Hall Farm [2418 8287], he noted 2.4 m of grey-brown coarse, friable sandstone, often maganese stained, the lowest part being very friable, coarse and greenish and containing pellets of green marl and small black pebbles; the sandstone rested on 0.6 m of pinkish red marl. Cunnington believed this exposure to fall within the Enville Group, but his description, its westerly dip and evidence from the present survey all suggest that it is Bromsgrove Sandstone.

Around Cornet's End [232 809] a number of confidential gravel trial bores have terminated in Bromsgrove Sandstone beneath drift. The evidence of these bores suggests that the outcrop is limited westwards by a fault, which probably

passes through the disused eastern section of Cornet's End Gravel Pit. The quarry manager reports that blocks of sandstone were dug from the pit floor near Keepers Cottage [233 810].

MERCIA MUDSTONE GROUP

From borehole and seismic data in adjacent areas, the full thickness of the Mercia Mudstone Group hereabouts is estimated to be of the order of 350 to 400 m. The bulk of this is represented in the present area, only the uppermost part (including the Blue Anchor Formation) being absent. The Group consists mainly of red-brown mudstones, giving rise to a red clay soil, with a few thin green grey mudstone and siltstone beds (skerries).

The only mappable subdivision is the Arden Sandstone Member, an estimated 300 m above the base of the Group. It is unlikely that all of this 300 m of strata reaches outcrop in the area: there is a faulted contact between the Mercia Mudstone and the Bromsgrove Sandstone to the west of the Meriden Fault, and other sub-parallel faults with a westward downthrow may occur in the drift-covered ground to the west.

The Mercia Mudstone outcrop is dotted with small pits where the mudstone was dug for brickmaking and 'marling' the soil, but these are now mostly overgrown, and the only major section of the red mudstones is at Jackson's Brickworks (Arden Brick Co. Ltd.). The quarry [205 826] is about 15 m deep but, as the beds dip at c. 5° to the north east, a total of about 25 m of beds are exposed. The precise stratigraphic position of the section within the sequence is uncertain, although it probably lies close above the Arden Sandstone. The composite section is as follows:-

27	Mudstone, red-brown, many green spots and a few larger patches; slightly shaly on weathered face	4.5
26	Mudstone, silty, darker, slightly purplish red-brown, hard, abundant green spots	0.1
25	Mudstone, red-brown, many green spots; rather shaly where weathered	1.1
24	Mudstone, darker slightly purplish brown; many green-grey sandy streaks and spots	0.1

23	Mudstone, silty, red-brown, with many green spots and small solution voids	0.4
22	Mudstone, red-brown, scattered green spots; soft, rather shaly where weathered	0.8
21	Mudstone, darker slightly purplish red-brown; breaks into small angular fragments	0.3
20	Mudstone, red-brown, soft shaly	0.35
19	Mudstone, sandy, purplish-brown, many green spots, hard	0.35
18	Mudstone, silty, red-brown; hard and massive in uppermost 0.1 m, softer, shaly below	0.3
17	Mudstone, purplish-brown, fairly hard, blocky	0.3
16	Mudstone, silty red-brown, very soft, a few green spots	0.05
15	Mudstone, red-brown, some green spots; massive, blocky	0.6
14	Mudstone, purplish-brown; fairly soft, blocky	0.6
13	Mudstone, red-brown, very small green spots; massive, blocky; many 'pin-prick' voids	0.8
12	Mudstone, silty, red-brown, very soft; a few green spots	0.05
11	Mudstone, silty purplish-brown, fairly hard; grey along fissures; 0.1 m band of softer mudstone 0.2 above base	0.8
10	Mudstone, red-brown, many green spots in basal 0.1; slightly sandy, especially at base; many 'pin-prick' voids	0.5
9b	Sandstone, green-grey, weathering pink on surface, medium grained; very soft; many solution voids; thickness varies at the expense of bed 9a	0.1
9a	Mudstone, very sandy, green-grey	0.1
8	Mudstone, red-brown, many small green spots; slightly shaly on weathered face; larger green-grey patches form vague bed c. 1.1 m above base	2.0
7	Mudstone, brown, some green spots; hard, massive, well jointed several vertical sets; thin (a few cms) vaguely laminated layers and lenticles seen on weathered surfaces	1.3
6	Mudstone, red-brown, vaguely layered	0.4
5	Mudstone, silty, brown; hard, massive, well joined	1.0
4	Mudstone red-brown, with abundant green spots and mottles	0.3
3	Mudstone red-brown, slightly shaly on weathered faces; some greenish patches in 3 vague beds, each c. 15 cm thick, about 1 m, 2.5 m and 3.5 m above base; sharp base	4.5

2	Mudstone, green-grey, fairly hard	0.1
1	Mudstone, red-brown, weathers slightly shaly; many small green spots and a few larger patches	3.5
	Obscured to water level	2.0

Beds 9a and 9b, and to a lesser extent bed 2, form striking colour bands in the face. Beds 4 to 7 inclusive form a hard band, but this has no significant topographic expression in the adjoining fields.

An exploratory borehole, drilled for the North Warwickshire Water Co. in 1903 (SP28SW/181), is sited near Mouldings Green Farm [218 822] and a summary log given on the map. A more complete log is given by Butler and Lee (1943, p 68). The exact borehole site is uncertain, but the presence of probable Arden Sandstone at a depth of 42.4 m suggests that a fault separates the borehole and an outcrop of Arden Sandstone mapped 0.3 km to the south [218 819].

Arden Sandstone Member

The Arden Sandstone consists of pale green-grey sandstone, siltstone and mudstone, interbedded with red mudstone. At several localities, dark grey mudstones have been noted. The thickness of the member is variable, but probably reaches up to 10 m. In the area to the west there is some evidence that it thins to zero (Sumbler 1982); such thinning may account for the apparent absence of the bed between Molands Bridge [220 820] and Little Packington [220 847]. No evidence was found for the outcrops in this area shown on the current One Inch Sheet 168 (Birmingham) (1924 edition).

The Arden Sandstone forms bold features on the western flank of the Blythe Valley near Hampton in Arden. Here, it includes a bed of red mudstone, perhaps several metres thick. The beds above the red mudstone include much fine sandstone, but the beds beneath are made up dominantly of green-grey siltstone and mudstone.

South of Hampton in Arden, debris from a gas pipeline trench [2040 8018] to [2048 8009] consisted largely of thinly bedded green-grey siltstone and grey

sandstone, commonly ripple-marked, with thin mudstone layers bearing shrinkage cracks. An exposure in the stream to the south [2073 8010] showed 0.4 m of green-grey silty mudstone beneath First Terrace loam.

Arden Sandstone caps the steep bluff at Siden Hill Wood. Old pits, presumably for building stone, occur at the north end of the wood [2123 8073]; all are now filled, but pieces of grey sandstone can be found in the debris. The lower part of the member crops out at the base of the bluff; in a ditch (from [2137 8065] northwards), interbedded red mudstone and green-grey mudstone and siltstone were exposed to a maximum depth of 0.5 m.
In a shallow cutting on Meriden Road, Hampton in Arden [2155 8145], pale to dark green grey thinly bedded siltstone is poorly exposed over a distance of about 80 m. To the north east [2127 8157], green-grey sandstone and siltstone forms the bed of the River Blythe. In the adjacent river bank, 1 m of red mudstone is exposed above 1 m of interbedded pale green-grey siltstone and mudstone.

The steep river bluff south west of Mouldings Green Farm [214 818] is capped by Arden Sandstone, which forms a dense brash of green siltstone and pale grey sandstone in the fields. Cunnington (1913) recorded an exposure of red marl with a coarse whitish green sandstone at the top, containing fish scales. The Arden Sandstone has been quarried at two sites nearby [2147 8182; 2168 8189].

A skerry, probably the Arden Sandstone, crops out in the valley west of Diddington Lane. Pieces of grey sandstone occur amongst red mudstone debris in an old pit [2076 8223], and 0.5 m red and green-grey mudstone is exposed in the stream to the north east [2069 8231]. The outcrop has been mapped as a north eastward dipping inlier, bounded by a fault to the south west. No evidence was found to justify the continuous outcrop of Arden Sandstone between this point and the outcrops at Hampton in Arden (described above) as shown on the current edition of One-Inch Sheet 168.

The Arden Sandstone is brought to crop by faulting in the Blythe valley at Little Packington [220 848]. The presence and position of the faults which bound the outcrop to the south west and north, beneath alluvium and terrace gravels, are inferred from the evidence of gravel trial boreholes. In the backface of an old quarry [2187 8452], a section showed 0.1 m of grey flaggy

sandstone beneath 0.3 m of red and green-grey laminated mudstone. The base of the Arden Sandstone was exposed in the river bluff close to the north [2191 8468]. Above red mudstone, the section showed:

Red blocky mudstone with green lenticles	0.1
Green grey shaly mudstone	0.1
Pale to dark grey siltstone with scattered sand grains	0.1

QUATERNARY

GLACIAL DEPOSITS

The glacial deposits mapped in the district have been classified (somewhat arbitarily) as Glacial Sand and Gravel, and Fluvio-Glacial Gravel. The latter has only been recognised in the eastern part of the district, where it clearly post-dates the Glacial Sand and Gravel. The possibility that some of the high level deposits designated 'Glacial Sand and Gravel' west of the River Blythe are in fact consanguineous with the Fluvio-Glacial Gravel cannot be discounted. The thickness of these deposits is shown in Figure 3.

Glacial Sand and Gravel

Glacial Sand and Gravel covers a broad north-south trending swathe of ground on the east side of the river Blythe; and is overlapped by fluvio-glacial gravels along its eastern margin. West of the Blythe, scattered outliers occur on hilltops, and the north west part of the district includes the south eastern corner of a broad tract of glacial sand and gravel that stretches several kilometres to north and west. The deposits give rise to sandy soil, invariably containing scattered pebbles. In sections, however, they are seen to vary widely in lithology, through all intermediates between fine silty sand and poorly sorted boulder gravel. Pebbles are dominantly of Bunter quartzite, with some Triassic sandstones (Bromsgrove and ?Arden Sandstone), and extremely rare flints. Boulders of Cambrian quartzite and Enville Sandstone have been dug from the base of the deposit at Cornet's End. Shotton (1977, p 18) also records granite, rhyolite, ignimbrite, andesite and andesitic tuff from North Wales, the Lake District or Scotland.

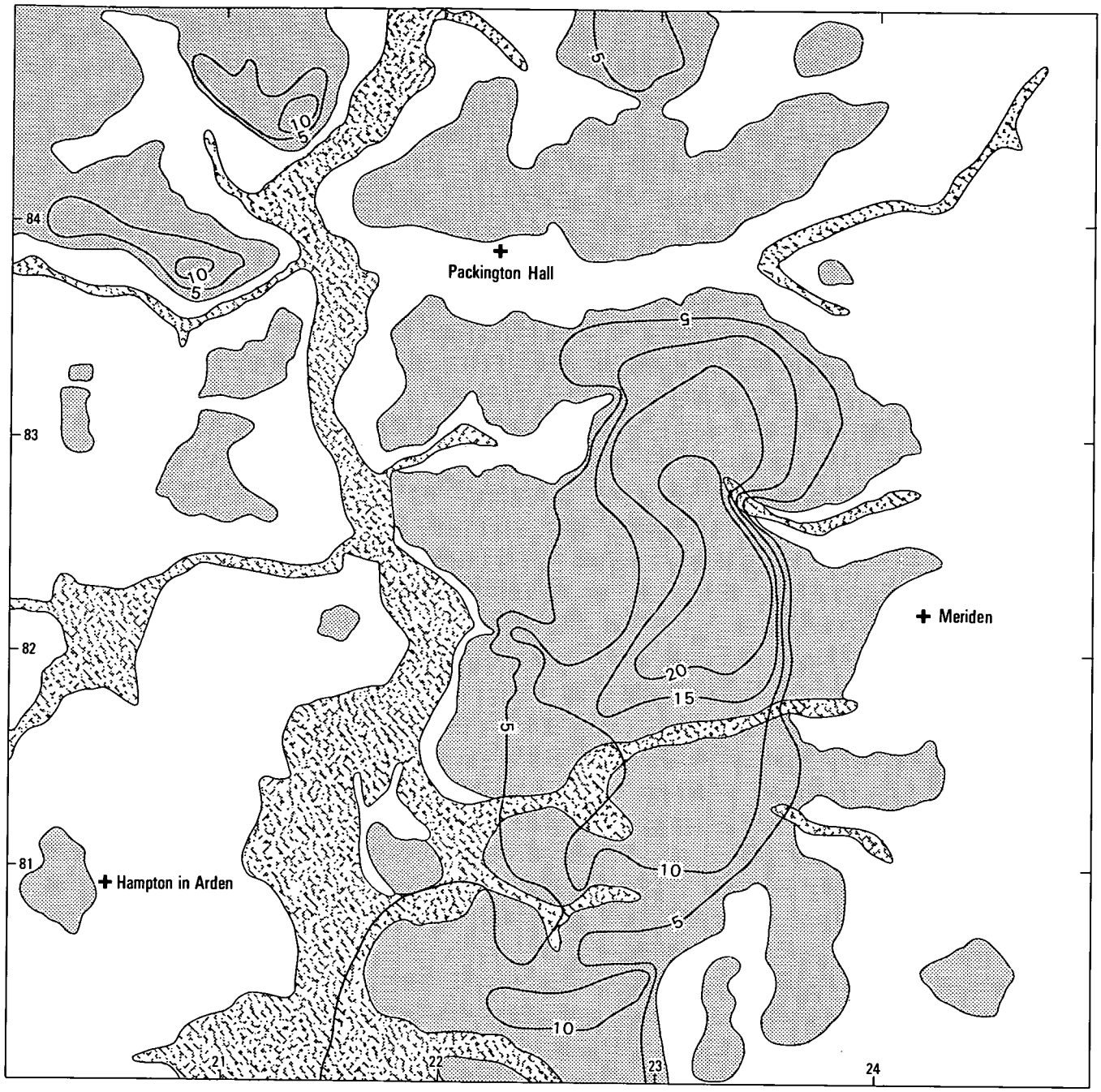

Figure 3. Thickness of drift

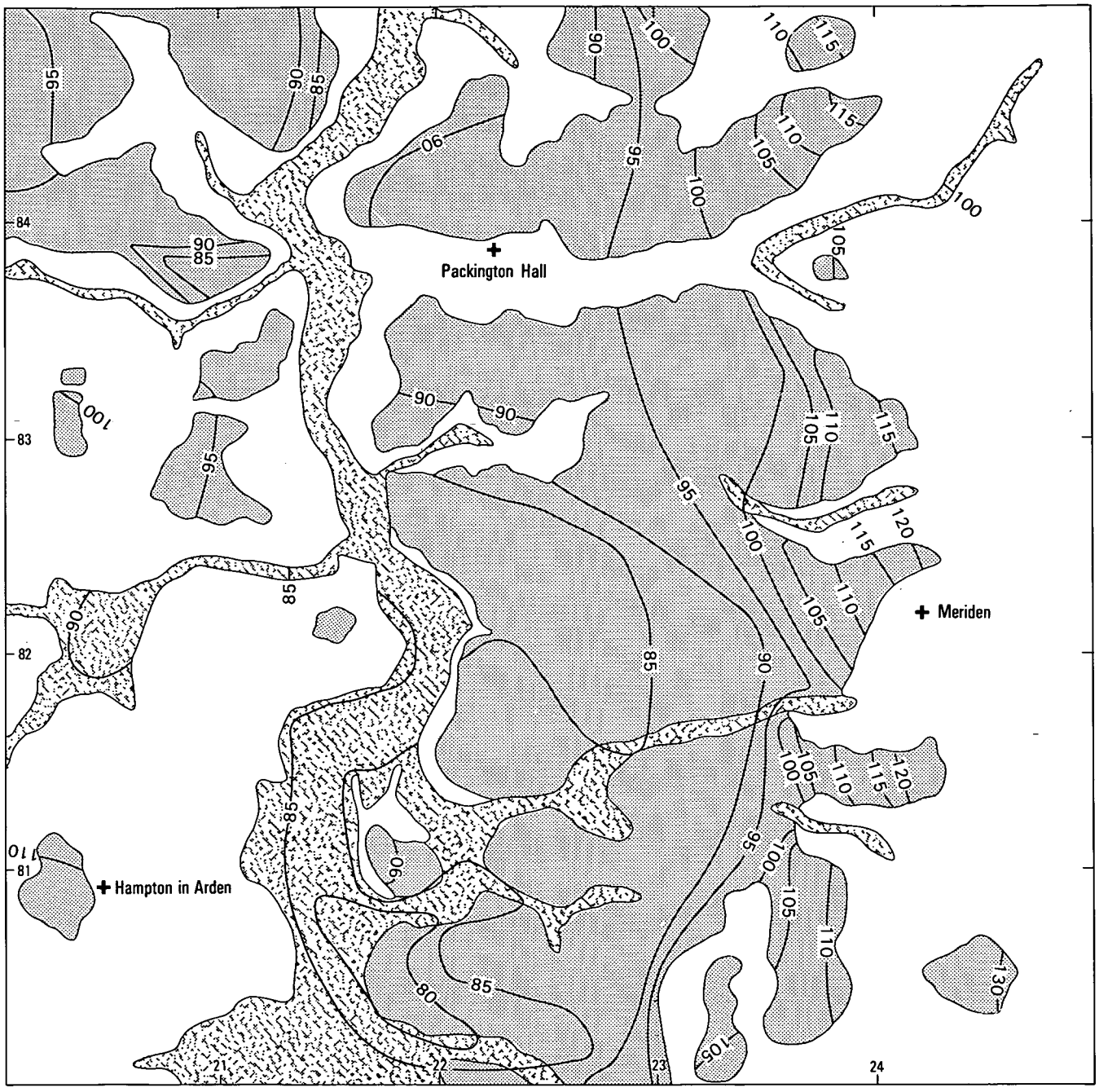

Figure 4. Rockhead elevation at the base of the drift

An attempted reconstruction of the bedrock topography, beneath the glacial drift, based on outcrop levels and borehole data is given in Figure 4. In the south, the main element in this topography is an elongate depression, up to 1.5 km across. Along its eastern margin, the bedrock falls steeply (locally perhaps at up to 15°) from around +120 m OD to below +80 m OD in the base of the depression. A portion of the western margin of the depression is preserved south and east of Patrick Farm [217 810], but elsewhere has been destroyed by the cutting of the Blythe valley. In the north, information is less complete, but the base of the Glacial Sand and Gravel appears to dip gently towards the Blythe valley, the dip steepening in the valley itself, suggesting that the modern valley follows the line of the more ancient depression, and has cut down below its base.

Cross-bedding in the Glacial Sand and Gravel at Cornet's End [233 813] and the Somers [225 823] dips southwards indicating deposition from the north which accords with the pebble and boulder content of the gravels. However the floor of the depression undulates or falls gently northwards suggesting that the deposits infill a pre-glacial valley or depression and its infilling represents the course of a sub-glacial channel.

A number of sections of Glacial Sand and Gravel have been recorded at Meriden Quarry, Cornet's End [233 814], operated by Tilcon Ltd. A composite section of the 1980 working face, (around [2357 8155]) was as follows:

	m
Sand, loamy, rusty-brown, fine to medium grained; level-bedded, in units up to several centimetres thick; some thinly laminated beds; some dark brown, highly ferruginous partially cemented units; a few better sorted cross-bedded units, up to 1.5 m thick	3.5
Clay, brown, soft, plastic with Bunter quartzite and green Triassic siltstone pebbles; lenticular, forming a layer of contorted pods	up to 0.3

Sand, orange-brown, fairly well sorted, cross-bedded; some redder clayey layers; scattered Bunter quartzite pebbles and coal specks	1.3
Sand, orange-brown, well sorted, with small blue-black ferruginous spots; some cross-bedded units; a few strings of Bunter quartzite and Triassic mudstone and siltstone pebbles; some lenses of black peaty material near base	3.5
Clay, sandy and silty, brown, plastic, with pebbles as above; lenticular up to	1.0
Sand, as above, poorly exposed down to water level	5.0

Farther west in the pit, the basal sand is more pebbly, and boulders of up to 0.3 m across have been dredged from the base of the deposit by dragline. In a ditch immediately east of the face, 1.3 m of red-brown, poorly bedded silty clay, with a few layers of brown silt and rare Bunter quartzite pebbles, was exposed beneath fluvio-glacial gravels. This material does not appear in the pit face, and seems to be restricted to the margins of the sand, possibly representing reworked Mercia Mudstone from the channel walls.

Shotton (1977, p 18) recorded a section of the pit, showing 4 m of level-bedded sands ('Upper lacustrine sands'), underlain by 3.5 m of coarser level bedded yellow sand with gravel layers ('Middle Sand Series'), in turn underlain by up to 12 m of cross-bedded coarse gravel and sand ('Lower Gravel Series'). The thickness of the Glacial Sand and Gravel in the sections described above is up to 19.5 m. The deposits are overlain by Fluvio-Glacial Gravel at about +80 m OD, implying a total original thickness of about 28 m. A graphic section of the 1988 working faces is shown in Figure 5.

In 1987 the gravel pits to the south of Cornet's End Lane, operated by Western Aggregates Ltd., exposed much more varied deposits than those to the north.

At the north end of the workings the following section was seen [2259 8097]:

		m
Gravel, clayey with Bunter quartzite pebbles, in pods of periglacial origin		0 to 1.8
Sand, red-brown, clayey and pebbly		0 to 1.8
Sand and gravel, clayey		0.5
Sand, red-brown with bands up to 10 cm rich in coal	(seen)	1.5

At the south end of the workings the section was [2257 8032]:

Sand, brown, pebbly with Bunter quartzites and a few flints		2.3
Sand, brown, ferruginous in part very rich in silt-grade coal		0.5
Sand, brown, cross-bedded with a few beds rich in coal including coal pebbles up to 4 cm	(seen)	1.5

At the Somers [224 824], about 1 km to the north west, extensive workings in Glacial Sand and Gravel are now flooded, and used as a coarse fishery. At the southern end of the workings [2257 8207] there are rather degraded exposures showing up to 5 m of horizontally bedded and trough cross-bedded brown sand with seams of pebbles. Borehole records show that, in the workings, the deposits were up to 11.6 m thick, extending down to about +82 m OD. The deposits proved in the boreholes are laterally very variable, but consist dominantly of sand (as described above), commonly underlain by more gravelly beds. The worked section was generally overlain by 1 to 2 m of brown and grey silty and clayey sand overburden, locally underlain by leached grey-white gravelly sand which rarely extends more than 2.4 m below the ground surface. It is possible that these upper beds represent glacial deposits reworked by the River Blythe (see below), or Head derived from the fluvio-glacial gravels to the east.

A small area of sand and gravel workings to the east of Somers Road is largely backfilled, and no exposures remain. In the eastern part of the pit

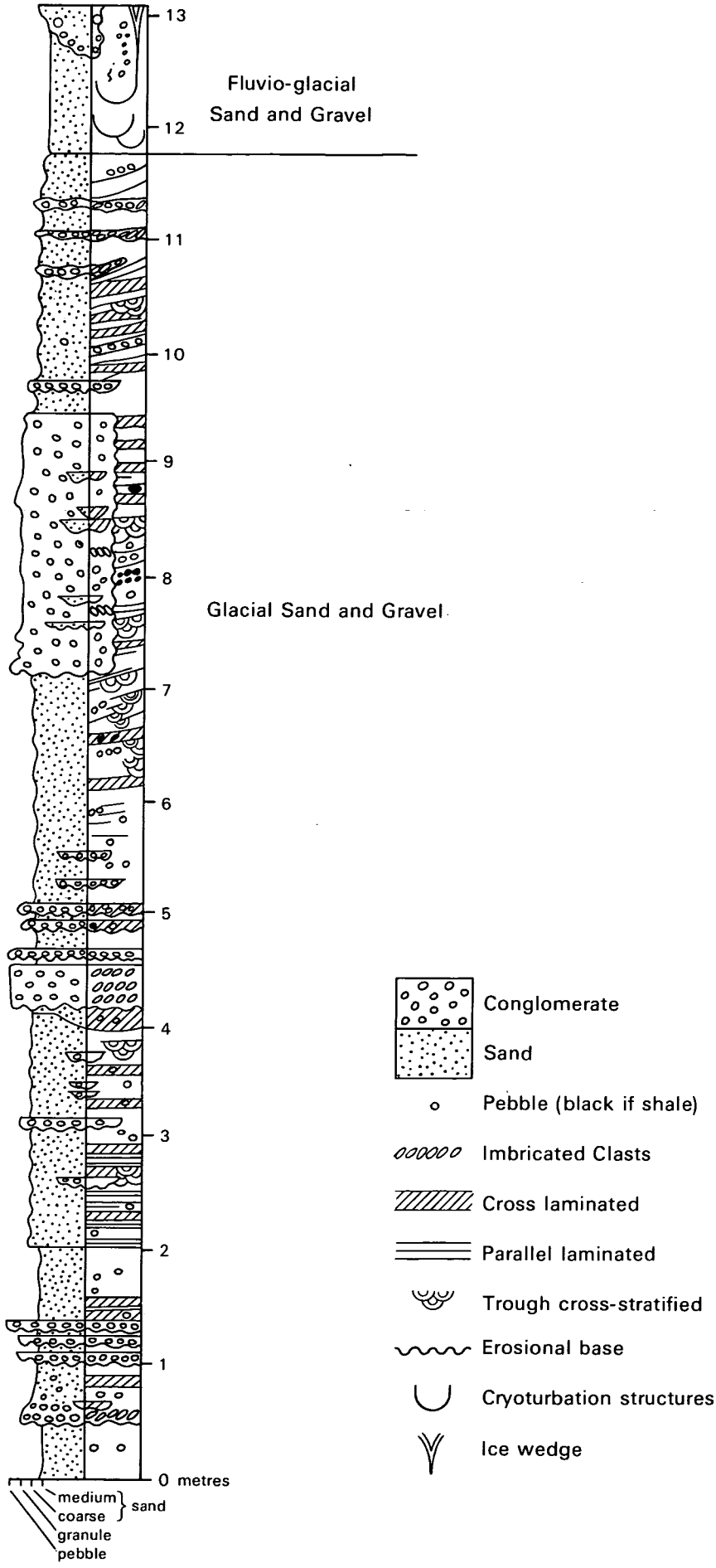

Figure 5. Generalised section of sand and gravel workings, Meriden Quarry [233 818]

[2306 8276], Cunnington (1913) noted 3 m of "streaked whitish and yellowish-red sand with occasional earthy layers. Thin lenticular layers of fine angular pebbles including flints."

North west of Packington Old Hall [228 849], flooded workings are now used as a trout fishery. Some poor exposures of up to 3 m of buff to brown gravelly sand can be seen.

West of the River Blythe, 6 m of red sand, with only a few pebbles, are poorly exposed in slips in the railway cutting 0.4 km south east of Park Farm [2087 8374]. In a gravel pit immediately east of the railway [2090 8364], Eastwood and others (1925, p119) noted 12 ft (3.7 m) of well bedded gravel with occasional flints, the upper 5 ft (1.5 m) disturbed and clayey in the north east part.

In 1963, during construction of the underpass north of Park Farm [2062 8414], R J Wyatt (BGS unpublished field notes) recorded c. 6 m of 'medium grained, clean well-graded bedded sand, predominantly bright orange or orange-brown in colour, showing distinct false bedding; few scattered pebbles occur in uppermost 8 ft (2.4 m) and very impersistent strings of small pebbles in 4 ft (1.2 m) below: a few thin lenticular bands of pebbly gravel occur (generally up to c. 1 ft thick) consisting of abundant well rounded pebbles in sandy matrix'.

West of Little Packington [211 849], a formerly extensive gravel pit is now incorporated into the major Little Packington Landfill Site. In the south east face, adjacent to Packington Lane, many poor exposures of red and brown sand with scattered pebbles were seen in 1980. About 5 m of sand and gravel have been removed and Mercia Mudstone was sporadically exposed in ditches in the pit floor.

Fluvio-Glacial Gravels

Fluvio-Glacial gravels have been recognised only east of the River Blythe, where they overlap the margins of the Glacial Sand and Gravel. They consist of poorly sorted, commonly clayey, sand and gravel, containing bodies of till-like clays. The pebble content of the gravel resembles that of the

glacial gravels, being dominated by Bunter quartzite, but also includes small proportions of (?Welsh) Lower Palaeozoic rocks, which have not been recorded (at least in the same quantity) in the glacial gravel. The clays are dominantly red brown in colour, and contain Bunter quartzite pebbles and fragments of Enville and (?Triassic) sandstones and a little coal. They have not been mapped separately, but have been recorded in boreholes and in a section (see below). The pebble content of the deposits suggest a roughly northerly derivation, as for the Glacial Sand and Gravel.

The Fluvio-Glacial Gravel forms a thin sheet, overlapping the steep margins of the possibly sub-glacial channel (see above). Farther north, the deposits are not so readily separated, and mapping is largely on the basis of a slight topographic feature, which, it is thought, marks the western margin of the Fluvio-Glacial Gravel where it overlies Glacial Sand and Gravel.
Around 1.2 m of Fluvio-Glacial Gravel is exposed at the top of the eastern and northern faces of Cornet's End Gravel Pit [234 811; 236 815; 236 817]. It consists of grey, brown and ochreous clayey sand and sandy clay with Bunter quartzite pebbles. No bedding could be distinguished, but the whole deposit is cryoturbated, with frost-wedge structures extending to 1.3 m down into the underlying Glacial Sand and Gravel (Figure 5).

At Outwoods, 2 m of red-brown clay containing pebbles and large blocks of red Enville sandstone were exposed in a pipeline trench [2383 8484]. Fluvio-Glacial gravels have been penetrated in a number of gravel trial bores (confidential). Three BGS boreholes (Cannell, 1982), proved a large proportion of till in the deposit. The Park Farm Borehole (SP28SW/335) [2328 8016] proved 2.5 m of brown sandy gravel, underlain by 4.9 m of red-brown stony clay, above bedrock. The Hampton Lane Borehole (SP28SW/32) [2346 8216] proved 5 m of red-brown sandy pebbly clay, above glacial sand. The Harding's Wood Borehole (SP28SW/325) [2351 8323] proved red-brown pebbly clay, with a bed of brown sand to 13.6 m, above 2.1 m of brown sand with scattered pebbles, on bedrock: the lower sand may represent Glacial Sand and Gravel.

River Terrace Deposits

River Terrace Deposits, mainly sand and gravel, commonly flank the flood-plain of the Blythe. In addition, a broad bench cut into the Glacial Sand and Gravel may be the result of reworking by the river at an early stage of downcutting. South of the district, the bench is well preserved, and falls gently in height to the north, but within the district the bench is too dissected for any consistent gradient to be discerned. It is clearest on the eastern side of the valley, where the Glacial Sand and Gravel forms a plateau at around +95 to +99 m OD. It is particularly obvious south of The Somers [225 819], where it is about 500 m wide and bounded on the east by a pronounced rise of about 5 m (capped by Fluvio-Glacial Gravel) that trends roughly parallel to, and just east of, Somers Lane. No deposits have been mapped on the bench, although the upper part of the Glacial Sand and Gravel may have been reworked.

Deposits of the Second Terrace have been recognised at three localities near Molands Bridge [217 814; 222 818; 219 821]. They form gently sloping spreads, with a poorly preserved bench about 3 to 5 m above the modern river floodplain. The deposits consist of brown sandy gravel, similar in composition to, and evidently derived from, the older glacial and fluvio-glacial sands and gravels, from which they are distinguishable solely on the basis on their situation and form.

Deposits of the First Terrace are more widespread than those of the Second Terrace, and form well-defined benches bordering the floodplain, generally about 1 to 1.5 m above the alluvium and rising gently to about 2 m further from the river. The deposits consist of loamy sand and gravel, in parts very clayey or silty. Gravel trial bores suggest that the deposits average about 1.5 m in thickness, but locally reach up to 3 m, thus extending below the level of the floodplain.

West of Packhorse Bridge, Hampton in Arden [210 801], dark grey clays have been assigned to the First Terrace. In a ditch running across the terrace, grey and grey brown clay up to 1.3 m thick is exposed above Mercia Mudstone [2080 8006]. Near the bridge, the terrace is about 1 m above the modern floodplain, but it grades imperceptibly downstream to the north into the

modern alluvium, and is clearly slightly younger than the terrace gravels on the opposite side of the stream. To the south, the clayey deposits can be seen to mark an abandoned river coarse, which diverges from the present course of the Blythe at Barston Bridge (Old 1987), at which point [216 784] the clay terrace corresponds in height with the gravel terrace on the present course of the Blythe (ie, about 3 to 4 m above the modern floodplain). These relationships suggest that the Blythe originally flowed along its present course, depositing the terrace gravel. Following diversion, the clay terrace was then deposited, though downcutting did not proceed further upstream than Packhorse Bridge, above which the clay and gravel terraces correspond in height. The river then resumed its original course, downcutting proceeded upstream, and the modern floodplain was formed.

Alluvium

Alluvium forms the floodplain of the River Blythe, and floors the tributary valleys. It consists of grey or brown loamy clay and silt, commonly containing sandy and peaty lenses, generally with a thin basal lag deposit of gravel. Along the Blythe, boreholes indicate that the alluvium may locally exceed 3 m in thickness, although 2 m is probably a more usual average. The alluvium of the streams draining the Glacial Sand and Gravel at Cornet's End [221 802; 227 814] is, in places, conspicuously gravelly. At Mercote Lodge [220 802] the stream deposits appear to grade into the first terrace bench, suggesting that the alluvium here is in part contemporaneous with the First Terrace gravels.

The hill east of Patrick Bridge [218 811] is encircled by alluvium, a broad alluvial flat east of the hill joining the Blythe floodplain alluvium to the north and south [218 817; 216 808]. This alluvial flat may mark a former coarse of the River Blythe, although this seems unlikely, for First Terrace gravels border the modern Blythe floodplain north of the hill [216 816] showing that the Blythe followed its present course prior to formation of the alluvial flat to the east. The flat was more probably formed by capture of the stream north of Hornbrook Farm [223 813], (that originally drained northwards), by the stream to the south [223 809]; all the drainage now flows around the south of the hill, and the northern part of the alluvial flat is virtually dry.

ECONOMIC GEOLOGY

Brickclay

Mercia Mudstone is dug for brickmaking at the Jackson's Brickworks (Arden Brick Co. Ltd.) [205 828]. After crushing and forming the clay, the bricks are fired in gas-fuelled kilns. A variety of different colours of facing bricks are produced by the use of additives. Resources are virtually unlimited, although there are obvious practical limits to the depth and extent of quarrying.

Coal

The western margin of the South Warwickshire Prospect, a major area of unworked Thick Coal is formed by the Meriden Fault. Details of the prospect have been published by British Coal (National Coal Board, 1985; British Coal Corporation, 1987).

Sand and Gravel

Glacial Sand and Gravel was extensively worked by the Amey Roadstone Corporation at Little Packington [210 849], Great Packington [228 849] and The Somers [223 824]. The currently working pits are at Cornets End [235 819; 225 806]. The former operated by Tilcon Ltd. currently produces mainly sand, used largely as building sand, and, with additives, as moulding sand. The latter, operated by Western Aggregates Ltd. produces sand and gravel.

Of the remaining unworked areas of Glacial Sand and Gravel, the most promising in terms of thickness are those north of Middle Bickenhill [202 841] and at Harding's Wood [233 832].

Fluvio-Glacial gravels and river terrace deposits are generally likely to be too clayey, too thin, or too limited in extent to be of commercial interest, although First Terrace gravels were worked on a small scale at Packhorse Bridge [213 802].

A fuller account of the sand and gravel resources of the district is given by Cannell (1982).

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APPENDIX: Schedule of boreholes on Sheet SP28SW

BOREHOLE REF.NO. SP28SW	BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
1	PACKINGTON BH GREAT PACKINGTON	2471	8479	612.34	1898
2	PACKINGTON PARK & PACKINGTON IND EST	----	----	5.79	1961
3	PACKINGTON PARK & PACKINGTON IND EST	2128	8409	5.49	1961
4	PACKINGTON PARK & PACKINGTON IND EST	2128	8417	6.02	1961
5	PACKINGTON PARK & PACKINGTON IND EST	2132	8425	5.49	1961
6	PACKINGTON PARK & PACKINGTON IND EST	2140	8429	4.27	1961
7	PACKINGTON PARK & PACKINGTON IND EST	2147	8434	4.27	1961
8	PACKINGTON PARK & PACKINGTON IND EST	2153	8442	3.66	1961
9	PACKINGTON PARK & PACKINGTON IND EST	2163	8447	4.57	1961
10	PACKINGTON PARK & PACKINGTON IND EST	2170	8453	3.50	1961
11	PACKINGTON PARK & PACKINGTON IND EST	2176	8457	2.74	1961
12	PACKINGTON PARK & PACKINGTON IND EST	2183	8456	4.57	1961
13	PACKINGTON PARK & PACKINGTON IND EST	2178	8450	3.35	1961
14	PACKINGTON PARK & PACKINGTON IND EST	2174	8445	2.90	1961
15	PACKINGTON PARK & PACKINGTON IND EST	2170	8437	2.59	1961
16	PACKINGTON PARK & PACKINGTON IND EST	2162	8431	3.35	1961
17	PACKINGTON PARK & PACKINGTON IND EST	2144	8421	3.12	1961
18	PACKINGTON PARK & PACKINGTON IND EST	2144	8413	2.44	1961
19	PACKINGTON PARK & PACKINGTON IND EST	2120	8410	2.97	1961
20	PACKINGTON PARK & PACKINGTON IND EST	2113	8404	2.44	1961
21	PACKINGTON PARK & PACKINGTON IND EST	2107	8396	3.35	1961
22	PACKINGTON PARK & PACKINGTON IND EST	2118	8399	3.05	1961
23	PACKINGTON PARK & PACKINGTON IND EST	2121	8361	3.66	1961
24	PACKINGTON PARK & PACKINGTON IND EST	2119	8375	4.57	1961
25	PACKINGTON PARK & PACKINGTON IND EST	2125	8400	5.81	1961
26	PACKINGTON PARK & PACKINGTON IND EST	2133	8390	4.19	1961
27	PACKINGTON PARK & PACKINGTON IND EST	2178	8411	4.19	1961
28	PACKINGTON PARK & PACKINGTON IND EST	2178	8411	6.40	1961
29	PACKINGTON PARK & PACKINGTON IND EST	2188	8412	2.89	1961
30	PACKINGTON PARK & PACKINGTON IND EST	2146	8328	2.44	1961
31	PACKINGTON PARK & PACKINGTON IND EST	2159	8344	3.50	1961
32	PACKINGTON PARK & PACKINGTON IND EST	2155	8359	2.74	1961
33	PACKINGTON PARK & PACKINGTON IND EST	2145	8357	3.20	1961
34	PACKINGTON PARK & PACKINGTON IND EST	2140	8336	2.89	1961
35	PACKINGTON PARK & PACKINGTON IND EST	2125	8363	4.88	1961
36	PACKINGTON PARK & PACKINGTON IND EST	2146	8387	3.81	1961
37	PACKINGTON PARK & PACKINGTON IND EST	2151	8375	3.96	1961
38	PACKINGTON PARK & PACKINGTON IND EST	2138	8373	3.96	1961
39	PACKINGTON PARK & PACKINGTON IND EST	2135	8448	6.10	1961
40	PACKINGTON PARK & PACKINGTON IND EST	2132	8439	6.10	1961
41	PACKINGTON PARK & PACKINGTON IND EST	2127	8431	6.10	1961
42	PACKINGTON PARK & PACKINGTON IND EST	2123	8423	3.81	1961
43	PACKINGTON PARK & PACKINGTON IND EST	2140	8439	4.57	1961
44	PACKINGTON PARK & PACKINGTON IND EST	2139	8451	6.40	1961

BOREHOLE REF.NO. SP28SW	BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
45	PACKINGTON PARK & PACKINGTON IND EST	2142	8466	6.10	1961
46	PACKINGTON PARK & PACKINGTON IND EST	2148	8478	5.79	1961
47	PACKINGTON PARK & PACKINGTON IND EST	2150	8466	5.71	1961
48	PACKINGTON PARK & PACKINGTON IND EST	2160	8464	3.05	1961
49	PACKINGTON PARK & PACKINGTON IND EST	2170	8464	3.50	1961
50	PACKINGTON PARK & PACKINGTON IND EST	2156	8455	5.79	1961
51	PACKINGTON PARK & PACKINGTON IND EST	2145	8446	5.03	1961
52	PACKINGTON PARK & PACKINGTON IND EST	2188	8468	3.81	1961
53	PACKINGTON PARK & PACKINGTON IND EST	2188	8484	3.50	1961
54	PACKINGTON PARK & PACKINGTON IND EST	2176	8495	3.81	1961
55	PACKINGTON PARK & PACKINGTON IND EST	2173	8477	3.35	1961
56	PACKINGTON PARK & PACKINGTON IND EST	2189	8428	3.66	1961
57	PACKINGTON PARK & PACKINGTON IND EST	2179	8431	4.57	1961
58	PACKINGTON PARK & PACKINGTON IND EST	2188	8442	3.20	1961
59	PACKINGTON PARK & PACKINGTON IND EST	2194	8445	3.35	1961
60	PACKINGTON PARK & PACKINGTON IND EST	2196	8492	4.27	1961
61	PACKINGTON PARK & PACKINGTON IND EST	2306	8489	6.10	1961
62	PACKINGTON PARK & PACKINGTON IND EST	2316	8487	6.10	1961
63	PACKINGTON PARK & PACKINGTON IND EST	2330	8484	4.42	1961
64	PACKINGTON PARK & PACKINGTON IND EST	2339	8478	4.04	1961
65	PACKINGTON PARK & PACKINGTON IND EST	2325	8486	6.02	1961
66	PACKINGTON PARK & PACKINGTON IND EST	2312	8497	6.25	1961
67	PACKINGTON PARK & PACKINGTON IND EST	2324	8495	6.25	1961
68	PACKINGTON PARK & PACKINGTON IND EST	2333	8495	6.10	1961
69	PACKINGTON PARK & PACKINGTON IND EST	2345	8499	6.40	1961
70	PACKINGTON PARK & PACKINGTON IND EST	2160	8482	6.25	1961
71	PACKINGTON PARK & PACKINGTON IND EST	2163	8471	6.10	1961
72	PACKINGTON PARK & PACKINGTON IND EST	2164	8459	3.05	1961
73	PACKINGTON PARK & PACKINGTON IND EST	2150	8128	3.96	1961
74	PACKINGTON PARK & PACKINGTON IND EST	2152	8117	2.97	1961
75	PACKINGTON PARK & PACKINGTON IND EST	2152	8104	2.97	1961
76	PACKINGTON PARK & PACKINGTON IND EST	2152	8091	3.12	1961
77	PACKINGTON PARK & PACKINGTON IND EST	2124	8442	5.79	1961
78	PACKINGTON PARK & PACKINGTON IND EST	2118	8452	5.49	1961
79	PACKINGTON PARK & PACKINGTON IND EST	2136	8466	4.88	1961
80	PACKINGTON PARK & PACKINGTON IND EST	2134	8453	6.10	1961
81	PACKINGTON PARK & PACKINGTON IND EST	2122	8458	5.49	1961
82	PACKINGTON PARK & PACKINGTON IND EST	2128	8467	3.66	1961
83	PACKINGTON PARK & PACKINGTON IND EST	2140	8481	5.79	1961
84	PACKINGTON PARK & PACKINGTON IND EST	2136	8473	6.10	1961
85	PACKINGTON PARK & PACKINGTON IND EST	2099	8372	5.79	1961
86	PACKINGTON PARK & PACKINGTON IND EST	2098	8385	6.10	1961
87	PACKINGTON PARK & PACKINGTON IND EST	2109	8382	6.10	1961
88	PACKINGTON PARK & PACKINGTON IND EST	2116	8352	5.49	1961
89	PACKINGTON PARK & PACKINGTON IND EST	2121	8344	6.10	1961
90	PACKINGTON PARK & PACKINGTON IND EST	2128	8350	5.49	1961
91	PACKINGTON PARK & PACKINGTON IND EST	2215	8269	3.35	1961
92	PACKINGTON PARK & PACKINGTON IND EST	2203	8260	5.03	1961
93	PACKINGTON PARK & PACKINGTON IND EST	2198	8270	5.18	1961
94	PACKINGTON PARK & PACKINGTON IND EST	2194	8281	4.11	1961
95	PACKINGTON PARK & PACKINGTON IND EST	2187	8286	2.74	1961

BOREHOLE REF.NO. SP28SW	BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
96	PACKINGTON PARK & PACKINGTON IND EST	2184	8277	3.50	1961
97	PACKINGTON PARK & PACKINGTON IND EST	2175	8282	4.27	1961
98	PACKINGTON PARK & PACKINGTON IND EST	2170	8268	4.27	1961
99	PACKINGTON PARK & PACKINGTON IND EST	2172	8256	4.42	1961
100	PACKINGTON PARK & PACKINGTON IND EST	2185	8265	6.10	1961
101	PACKINGTON PARK & PACKINGTON IND EST	2187	8245	4.57	1961
102	PACKINGTON PARK & PACKINGTON IND EST	2191	8238	4.42	1961
103	PACKINGTON PARK & PACKINGTON IND EST	2205	8236	3.66	1961
104	PACKINGTON PARK & PACKINGTON IND EST	2204	8246	5.79	1961
105	PACKINGTON PARK & PACKINGTON IND EST	2228	8262	5.79	1961
106	PACKINGTON PARK & PACKINGTON IND EST	2229	8250	4.57	1961
107	PACKINGTON PARK & PACKINGTON IND EST	2230	8240	4.57	1961
108	PACKINGTON PARK & PACKINGTON IND EST	2230	8230	5.79	1961
109	PACKINGTON PARK & PACKINGTON IND EST	2232	8222	5.64	1961
110	PACKINGTON PARK & PACKINGTON IND EST	2234	8213	3.66	1961
111	PACKINGTON PARK & PACKINGTON IND EST	2247	8218	4.27	1961
112	PACKINGTON PARK & PACKINGTON IND EST	2247	8228	5.79	1961
113	PACKINGTON PARK & PACKINGTON IND EST	2248	8239	5.49	1961
114	PACKINGTON PARK & PACKINGTON IND EST	2250	8250	5.18	1961
115	PACKINGTON PARK & PACKINGTON IND EST	2249	8262	4.88	1961
116	PACKINGTON PARK & PACKINGTON IND EST	2266	8257	4.57	1961
117	PACKINGTON PARK & PACKINGTON IND EST	2220	8222	4.11	1961
118	PACKINGTON PARK & PACKINGTON IND EST	2217	8248	5.49	1961
119	PACKINGTON PARK & PACKINGTON IND EST	2188	8256	4.57	1961
120	PACKINGTON PARK & PACKINGTON IND EST	2358	8219	2.13	1961
121	PACKINGTON PARK & PACKINGTON IND EST	2346	8225	6.10	1961
122	PACKINGTON PARK & PACKINGTON IND EST	2319	8219	6.10	1961
123	PACKINGTON PARK & PACKINGTON IND EST	2330	8210	5.49	1961
124	PACKINGTON PARK & PACKINGTON IND EST	2333	8234	6.10	1961
125	PACKINGTON PARK & PACKINGTON IND EST	2311	8239	5.79	1961
126	PACKINGTON PARK & PACKINGTON IND EST	2327	8259	6.10	1961
127	PACKINGTON PARK & PACKINGTON IND EST	2265	8260	3.05	1961
128	PACKINGTON PARK & PACKINGTON IND EST	2284	8235	3.66	1961
129	PACKINGTON PARK & PACKINGTON IND EST	2288	8252	3.66	1961
130	PACKINGTON PARK & PACKINGTON IND EST	2268	8291	3.35	1961
131	PACKINGTON PARK & PACKINGTON IND EST	2258	8282	4.42	1961
132	PACKINGTON PARK & PACKINGTON IND EST	2250	8273	3.35	1961
133	PACKINGTON PARK & PACKINGTON IND EST	2240	8278	3.35	1961
134	PACKINGTON PARK & PACKINGTON IND EST	2225	8287	5.18	1961
135	PACKINGTON PARK & PACKINGTON IND EST	2240	8252	5.49	1961
136	PACKINGTON PARK & PACKINGTON IND EST	2278	8275	4.42	1961
137	PACKINGTON PARK & PACKINGTON IND EST	2282	8212	5.79	1961
138	PACKINGTON PARK & PACKINGTON IND EST	2299	8208	6.10	1961
139	PACKINGTON PARK & PACKINGTON IND EST	2299	8239	3.50	1961
140	PACKINGTON PARK & PACKINGTON IND EST	2239	8179	4.27	1961
141	PACKINGTON PARK & PACKINGTON IND EST	2254	8183	3.50	1961
142	PACKINGTON PARK & PACKINGTON IND EST	2258	8162	3.96	1961
143	PACKINGTON PARK & PACKINGTON IND EST	2249	8156	3.50	1961
144	PACKINGTON PARK & PACKINGTON IND EST	2253	8144	4.57	1961
145	PACKINGTON PARK & PACKINGTON IND EST	2232	8163	4.27	1961
146	PACKINGTON PARK & PACKINGTON IND EST	2235	8150	4.42	1961

BOREHOLE REF.NO. SP28SW		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
147		PACKINGTON PARK & PACKINGTON IND EST	2209	8175	4.11	1961
148		PACKINGTON PARK & PACKINGTON IND EST	2223	8178	3.96	1961
149		PACKINGTON PARK & PACKINGTON IND EST	2214	8193	4.11	1961
150		PACKINGTON PARK & PACKINGTON IND EST	2227	8197	3.96	1961
151		PACKINGTON PARK & PACKINGTON IND EST	2215	8211	3.05	1961
152		PACKINGTON PARK & PACKINGTON IND EST	2228	8211	2.74	1961
153		PACKINGTON PARK & PACKINGTON IND EST	2239	8195	3.66	1961
154		PACKINGTON PARK & PACKINGTON IND EST	2250	8209	3.50	1961
155		PACKINGTON PARK & PACKINGTON IND EST	2254	8199	4.57	1961
156		PACKINGTON PARK & PACKINGTON IND EST	2264	8190	3.66	1961
157		PACKINGTON PARK & PACKINGTON IND EST	2274	8196	3.66	1961
158		PACKINGTON PARK & PACKINGTON IND EST	2219	8237	4.88	1961
159		PACKINGTON PARK & PACKINGTON IND EST	2224	8138	3.81	1961
160		PACKINGTON PARK & PACKINGTON IND EST	2213	8139	3.96	1961
161		PACKINGTON PARK & PACKINGTON IND EST	2201	8145	3.81	1961
162		PACKINGTON PARK & PACKINGTON IND EST	2208	8160	4.27	1961
163		PACKINGTON PARK & PACKINGTON IND EST	2220	8153	3.96	1961
164		PACKINGTON PARK & PACKINGTON IND EST	2194	8135	2.44	1961
165		PACKINGTON PARK & PACKINGTON IND EST	2185	8128	1.83	1961
166		PACKINGTON PARK & PACKINGTON IND EST	2160	8147	3.05	1961
167		PACKINGTON PARK & PACKINGTON IND EST	2152	8159	2.44	1961
168		PACKINGTON PARK & PACKINGTON IND EST	2187	8175	2.13	1961
169		PACKINGTON PARK & PACKINGTON IND EST	2185	8314	4.57	1961
170		PACKINGTON PARK & PACKINGTON IND EST	2186,	8298	3.96	1961
171		PACKINGTON PARK & PACKINGTON IND EST	2290	8470	1.07	1961
172		PACKINGTON PARK & PACKINGTON IND EST	2304	8471	1.52	1961
173		PACKINGTON PARK & PACKINGTON IND EST	2315	8473	6.10	1961
174		PACKINGTON PARK & PACKINGTON IND EST	2330	8471	3.96	1961
175		PACKINGTON PARK & PACKINGTON IND EST	2293	8471	7.31	1961
176		PACKINGTON PARK & PACKINGTON IND EST	2278	8471	5.33	1961
177		PACKINGTON PARK & PACKINGTON IND EST	2266	8472	3.96	1961
178		PACKINGTON PARK & PACKINGTON IND EST	2305	8472	5.79	1961
179	c	BERRYFIELDS FARM BH WARKS	24985	81476	1012.80	1977
180		NORTH LODGE PACKINGTON PARK WARKS	2203	8475	6.10	1943
181		NORTH WARWICKSHIRE WATER CO WARKS	218	822	164.90	1903
182		MERIDEN SEWERAGE SCHEME BH1 MERIDEN	2488	8180	3.00	1977
183		MERIDEN SEWERAGE SCHEME BH17 MERIDEN	2497	8190	3.00	1977
184		MERIDEN SEWERAGE SCHEME BH18 MERIDEN	2480	8194	3.00	1977
185		MERIDEN SEWERAGE SCHEME BH20 MERIDEN	2465	8185	3.00	1977
186		MERIDEN SEWERAGE SCHEME BH21 MERIDEN	2444	8198	3.00	1977
187		MERIDEN SEWERAGE SCHEME BH22 MERIDEN	2423	8202	5.00	1977
188		MERIDEN SEWERAGE SCHEME BH22 MERIDEN	2403	8190	3.00	1977
189	c	CORNETS END FARM MERIDEN BH8	2354	8118	----	----
190	c	CORNETS END FARM MERIDEN BH10	2345	8105	----	----
191	c	CORNETS END FARM MERIDEN BH27	2375	8130	----	----
192	c	CORNETS END FARM MERIDEN BH32	2388	8150	----	----
193	c	CORNETS END FARM MERIDEN BH36	2367	8125	----	----
194	c	CORNETS END FARM MERIDEN BH38	2378	8167	----	----
195	c	CORNETS END FARM MERIDEN BH44	2362	8153	----	----
196	c	CORNETS END GRAVEL PIT MERIDEN BH74/1	2339	8185	----	1974
197	c	CORNETS END GRAVEL PIT MERIDEN BH74/2	2356	8178	----	1974

BOREHOLE REF.NO. SP28SW		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
198	c	CORNETS END GRAVEL PIT MERIDEN BH74/3	2364	8188	----	1974
199	c	CORNETS END GRAVEL PIT MERIDEN BH74/4	2345	8212	----	1974
200	c	CORNETS END GRAVEL PIT MERIDEN BH74/5	2371	8207	----	1974
201	c	CORNETS END GRAVEL PIT MERIDEN BH74/11	2305	8187	----	1976
202	c	CORNETS END GRAVEL PIT MERIDEN BH74/12	2303	8170	----	1976
203	c	CORNETS END GRAVEL PIT MERIDEN BH74/13	2270	8159	----	1976
204	c	CORNETS END GRAVEL PIT MERIDEN BH74/14	2277	8179	----	1976
205	c	MERIDEN SAND PROJECT MERIDEN BH1	2312	8242	----	1980
206	c	MERIDEN SAND PROJECT MERIDEN BH2	2335	8252	----	1980
207	c	MERIDEN SAND PROJECT MERIDEN BH3	2325	8218	----	1980
208	c	MERIDEN SAND PROJECT MERIDEN BH4	2296	8203	----	1980
209	c	MERIDEN SAND PROJECT MERIDEN BH5	2296	8230	----	1980
210	c	MERIDEN SAND PROJECT MERIDEN BH6	2345	8230	----	1980
211	c	MERCOTE MILL FARM BERKSWELL BH1	2322	8075	----	----
212	c	MERCOTE MILL FARM BERKSWELL BH2	2302	8074	----	----
213	c	MERCOTE MILL FARM BERKSWELL BH3	2320	8057	----	----
214	c	MERCOTE MILL FARM BERKSWELL BH4	2307	8056	----	----
215	c	MERCOTE MILL FARM BERKSWELL BH5	2288	8047	----	----
216	c	MERCOTE MILL FARM BERKSWELL BH6	2281	8037	----	----
217	c	MERCOTE MILL FARM BERKSWELL BH7	2267	8036	----	----
218	c	MERCOTE MILL FARM BERKSWELL BH8	2267	8046	----	----
219	c	MERCOTE MILL FARM BERKSWELL BH9	2254	8038	----	----
220	c	MERCOTE MILL FARM BERKSWELL BH10	2233	8036	----	----
221	c	MERCOTE MILL FARM BERKSWELL BH11	2219	8043	----	----
222	c	MERCOTE MILL FARM BERKSWELL BH12	2247	8044	----	----
223	c	MERCOTE MILL FARM BERKSWELL BH13	2248	8059	----	----
224	c	MERCOTE MILL FARM BERKSWELL BH14	2242	8079	----	----
225	c	MERCOTE MILL FARM BERKSWELL BH15	2258	8073	----	----
226	c	MERCOTE MILL FARM BERKSWELL BH16	2259	8087	----	----
227	c	MERCOTE MILL FARM BERKSWELL BH17	2271	8088	----	----
228	c	MERCOTE MILL FARM BERKSWELL BH18	2276	8078	----	----
229	c	MERCOTE MILL FARM BERKSWELL BH19	2238	8113	----	----
230	c	MERCOTE MILL FARM BERKSWELL BH20	2237	8098	----	----
231	c	MERCOTE MILL FARM BERKSWELL BH21	2227	8092	----	----
232	c	MERCOTE MILL FARM BERKSWELL BH22	2236	8082	----	----
233	c	MERCOTE MILL FARM BERKSWELL BH23	2223	8083	----	----
234	c	MERCOTE MILL FARM BERKSWELL BH24	2229	8072	----	----
235	c	MERCOTE MILL FARM BERKSWELL BH25	2233	8060	----	----
236	c	MERCOTE MILL FARM BERKSWELL BH26	2274	8063	----	----
237	c	MERCOTE MILL FARM BERKSWELL BH27	2276	8057	----	----
238	c	MERCOTE MILL FARM BERKSWELL BH28	2261	8092	----	----
239	c	MERCOTE MILL FARM BERKSWELL BH29	2260	8098	----	----
240	c	MERCOTE MILL FARM BERKSWELL BH30	2252	8090	----	----
241	c	MERCOTE MILL FARM BERKSWELL BH31	2247	8087	----	----
242	c	THE SOMERS NORTHERN BH1	2263	8239	----	1970
243	c	THE SOMERS NORTHERN BH2	2264	8244	----	1970
244	c	THE SOMERS NORTHERN BH3	2263	8248	----	1970
245	c	THE SOMERS NORTHERN BH4	2264	8254	----	1970
246	c	THE SOMERS NORTHERN BH5	2265	8258	----	1970
247	c	THE SOMERS NORTHERN BH6	2260	8260	----	1970
248	c	THE SOMERS NORTHERN BH7	2260	8255	----	1970

BOREHOLE REF.NO. SP28SW		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
249	c	THE SOMERS NORTHERN BH8	2260	8251	----	1970
250	c	THE SOMERS NORTHERN BH9	2260	8246	----	1970
251	c	THE SOMERS NORTHERN BH10	2259	8242	----	1970
252	c	THE SOMERS NORTHERN BH11	2255	8240	----	1970
253	c	THE SOMERS NORTHERN BH12	2254	8245	----	1970
254	c	THE SOMERS NORTHERN BH13	2255	8240	----	1970
255	c	THE SOMERS NORTHERN BH14	2256	8253	----	1970
256	c	THE SOMERS NORTHERN BH15	2256	8258	----	1970
257	c	THE SOMERS NORTHERN BH16	2250	8262	----	1970
258	c	THE SOMERS NORTHERN BH17	2250	8258	----	1970
259	c	THE SOMERS NORTHERN BH18	2251	8253	----	1970
260	c	THE SOMERS NORTHERN BH19	2260	8262	----	1970
261	c	THE SOMERS NORTHERN BH20	2261	8265	----	1970
262	c	THE SOMERS NORTHERN BH21	2262	8269	----	1970
263	c	THE SOMERS NORTHERN BH22	2264	8274	----	1970
264	c	THE SOMERS NORTHERN BH23	2265	8279	----	1970
265	c	THE SOMERS NORTHERN BH24	2261	8280	----	1970
266	c	THE SOMERS NORTHERN BH25	2259	8276	----	1970
267	c	THE SOMERS NORTHERN BH26	2258	8271	----	1970
268	c	THE SOMERS NORTHERN BH27	2256	8267	----	1970
269	c	THE SOMERS NORTHERN BH28	2255	8267	----	1970
270	c	THE SOMERS NORTHERN BH29	2250	8264	----	1970
271	c	THE SOMERS NORTHERN BH30	2251	8267	----	1970
272	c	THE SOMERS NORTHERN BH31	2252	8272	----	1970
273	c	THE SOMERS NORTHERN BH32	2254	8276	----	1970
274	c	THE SOMERS NORTHERN BH33	2256	8280	----	1970
275	c	THE SOMERS NORTHERN BH34	2254	8279	----	1970
276	c	THE SOMERS NORTHERN BH35	2246	8283	----	1970
277	c	THE SOMERS NORTHERN BH36	2239	8287	----	1970
278	c	THE SOMERS NORTHERN BH37	2231	8291	----	1970
279	c	THE SOMERS NORTHERN BH38	2225	8290	----	1970
280	c	THE SOMERS NORTHERN BH39	2224	8285	----	1970
281	c	THE SOMERS NORTHERN BH40	2230	8283	----	1970
282	c	THE SOMERS NORTHERN BH41	2238	8278	----	1970
283	c	THE SOMERS NORTHERN BH42	2245	8274	----	1970
284	c	THE SOMERS NORTHERN BH43	2289	8256	----	1970
285	c	THE SOMERS NORTHERN BH44	2280	8258	----	1970
286	c	THE SOMERS NORTHERN BH45	2271	8259	----	1970
287	c	THE SOMERS NORTHERN BH46	2264	8263	----	1970
288	c	THE SOMERS NORTHERN BH47	2266	8269	----	1970
289	c	THE SOMERS NORTHERN BH48	2275	8267	----	1970
290	c	THE SOMERS NORTHERN BH49	2284	8266	----	1970
291	c	THE SOMERS NORTHERN BH50	2287	8274	----	1970
292	c	THE SOMERS NORTHERN BH51	2279	8276	----	1970
293	c	THE SOMERS NORTHERN BH52	2270	8278	----	1970
294	c	THE SOMERS SOUTHERN BH1	2252	8187	----	1970
295	c	THE SOMERS SOUTHERN BH2	2260	8190	----	1970
296	c	THE SOMERS SOUTHERN BH3	2268	8192	----	1970
297	c	THE SOMERS SOUTHERN BH4	2275	8199	----	1970
298	c	THE SOMERS SOUTHERN BH5	2266	8202	----	1970
299	c	THE SOMERS SOUTHERN BH6	2263	8197	----	1970

BOREHOLE REF.NO. SP28SW		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
300	c	THE SOMERS SOUTHERN BH7	2256	8205	----	1970
301	c	THE SOMERS SOUTHERN BH8	2254	8197	----	1970
302	c	THE SOMERS SOUTHERN BH9	2246	8185	----	1970
303	c	THE SOMERS SOUTHERN BH10	2247	8194	----	1970
304	c	THE SOMERS SOUTHERN BH11	2248	8202	----	1970
305	c	THE SOMERS SOUTHERN BH12	2248	8211	----	1970
306	c	THE SOMERS SOUTHERN BH13	2239	8184	----	1970
307	c	THE SOMERS SOUTHERN BH14	2238	8191	----	1970
308	c	THE SOMERS SOUTHERN BH15	2238	8200	----	1970
309	c	THE SOMERS SOUTHERN BH16	2240	8209	----	1970
310	c	THE SOMERS SOUTHERN BH17	2233	8212	----	1970
311	c	THE SOMERS SOUTHERN BH18	2229	8203	----	1970
312	c	THE SOMERS SOUTHERN BH19	2230	8194	----	1970
313	c	THE SOMERS SOUTHERN BH20	2231	8185	----	1970
314	c	THE SOMERS SOUTHERN BH21	2235	8182	----	1970
315	c	THE SOMERS SOUTHERN BH22	2234	8190	----	1970
316	c	THE SOMERS SOUTHERN BH23	2235	8199	----	1970
317	c	THE SOMERS SOUTHERN BH24	2235	8207	----	1970
318	c	THE SOMERS SOUTHERN BH25	2224	8210	----	1970
319	c	THE SOMERS SOUTHERN BH26	2237	8218	----	1970
320		IMAU MIDDLE BICKENHILL LANE	2027	8395	6.00	1981
321		IMAU SIDING WOOD	2086	8378	11.50	1981
322		IMAU COTTAGE FARM	2024	8306	2.00	1980
323		IMAU STONEBRIDGE	2148	8338	2.00	1981
324		IMAU SOUTHLODGE	2234	8304	6.00	1981
325		IMAU HARDINGS WOOD	2351	8323	16.00	1981
326		IMAU OLD STATION ROAD	2032	8187	3.00	1981
327		IMAU PASTURE FARM	2081	8280	5.00	1981
328		IMAU THE SOMERS	2284	8236	11.50	1981
329		IMAU HAMPTON LANE	2346	8216	23.00	1981
330		IMAU PATRICK FARM	2168	8146	5.00	1981
331		IMAU MERIDEN GOLF COURSE	2262	8178	14.50	1980
332		IMAU MERIDEN HALL	2425	8136	3.00	1981
333		IMAU KENILWORTH ROAD	2167	8083	6.00	1981
334		IMAU CORNETS END	2298	8107	14.00	1980
335		IMAU PARK FARM	2328	8016	8.00	1981
336		IMAU MILL FARM	2245	8022	10.00	1981
337		N.E.C A45 ACCESS C1	2051	8308	20.30	1972
338		N.E.C A45 ACCESS C2A	2050	8309	14.00	1972
339		N.E.C A45 ACCESS C3	2035	8303	8.00	1972
340		N.E.C A45 ACCESS C4	2044	8296	8.00	1972
341		N.E.C A45 ACCESS C5	2060	8317	4.50	1972
342		N.E.C A45 ACCESS C6	2050	8321	4.30	1972
343		N.E.C A45 ACCESS C7	2035	8321	12.00	1972
344		N.E.C A45 ACCESS C8	2028	8321	20.00	1972
345		N.E.C A45 ACCESS C9	2027	8319	20.00	1972
346		N.E.C A45 ACCESS C10	2025	8321	14.60	1972
347		N.E.C A45 ACCESS C10A	2024	8320	15.00	1972
348		N.E.C A45 ACCESS C11	2006	8326	6.00	1972
349		SAND QUARRY 1	2318	8134	15.00	1978
350		SAND QUARRY 2	2292	8127	12.00	1978

BOREHOLE REF.NO. SP28SW		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
351		SAND QUARRY 3	2295	8107	13.00	1978
352		SAND QUARRY 4	2328	8106	15.70	1978
353		SAND QUARRY 5	2327	8115	13.50	1978
354		SAND QUARRY 6	2331	8136	10.00	1978
355		SAND QUARRY 7	2358	8144	12.50	1978
356		SAND QUARRY 8	2349	8128	10.00	1978
357		SAND QUARRY 9	2336	8100	2.00	1978
358	c	CORNETS END LANE BERKSWELL 32	2249	8110	----	1982
359	c	CORNETS END LANE BERKSWELL 33	2242	8098	----	1982
360	c	CORNETS END LANE BERKSWELL 34	2255	8096	----	1982
361	c	CORNETS END LANE BERKSWELL 35	2268	8101	----	1982
362	c	CORNETS END LANE BERKSWELL 36	2282	8098	----	1982
363	c	CORNETS END LANE BERKSWELL 37	2287	8088	----	1982
364	c	ARDEN BRICK WORKS STONEBRIDGE 1	20453	82853	----	----
365	c	ARDEN BRICK WORKS STONEBRIDGE 2	20664	82901	----	----
366	c	ARDEN BRICK WORKS STONEBRIDGE 3	20562	82754	----	----
367	c	PACKINGTON ESTATE PE1	20972	84907	----	1978
368	c	PACKINGTON ESTATE PE2	21177	84844	----	1978
369	c	PACKINGTON ESTATE PE3	20877	84375	----	1979
370	c	PACKINGTON ESTATE PE4	20804	84506	----	1979
371	c	PACKINGTON ESTATE PE6	21253	84344	----	1979
372	c	PACKINGTON ESTATE PE9	20414	84986	----	1983
373	c	PACKINGTON ESTATE PE10	20692	84918	----	1983
374	c	PACKINGTON ESTATE PE11	21052	84594	----	1983
375	c	PACKINGTON ESTATE PE14	21664	84794	----	1983
376	c	PACKINGTON ESTATE PE15	21827	84706	----	1983
377	c	PACKINGTON ESTATE PE16	21502	84424	----	1983
378	c	PACKINGTON ESTATE PE17	21469	84402	----	1983
379	c	PACKINGTON ESTATE PE18	21122	84874	----	1983
380	c	PACKINGTON ESTATE PE19	21140	84863	----	1983
381	c	PACKINGTON ESTATE PE22	20678	84710	----	1983
382	c	PACKINGTON ESTATE PE28	20336	84923	----	1983
383	c	PACKINGTON ESTATE PM15	21177	84822	----	1976
384	c	PACKINGTON ESTATE PM16	21046	84601	----	1976
385	c	PACKINGTON ESTATE PM17	20962	84692	----	1976
386	c	PACKINGTON ESTATE PM24	20282	84960	----	1983
387	c	PACKINGTON ESTATE PM25	20970	84670	----	1983
388	c	PACKINGTON ESTATE PM32	21418	84848	----	1983
389	c	PACKINGTON ESTATE PM33	21359	84492	----	1983
390	c	PACKINGTON ESTATE PM34	20347	84668	----	1983
391	c	PACKINGTON ESTATE PM45	21212	84571	----	1985
392	c	PACKINGTON ESTATE SW OF TRIAL DIG	2110	8484	----	1983
393	c	PACKINGTON ESTATE SE CORNER OF RECTORY	2115	8484	----	1983
394	c	PACKINGTON ESTATE SE OF "THE COFFINS"	2105	8464	----	1983
395	c	PACKINGTON ESTATE DENBIGH VALLEY GB1	2031	8485	----	1960
396	c	PACKINGTON ESTATE DENBIGH VALLEY GB2	2048	8495	----	1960
397	c	PACKINGTON ESTATE DENBIGH VALLEY GB5	2036	8470	----	1960
398	c	PACKINGTON ESTATE DENBIGH VALLEY GB6	2056	8480	----	1960
399	c	PACKINGTON ESTATE DENBIGH VALLEY GB7	2079	8490	----	1960
400	c	PACKINGTON ESTATE DENBIGH VALLEY GB8	2071	8464	----	1960
401	c	PACKINGTON ESTATE DENBIGH VALLEY GB11	2091	8472	----	1960

BOREHOLE REF.NO. SP28SW		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
402	c	PACKINGTON ESTATE DENBIGH VALLEY GB16	2065	8476	----	1960
403	c	PACKINGTON ESTATE DENBIGH VALLEY A9	2097	8476	----	1960
404	c	PACKINGTON ESTATE DENBIGH VALLEY GB9	2047	8451	----	1960
405	c	PACKINGTON ESTATE RECTORY AREA MA1	2128	8432	----	1960
406	c	PACKINGTON ESTATE RECTORY AREA MA2	2132	8441	----	1960
407	c	PACKINGTON ESTATE RECTORY AREA MA3	2136	8448	----	1960
408	c	PACKINGTON ESTATE RECTORY AREA MA4	2144	8444	----	1960
409	c	PACKINGTON ESTATE RECTORY AREA MA5	2147	8442	----	1960
410	c	PACKINGTON ESTATE RECTORY AREA MA6	2140	8437	----	1960
411	c	PACKINGTON ESTATE RECTORY AREA MA7	2138	8453	----	1960
412	c	PACKINGTON ESTATE RECTORY AREA MA8	2141	8460	----	1960
413	c	PACKINGTON ESTATE RECTORY AREA MA10	2151	8484	----	1960
414	c	PACKINGTON ESTATE RECTORY AREA MA11	2161	8480	----	1960
415	c	PACKINGTON ESTATE RECTORY AREA MA12	2156	8464	----	1960
416	c	PACKINGTON ESTATE RECTORY AREA MA13	2149	8448	----	1960
417	c	PACKINGTON ESTATE RECTORY AREA MA14	2126	8437	----	1960
418	c	PACKINGTON ESTATE RECTORY AREA MA16	2139	8483	----	1960
419	c	PACKINGTON ESTATE RECTORY AREA MA17	2140	8483	----	1960
420	c	PACKINGTON ESTATE RECTORY AREA MA19	2144	8468	----	1960
421	c	PACKINGTON ESTATE RECTORY AREA MA101	2125	8442	----	1960
422	c	PACKINGTON ESTATE RECTORY AREA MA102	2118	8450	----	1960
423	c	PACKINGTON ESTATE RECTORY AREA MA103	2135	8463	----	1960
424	c	PACKINGTON ESTATE RECTORY AREA MA105	2122	8459	----	1960
425	c	PACKINGTON ESTATE RECTORY AREA MA106	2128	8468	----	1960
426	c	PACKINGTON ESTATE RECTORY AREA MA108	2138	8473	----	1960
427	c	PACKINGTON ESTATE RECTORY AREA A12	2106	8470	----	1960
428	c	PACKINGTON ESTATE RECTORY AREA A13	2110	8460	----	1960
429	c	PACKINGTON ESTATE RECTORY AREA A14	2104	8463	----	1960
430	c	PACKINGTON ESTATE RECTORY AREA A15	2100	8473	----	1960
431	c	PACKINGTON ESTATE RECTORY AREA A18	2114	8472	----	1960
432	c	PACKINGTON ESTATE RECTORY AREA A20	2122	8476	----	1960
433	c	PACKINGTON ESTATE RECTORY AREA A21	2118	8464	----	1960
434	c	PACKINGTON ESTATE WATER SPORT AREA A3	2113	8497	----	1960
435	c	PACKINGTON ESTATE WATER SPORT AREA A4	2121	8492	----	1960
436	c	PACKINGTON ESTATE WATER SPORT AREA A5	2127	8493	----	1960
437	c	PACKINGTON ESTATE WATER SPORT AREA GB12	2104	8489	----	1960
438	c	PACKINGTON ESTATE WATER SPORT AREA A7	2131	8486	----	1960
439	c	PACKINGTON ESTATE WATER SPORT AREA A8	2135	8495	----	1960
440	c	PACKINGTON ESTATE WATER SPORT AREA A10	2102	8480	----	1960
441	c	PACKINGTON ESTATE WATER SPORT AREA A17	2111	8479	----	1960
442	c	PACKINGTON ESTATE WATER SPORT AREA A19	2122	8482	----	1960
443	c	PACKINGTON ESTATE WATER SPORT AREA A44	2114	8494	----	1960
444	c	PACKINGTON ESTATE WATER SPORT AREA A45	2117	8486	----	1960
445	c	PACKINGTON ESTATE WATER SPORT AREA A46	2125	8488	----	1960
446	c	PACKINGTON ESTATE WATER SPORT AREA A47	2133	8493	----	1960
447	c	PACKINGTON ESTATE WATER SPORT AREA A49	2121	8495	----	1960
448	c	PACKINGTON ESTATE WATER SPORT AREA TP1	20938	84885	----	1979
449	c	PACKINGTON ESTATE WATER SPORT AREA TP5	21135	84998	----	1979
450	c	PACKINGTON ESTATE THE RECTORY TP1	21321	84786	----	1987
451	c	PACKINGTON ESTATE THE RECTORY TP2	21269	84688	----	1987
452	c	PACKINGTON ESTATE THE RECTORY TP3	21200	84591	----	1987

BOREHOLE REF.NO. SP28SW		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
453	c	PACKINGTON ESTATE THE RECTORY TP4	21210	84694	----	1987
454	c	PACKINGTON ESTATE THE RECTORY TP5	21252	84796	----	1987
455	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP11	21302	84976	----	1984
456	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP12	21320	84974	----	1984
457	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP13	21312	84990	----	1984
458	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP14	21312	84964	----	1984
459	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP15	21302	84952	----	1984
460	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP16	21320	84951	----	1984
461	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP17	21312	84941	----	1984
462	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP18	21322	84912	----	1984
463	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP19	21330	84938	----	1984
464	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP20	21334	84960	----	1984
465	c	PACKINGTON ESTATE SOUTH DUCK PONDS TP21	21330	84984	----	1984

Detailed logs of non-confidential boreholes may be examined at the BGS National Geosciences Data Centre, Keyworth, by prior appointment, and on payment of the current fee.

c Denotes confidential records, details of which may only be released by permission of the original source.

British Geological Survey

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With compliments

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Appendix modified
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