Natural Environment Research Council

BRITISH GEOLOGICAL SURVEY

TECHNICAL REPORT WA/88/50

Sheet SP 37 SE

Bubbenhall

Part of 1:50 000 sheet 184 (Warwick)

M G SUMBLER

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CONTENTS

SUMMARY

The geology of Sheet SP 37 SE (Bubbenhall) is described with emphasis on significant exposed sections and borehole logs.

The Cambrian and older Carboniferous formations are not represented at outcrop, and are known only from a number of boreholes which are summarised in graphic form. The younger Carboniferous and Triassic formations which come to crop are either very poorly exposed or concealed beneath widespread drift deposits.

Details are given of the lithologies and thicknesses of the drift deposits, which include important sections in sand and gravel. Diagrams show the thickness of the drift and the elevation of the sub-drift topography.

Attention is drawn to the coal reserves underlying the area and to other mineral resources including sand and gravel. A schedule of boreholes is appended.

INTRODUCTION

This account describes the geology of 1:10,000 sheet SP 37 SE (Bubbenhall) (Figure 1). The area was first geologically surveyed on the one-inch scale by H.H.Howell, and was included in Old Series One-Inch Sheet 53NW, published in 1855. A brief account of the geology, although with few specific references to the area, was given by Howell (1859). The area was surveyed on the 1:10,000 scale by M.G. Sumbler in 1977 and 1978, and minor amendments were made by R A Old in 1988. It is included in 1:50 000 Sheet 184 (Warwick) published in 1984; an accompanying memoir is also published (Old and others, 1987).

The mapping and production of this report were partly funded by the Department of the Environment.

Copies of this report and uncoloured dyeline copies of the 1:10,000 map may be purchased from the Survey's office at Keyworth, Nottingham.

Parallel reports covering adjoining 1:10,000 sheets are:-

SP 36 NE Offchurch (Ambrose 1986)
SP 37 NW Coventry Central (Old 1988)
SP 37 NE Southeast Coventry (Sumbler 1985a)
SP 47 Rugby West (Sumbler 1985b)

A report on the sand and gravel resources of the area is given by Crofts (1982).

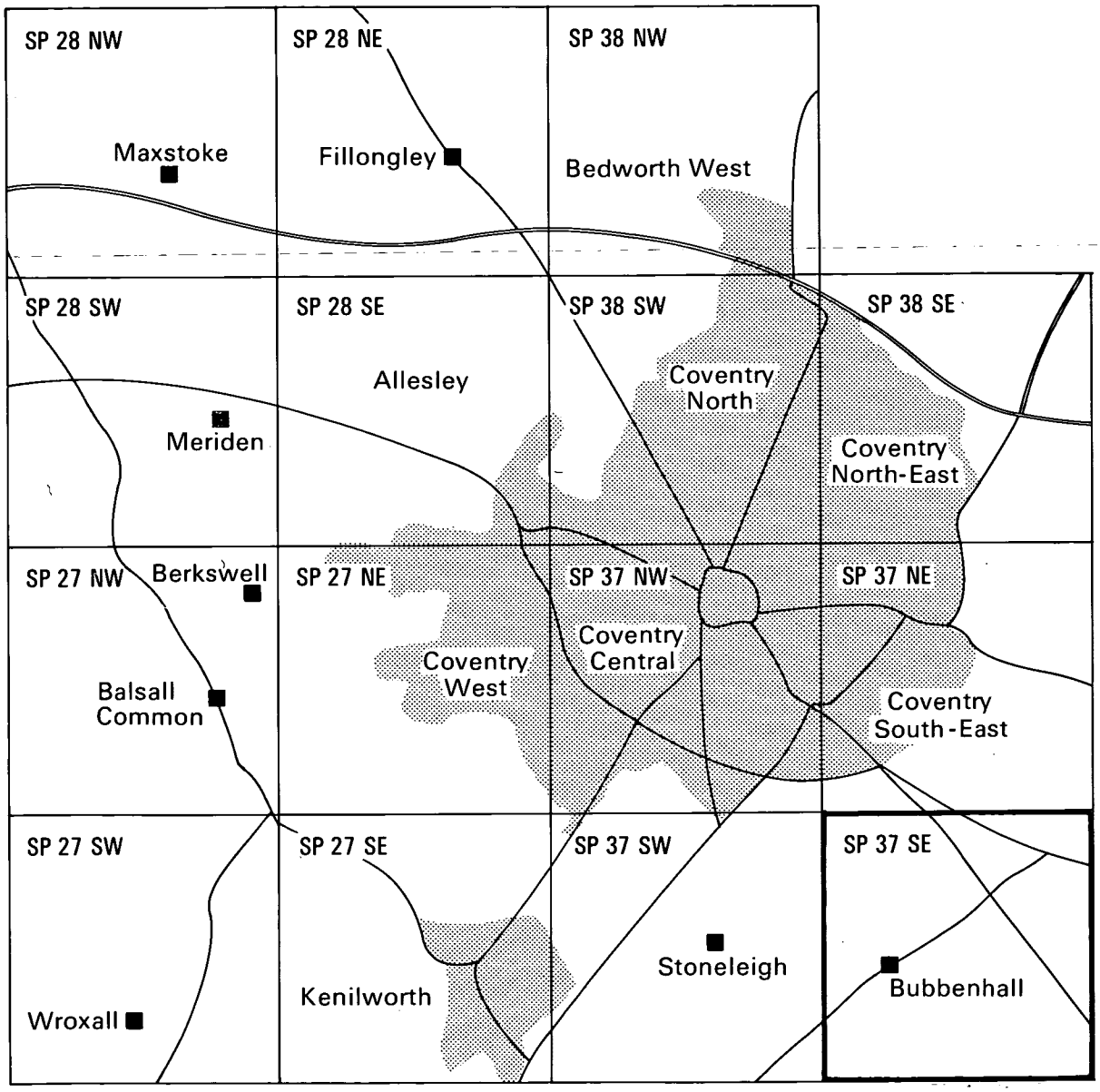

Figure 1. Area of this report relative to area of whole contract is shown with bold outline

GEOLOGICAL SEQUENCE

Beds down to the Tile Hill Mudstone are represented at outcrop or beneath drift. Lower beds are known from boreholes and the Binley Colliery workings.

Quaternary	Flandrian and Devensian	Alluvium
		River Terrace Deposits (1 to 4)
	Wolstonian	Dunsmore Gravel
		Upper Wolston Clay
		Wolston Sand and Gravel
		Lower Wolston Clay
		Thrussington Till
		Baginton Sand and Gravel
Triassic	Penarth Group	Langport Member
		Cotham Member
		Westbury Formation
	Mercia Mudstone Group	Blue Anchor Formation
		Red mudstone
		Arden Sandstone Member
	Sherwood Sandstone Group	Bromsgrove Sandstone Formation
Carboniferous (Westphalian A to D)	Enville Group	Tile Hill Mudstone Formation
		Coventry Sandstone Formation
		Keele Formation
		Halesowen Formation
		Etruria Marl Formation
	Productive Coal Measures	Middle Coal Measure
		Lower Coal Measures
Cambrian		Merevale Shales

CAMBRIAN

Merevale Shales

Boreholes have proved Cambrian rocks underlying the Westphalian of the Warwickshire Coalfield. The Ryton No. 1 borehole (3731 7397) proved 4.4 m of grey-green, slightly micaceous fissile mudstone and sandy mudstone dipping at 25 to 40°, below 904.2 m. Ryton No. 5A (3915 7430) penetrated c. 5.5 m of probable Cambrian rocks, including purple and dark grey fissile mudstones, below c.283.5 m. Ryton No. 1 yielded Dictyonema flabelliforme s.l., 'Acrotreta' sabrinae, and Lingulella c.f. nicholsoni, indicating a lower Tremadoc horizon, (Bulman and Rushton 1973), and Dr A.W.A. Rushton reports that samples below 645 m from the Burnthurst (1980) borehole (3919 7170) yielded Linnarssonia belti? and Clonograptus? also of Lower Tremadoc age.

These beds correspond in age and lithology with the Merevale Shales of the Nuneaton District (Taylor and Rushton 1971).

CARBONIFEROUS

With the exceptions of the Tile Hill Mudstone, which crops out west of Bubbenhall, Carboniferous rocks, all of Westphalian age, are known in this area only from boreholes and the Binley Colliery workings. The beds dip westwards, thus successively younger rocks incrop against the base of the Trias from west to east, and the basal Westphalian unconformity probably incrops not far east of the coal workings in the north-eastern part of the map. The logs of four coal exploration boreholes drilled near Ryton in the 1940's are given in the Appendix I. More details of these boreholes, together with graphic logs, are given by Sumbler (1985a) in an account relating to the whole of Binley Colliery and in Old and others (1987). Graphic logs of recent British Coal boreholes are shown in Figure 2. The classification of the Warwickshire succession is shown in Table 1.

WESTPHALIAN A

Strata of Westphalian A age consist mainly of cyclic sequences, ideally comprising grey mudstone (rarely marine), siltstone, sandstone, seatearth and coal, in ascending order. The Westphalian A/B boundary is defined by

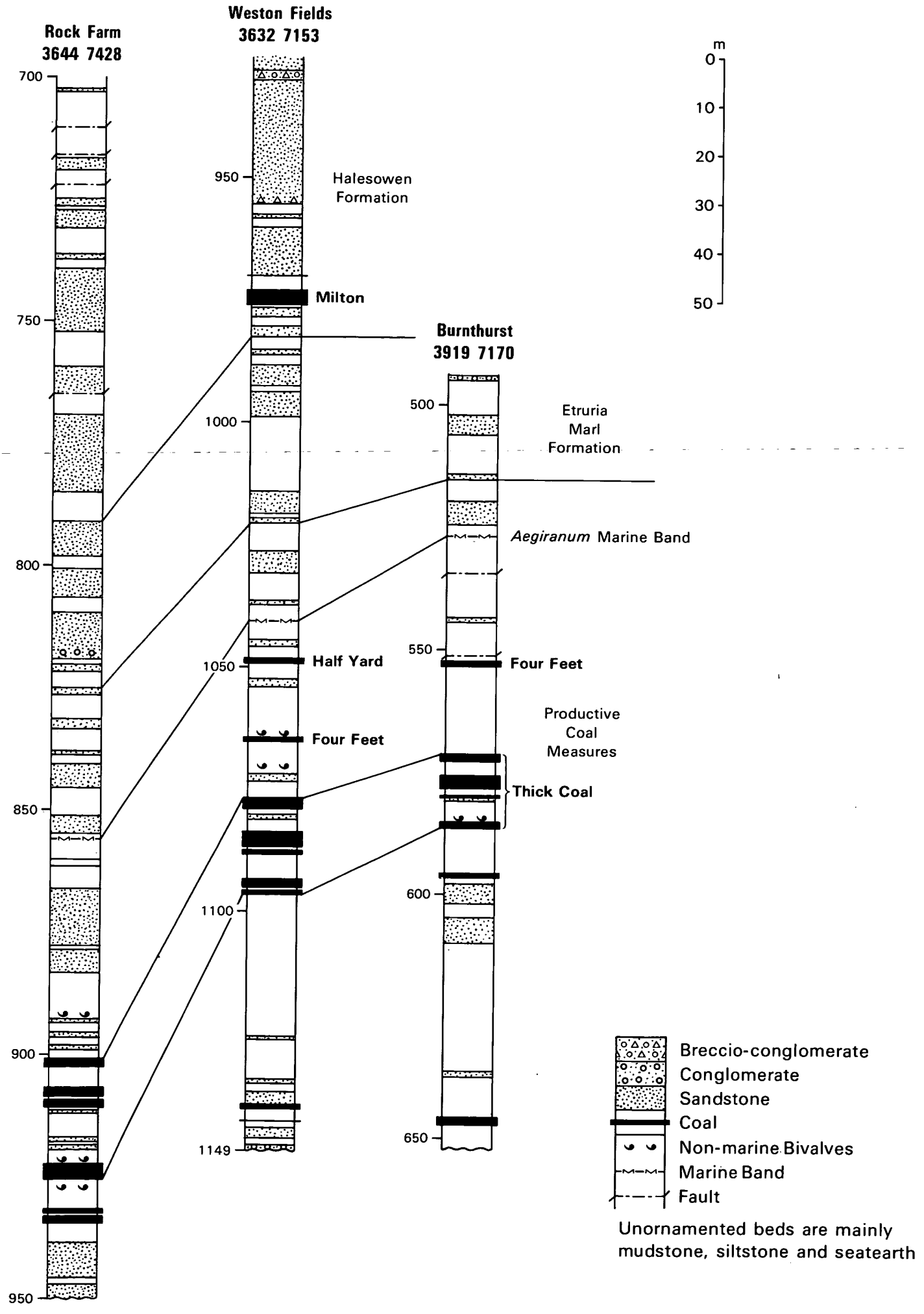

Figure 2. Comparative Westphalian successions in cored boreholes

Stages	Non-Marine Bivalve Zones (Trueman & Weir 1946)	Marine Bands	Warwickshire Succession	Lithostratigraphic Divisions	
				Mitchell (1942)	Stubblefield & Trotter (1957)
D	Prolifera Tenuis		Enville Group (part) Keele Formation Halesowen Formation	Upper Coal Measures	Upper Coal Measures
C	Phillipsii	Cambriense	Etruria Marl Formation		
	Upper Similis-Pulchra	Aegiranum	Nuneaton Marine Band	Productive Coal Measures	Middle Coal Measures
B	Lower Similis-Pulchra	Vanderbeckei	Seven Feet Marine Band		
	Modiolaris				
A	Communis				Lower Coal Measures
	Lenisulcata	Subcrenatum	Unconformity		

Table 1. Classification of the Westphalian of the Warwickshire Coalfield (in part based on Ramsbottom et al 1978 Plates 1 to 3)

the Vanderbeckei (Seven Feet) Marine Band ((Ramsbottom and others 1978). This marine band is absent in this area, and the A/B, junction is uncertain but by comparison with those areas to the north where the marine band is present, the boundary is unlikely to be more than about 10 m below the base of the Thick Coal. In Ryton No.5a, Westphalian A is c. 75 m thick, and in Ryton No. 1 probably 60 m. Further south it thins to as little as 45 m at Weston Fields (Figure 2). The bulk of the strata are mudstones and seat clays and the sandstones occurring in the basal beds to the north (Sumbler 1985a) are not well developed. A coal which may be the **Stumpy** of the more northern part of the coalfield was proved in the Ryton Nos. 1, 5 and 5a bores, about 17 m above the base of the Westphalian. The Bench coal may be represented by a seam 9 to 11 m higher (Appendix). In Ryton No 5a, coals at 237.4 m and 232.0 m may represent the **Double** and **Deep Rider** group of coals, but in Ryton No. 1, much sandstone occurs at this horizon, and it is possible that the coals are washed out.

Coals thought to represent the **Seven Feet** and **Thin** are the lowest seams that can be widely correlated in the Binley area, although their identification is uncertain due to the absence of the Vanderbeckei Marine Band. They have been named solely on the basis of their position beneath the Thick Coal group of seams. Although present in the Ryton No. 4 borehole, they were not proved in this area, probably due to poor sample recovery in the older boreholes or because they have died out. The measures between the coals consist largely of seat clay.

WESTPHALIAN B

Westphalian B strata, c 75 m thick in Ryton No. 1, constitute the highest normally productive measures of the Warwickshire Coalfield including the Thick Coal group of seams. Only the Nine Feet and Two Yard seams have been mined in this area; working ceased when Binley Colliery [3795 7728] closed in 1963. The strata are cyclic, as in Westphalian A.

The measures below the Thick Coal, 1.8 m thick in Ryton No. 4, consist of seat clays and mudstones, with dark mudstone towards the base. At their base is the Vanderbeckei Marine Band horizon although no evidence of marine beds has been found in this part of the coalfield.

Thick Coal Group

In this area the component seams of the Thick Coal are separated over a considerable vertical interval, and constitute parts of the Splitting, Split and Recombining zones defined by British Coal (Old and others, 1987). Details are only available for the older boreholes.

The **Smithy** is usually about 0.6 m in thickness, but reaches 1.37 m in Ryton No. 5 borehole. Between the Smithy and High Main coals are 3.5 to 4.5 m of seat clays and mudstones commonly with ironstone nodules.

A coal termed the **"Nine Feet"** is the lowest seam that has been worked from Binley Colliery. In the workings at Ryton-on-Dunmore it comprises a lower leaf about 1 m thick, and an upper leaf averaging 1.7 m, corresponding respectively with the **High Main** and true **Nine Feet** further north (Cope and Jones, 1970). The seat clay parting between the leaves is from 0.02 to 0.05 m thick in workings just north of the area, but increases southwards, reaching 0.8 m in Ryton No. 5 borehole. For this reason, only the upper leaf has been worked at Ryton.

The measures between the Nine Feet and the Ell are about 20 m thick in Ryton No. 5 and 5a bores, and perhaps 25 m in Ryton No. 4. They consist of mudstone and siltstone, often with a development of sandstone. Small south-south east trending washouts affect the Nine Feet in the workings at Ryton. The **Ell** coal was proved in the Ryton No. 5 and 5a boreholes, in which it was 1.37 and 0.91 m thick respectively. In these bores, the measures between the Ell and Ryder coals consist of 0.15 to 0.30 m of seat clay.

The **Ryder** and **Bare** together form a composite seam; the Ryder averages about 1.4 m in thickness, the Bare about 0.6 m. The coals are commonly separated by a parting of a few centimetres of seat clay, which reaches 0.46 m in Ryton No. 5a borehole. In Ryton No. 5a, the interval between the Bare and Two Yard consists of 7.6 m of seat clay and mudstone.

The **Two Yard** Coal is the highest seam to have been worked from Binley Colliery, averaging about 1.6 m in thickness. In the Binley area, the **Thin Rider** Coal, recognised by its mussel-bearing roof is usually 10 to 12 m above the Two Yard. However, in the Ryton No. 4 borehole, mussels

occur in the shale roof of the Two Yard, suggesting that the Thin Rider has joined the Two Yard in this area.

The measures between the Two Yard and Four Feet coals are 27 m thick in the Ryton No. 4, bore consisting mainly of seat clays and shaley mudstones. At Weston Fields they yielded Anthracosia atra/fulva, A. ex gr. atra, Carbonita sp., spirorbis sp. and fish debris.

The **Four Feet** averages 1.8 m of coal commonly split by a seat clay band just above the middle of the seam. At Weston Fields the roof of the Four Feet yielded A. ex gr. atra. The measures between the Four Feet and the Aegiranum Marine Band horizon are about 20 m thick in Ryton Nos 1 and 4 bores, and include much sandstone. At Weston Fields they included a coal correlated with the Half Yard. There is usually a thin coal (up to 0.3 m) immediately beneath the Aegiranum Marine Band

WESTPHALIAN C

The base of the Westphalian C stage is defined by the Aegiranum (Nuneaton) Marine Band, which is the highest and most widespread marine horizon in the Westphalian of the Warwickshire Coalfield. The full thickness of Westphalian C is about 62.5 m in the Ryton No. 1 borehole although in the absence of cores the upper limit is rather indefinite.

Measures Below the Etruria Marl Formation

These beds are 32 m thick in the Ryton No. 1 bore and probably about 44 m in Ryton No. 4. The Aegiranum Marine Band was proved in Ryton No. 1, but no fossils were collected; in Ryton No. 4 borehole, its position is only inferred. It was also proved in the more recent borehole (Figure 2) and at Weston Fields yielded Lingula mytilloides and Orbiculoidea sp. Above the dark grey mudstone of the Marine Band, the measures consist mainly of grey mudstones and seat earths, with some sandstones and thin coals (rarely up to 0.3 m).

Etruria Marl Formation

In the northern part of the Warwickshire coalfield the Etruria Marl consists of brown and red variegated "marls" with lenticular beds of

sandstone (Eastwood and others 1923; Mitchell 1942). In the southern part of the coalfield the Formation is by comparison poorly developed; it is represented by mudstones, siltstones and sandstones, mainly coloured grey, but always variegated red and brown, occurring between typical grey Productive Coal Measures and the Halesowen Formation. Many of the sandstones are coarse and gritty, but the conglomeratic "espley" rocks, which characterise the Etruria Marl farther north, are rare. The Formation is about 30 m thick, although the limits are rather indefinite.

WESTPHALIAN D

Halesowen Formation

The Halesowen Formation, is dominated by thick beds of coarse grey, feldspathic sandstone, interbedded with grey mudstones, siltstones, seatearths and rare coals. Regionally in the Warwickshire Coalfield there is an unconformity at the base of the Formation (Mitchell, 1942, p 13, Old and others, 1987) which eventually cuts out the whole of Westphalian A, B and C south of this area. There is little evidence of this in the Bubbenhall area, however, and the base of the Halesowen is indefinite due partly to the poor development of the Etruria Marl. At Weston Fields a coal near the base of the Formation is correlated with the Milton which occurs widely at this horizon in south Warwickshire and north Oxfordshire.

Only the lower part of the Halewsowen Formation has been cored, and the upper part is known only from chipping samples and down-hole geophysical logs. The upper limit of the Formation is,therefore, uncertain, but the probable thickness is about 125 m.

Keele Formation

The Formation has not been cored in this area and is known only from chipping samples. To the north it consists dominantly of red-brown mudstones with subordinate sandstones, and a few thin Spirorbis limestone beds (Eastwood and others 1923). The base is marked by a gradual change from the predominantly grey beds of the Halesowen Formation. The full thickness (apparently, 247 m) of the Keele Formation was proved in the Ryton No. 1 borehole.

ENVILLE GROUP

Coventry Sandstone Formation

The full thickness of the Formation has been penetrated only in the Rock Farm [3644 7428] and Weston Fields [3622 7153] British Coal boreholes; down-hole geophysical logs indicate that the Formation is c.300 to 310 m thick. It consists of sandstones, often coarse, interbedded with mudstones. Both sandstones and mudstones are dominantly red-brown in colour, but subordinate green grey patches and beds occur. Sandstones make up a large part of the Formation, and this distinguishes it from the underlying Keele and overlying Tile Hill Mudstone Formations, which are more argillaceous. Conglomeratic beds, and mudflake breccias are fairly common in the sandstone units.

In the Lodge Farm water borehole at Bagington [3640 7410], 64.8 m of Coventry Sandstone was cored below the base of the Tile Hill Mudstone at 89.9 m (Figure 3). Thick beds of red and occasionally grey sandstone make up 70% of the sequence, and thinner beds of red marl about 30%.

Tile Hill Mudstone Formation

The basal beds of the Tile Hill Mudstone Formation immediately overlying the Coventry Sandstone Formation were proved in the Lodge Farm borehole; 19.5 m of 'red marl' beneath the Trias, including 4.7 m of interbedded red sandstone and mudstone are assigned to this Formation.

In the Avon valley West of Bubbenhall, the upper part of the Tile Hill Mudstone Formation crops out on the upthrow side of the south-east trending Bubbenhall Fault. South of Bubbenhall Bridge, four sewerage boreholes proved mudstones beneath the First Terrace gravels; the deepest [3503 7249] proved "hard red and green marl" to 6.1 m, below 1.5 m of gravel. Debris from trenches 0.75 km south of the bridge [3523 7234; 3535 7526; 3524 7230] proved mudstone beneath the terrace deposits. The river bluff west of Bubbenhall Bridge is made up of tough red mudstones and siltstones, with some thin sandstone beds. North-east of the bridge [3522 7301] a roadside exposure showed 2 m of red, medium to coarse grained gritty sandstone. Dips varied from 15° to the south, to 10° to the north.

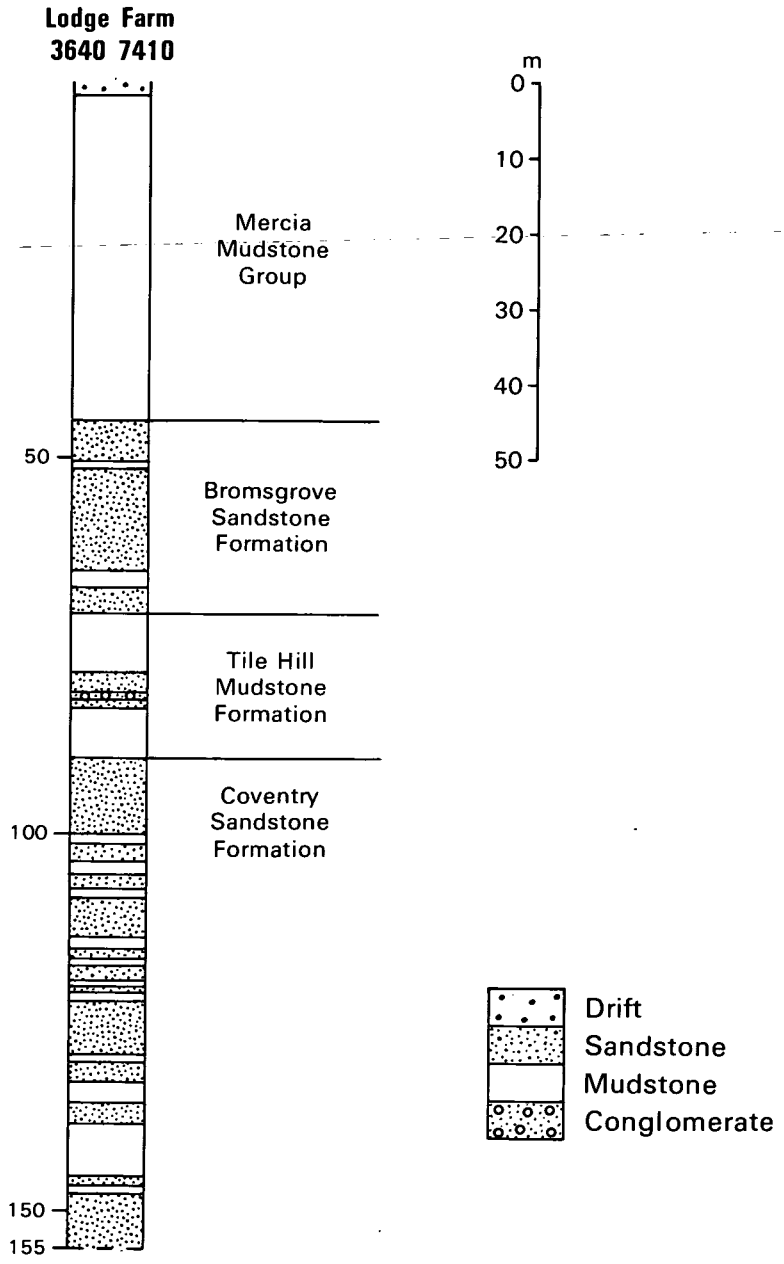

Figure 3. Vertical section of the Lodge Farm Borehole

The gamma log of the Weston Fields Borehole [3632 7153] records approximately 198 m of Tile Hill Mudstone, to a depth of 256 m, consisting mainly of mudstone but with sandstones up to 18.5 m thick. The Rock Farm Borehole [3644 7428] proved the basal 24 m of the Formation to 100 m.

TRIASSIC

Bromsgrove Sandstone Formation

The Bromsgrove Sandstone rests on Carboniferous or Cambrian rocks. It consists of about 25 m to 40 m of cross-bedded sandstones interbedded with mudstones which form up to 40% of its total thickness. The sandstones are grey to buff, with a gypsum or calcite cement when fresh, but weathering produces a soft buff or brown rock. They are generally well sorted, containing fine to medium grade quartz and feldspar, commonly with abundant mica concentrated on bedding planes and cross-laminae. The mudstone units are generally 1 to 2 m thick and of a dark red-brown colour, in some cases mottled green-grey. They are usually fairly massive and may be smooth, silty or sandy. The major sandstone beds invariably have sharp, erosive bases, and commonly contain layers of the intraformational mudstone-flake conglomerate. Many of the sandstones grade upwards into mudstone, forming fining-upwards cycles which suggest a fluvial environment. As would be expected from this model, individual sandstone and mudstone units are lenticular in form.

Bromsgrove Sandstone crops out on the south side of the Avon Valley south-west of Bubbenhall. It has been quarried at several sites east of Waverley Farm [3530 7177; 3535 7168; 3531 7141]. All these are ploughed over, but are marked by hollows with debris of soft, brown, fine to medium grained sandstone, with darker brown ferruginous spots. Two lenticular beds of mudstone near Waverley Farm give rise to damp clayey ground. The base of the upper 2-m bed, was exposed near Waverley Farm [3527 7134], where 0.4 m of red and grey-grey mottled mudstone rested on sandstone. At 'Fairies Hole', a small man-made cave 0.5 km southwest of Bubbenhall Church [3561 7228], 2 m of massive, level-bedded, medium to fine grained pink-brown sandstone was seen. An old quarry 0.25 km to the east-northeast [3586 7231] showed 5 m of massive, pale pink-brown sandstone, with cross-bedding indicating derivation from the south and west. The outcrop is cut by the southeast trending Bubbenhall Fault which downthrows the Formation roughly 20 m to the northeast. On the downthrow side, the

Bromsgrove Sandstone crops out in the river bluff north of Bubbenhall Church, beneath basal Mercia Mudstone. A borehole 30 m north-east of the Church [3600 7262] proved 1.8 m of soft green sandstone, beneath Mercia Mudstone.

West of Bubbenhall Bridge [3508 7297] 0.4 m of pale buff fine-grained micaceous sandstone was exposed, close above Tile Hill Mudstone.

About 1 km north of Bubbenhall, Bromsgrove Sandstone was formerly worked for building stone in Rock Spinney, but the quarries are now largely overgrown. A section [3620 7357] showed 2.0 m of massive sandstone, with large load casts or erosional scours at the base, resting on 0.5 m of red sandy mudstone. Just to the north, the Bromsgrove Sandstone is faulted against Mercia Mudstone by the northwest trending Princethorpe Fault which here has a throw of about 45 m.

The Lodge Farm Borehole (Figure 3) penetrated the full thickness (26 m) of Bromsgrove Sandstone, consisting mainly of grey sandstone with beds of 'red marl'.

MERCIA MUDSTONE GROUP

The Mercia Mudstone Group comprises the red mudstones formerly known as the "Keuper Marl", and the overlying green mudstones, of the Blue Anchor Formation. The red mudstones are of the order 170 m thick, and the Blue Anchor Formation about 7 m.

Red Mudstones (Keuper Marl)

These beds consist predominantly of blocky, red-brown mudstone, with a thin unit of green-grey sandstone and mudstone, the Arden Sandstone, about 120 - 130 m above the base.

The basal beds commonly consist of green-grey silty clay, probably corresponding with the Waterstones facies proved in the B.G.S. Home Farm borehole [4317 7309] [Sumbler 1980, 1985b]. They crop out southwest of Bubbenhall [354 714 to 359 719] where augering proved green-grey silty clay just above Bromsgrove Sandstone. In the B.G.S. Bubbenhall No. 2 borehole [3578 7167] 0.35 m of pale green-grey, sandy mudstone with ochreous patches was proved beneath 1.9 m of predominantly red-brown mudstone. Another

borehole close by [3575 7170] proved 0.61 m of 'soft blue sandy clay' resting on Bromsgrove Sandstone at 3.0 m and in a borehole 0.3 km southwest of Bubbenhall Church 0.76 m of 'stiff green clay' was proved beneath drift resting on Bromsgrove Sandstone at 3.4 m [3617 7230].

On the northeast (downthrow) side of the Bubbenhall Fault 30 m northeast of the Church, a bore proved 1.4 m of hard red marl above 0.46 m of 'stiff green clay' on Bromsgrove Sandstone at 3.5 m. A borehole at Rock Spinney [3610 7357] proved 0.55 m of 'hard green-grey and pale red-mottled, slightly shaly, silty clay', resting on Bromsgrove Sandstone at 1.8 m. A nearby section at the top of an old quarry [3613 7354] showed 1.4 m of green-brown mottled silty mudstone with sandstone lenticles, resting on Bromsgrove Sandstone.

Southeast and east of Bubbenhall, a large number of sand and gravel trial bores penetrated Mercia Mudstone beneath Baginton Sand and Gravel, proving red clay or marl. Ditches in the bottom of the Ryton Wood gravel pit [3721 7240] exposed 2.5 m of red blocky mudstone with some silty layers, and with small green-grey reduction spots.

In a ditch 1 km west of Ryton Police College [3715 7320] 1.5 m of red brecciated crumbly mudstone with irregular green blotches was exposed in a zone 3 m wide, either side of which the mudstones were more coherent. This may mark the outcrop of the Princethorpe Fault. On the northeast (downthrow) side of the fault, up to 5.8 m of red silty mudstone with some beds of green grey mottled mudstone and green siltstone were proved by a number of boreholes north of the Rock Farm Sewage Works [361 739]. The Lodge Farm borehole [3640 7410] proved 44.6 m of Mercia Mudstone, consisting mainly of 'red marl with green fish eyes', with 1.7 m of grey sandy marl, overlying 3.0 m of red and grey mottled marl at the base, corresponding with the lower part of the 'Waterstones' (see above).

Southeast of Ryton on Dunsmore, exposures and borehole records indicate the outcrop of the Arden Sandstone, mainly beneath drift. Reddish-purple mudstone associated with rarer green mudstone and siltstone was dug in the bottom of the Manor Farm gravel pit [3928 7367] (c.f. the distinctive top beds of the Arden Sandstone in the Home Farm Borehole, Sumbler 1980). The nearby Ryton No. 12 (1958) borehole [3922 7386] proved 1.5 m of 'red-brown, lilac and grey marl and silty marl' overlying 4.6 m of 'green-grey marl and silty marl' at 12.2 m, again suggestive of Arden Sandstone, although the

depths and thicknesses may be unreliable. Ryton No. 6 proved 3.0 m of 'grey sandy marl' beneath gravel at 10.7 m, and Ryton No. 7 proved 3.7 m of green 'marl' and grey sandstone bands at 15.5 m beneath gravel and red marl. Southwest of Manor Farm [386 733 to 389 738] a large number of sand and gravel trial bores proved green clay beneath drift. The Ryton No. 5 and 5a boreholes proved traces of 'grey marl' and 'light grey sandstone' immediately beneath drift gravel. In the road cutting just to the south [3914 7418] green-grey silty clay was augered just below the base of the drift.

A bore southeast of The Grange [3983 7383] proved 'green marly clay' to 1.8 m below drift, and gravel trial bores and exposures to the east (SP47; Sumbler 1985b) suggest the presence of Arden Sandstone, displaced south from the outcrops described above, by a north-south fault downthrowing c. 20 m to the west.

Blue Anchor Formation

The Blue Anchor Formation probably crops out beneath drift on the northeast side of the Princethorpe Fault, 3.5 km east of Bubbenhall. In the area to the east (Sumbler 1985b) it consists of 5 to 7 m of pale, green-grey massive, silty dolomitic mudstone.

Penarth Group

Formerly known as the Rhaetic, the Penarth Group is thought to be represented beneath drift on the northeast side of the Princethorpe Fault, near Bull and Butcher Farm [396 719]. It comprises the Westbury Formation, Cotham Member, and Langport Member in ascending order. In the adjacent area (Sumbler 1985b), the Westbury Formation consists of c 5 m of dark-grey to black fissile mudstones, and the Cotham Member 12 m of pale-green grey blocky mudstone. The Langport Member, formerly known as the White Lias, comprises about 2 m of white porcellanous limestone.

STRUCTURE

Little is known of the structure of the **Cambrian,** as it does not reach outcrop in the area. In boreholes, it is usually gently dipping, although dips up to 45°have been recorded. Viewed in their regional setting (Old and others 1987, Fig.2) the Cambrian rocks lie on the NW limb of a broad

NE-SW syncline which has been identified by plotting the faunal zones proved in boreholes. The fold movements in the Cambrian Rocks presumably date from the Caledonian orogeny.

The **Carboniferous** rocks lie on the eastern flank of the Warwickshire Coalfield, which has the form of a broad syncline, plunging gently to the south. Folding of the Carboniferous predated deposition of the Trias, which truncates the syncline, so that progressively older beds incrop eastwards against the Triassic unconformity. The incrop of the basal Carboniferous unconformity occurs in the eastern part of the area. The regional dip of the Carboniferous rocks is about 3 - 4° to the southwest, but dips steepen rapidly towards the incrop. This dip slackens again to the east in Binley Colliery workings, where the beds are affected by a belt of NNW-SSE folding 600 to 800 m across (Old and others 1987, Fig.3). East of this fold belt, the eastward rise of the beds at 15 to 30° resumes, and the coals are assumed to incrop just east of the workings.

The steepening dip of the Carboniferous as the incrop is approached suggests relative post-Carboniferous uplift by folding or faulting of the block of Cambrian basement to the east. The Carboniferous beds on the uplifted block were removed by erosion prior to deposition of the Triassic rocks. The minor folding in the colliery workings may be related to faulting in the underlying Cambrian or to the fold or fault bounding the Coalfield.

The **Triassic** beds dips to the south east at 1 to 2°. A number of faults have been mapped in the Trias, often on the basis borehole evidence. The fault offsetting the Arden Sandstone east of Ryton-on-Dunsmore (see above) may reflect structures in the underlying basement; its position approximates to the eastern limit of the Carboniferous. Although its throw is in the opposite sense, it probably joins with the Princethorpe Fault to the south, which geophysics suggests coincides with the Carboniferous incrop.

QUATERNARY

GLACIAL DRIFT

The glacial deposits of the area were first described by Shotton (1953). They form an orderly layered sequence which has been designated the

stratotype of the "Wolstonian" Stage of the British Quaternary (Shotton and West 1969). The nomenclature follows Sumbler (1983) and is modified after Shotton (1953). Figures 4 and 5 show the thickness of the drift deposits and the elevation of the sub-drift (rockhead) surface respectively.

Shotton (1953, p.213-214), recognised **'Bubbenhall Clay'** (supposed glacial deposits) apparently underlying Baginton Sand and Gravel at two localities regarding it as evidence of a separate older glaciation. In an augered traverse of Waverley Wood, [358 708], Shotton (1953, p.213 and fig. 10) found 'stoneless red silty clay...largely consisting of reworked Keuper Marl' (i.e. 'Bubbenhall Clay') in a valley bottom and at the break of slope at the base of the Baginton Sand and Gravel outcrop. A nearby section [357 718] (Shotton, op. cit.) showed 1.2 m of red sandy clay with scattered Bunter pebbles resting on Bromsgrove Sandstone. However, the BGS Waverley Wood No. 2 [3566 7147] and Bubbenhall No. 2 [3578 7168] boreholes, drilled on the main outcrop of 'Bubbenhall Clay' shown by Shotton (1953. fig. 9) each proved only thin head deposits resting on Mercia Mudstone. The IGS Bubbenhall No. 1 borehole [3583 7152] proved Baginton Sand and Gravel resting directly on Mercia Mudstone. Shotton's figured section shows that 'Bubbenhall Clay' was found only beyond the outcrop of the Baginton Sand and Gravel, and that where the Sand and Gravel was bottomed by augering it was found to rest upon Mercia Mudstone. Possibly then, the material described by Shotton is weathered Mercia Mudstone, or head derived from the Mercia Mudstone and nearby glacial drift deposits.

The **Baginton Sand and Gravel** is a fluvial deposit consisting of a basal gravel facies overlain by a sand facies (respectively the Baginton-Lillington Gravel and Baginton Sand of Shotton (1953)). Near the margins of the deposit, the basal gravel may be absent, having been overlapped by the sand. The maximum thickness of the deposit is about 10 m in the Bubbenhall and Ryton areas, where the gravel and sand are of about equal thickness.

The limits of the deposit indicate that it was laid down in a broad north-north-east draining valley, the 'Proto-Soar' (Shotton, 1953), bordered by the higher ground of the Enville Group on the west, and by the rising ground of the upper part of the Mercia Mudstone Group on the east. Deposits near Princethorpe occur in a south-westerly draining tributary valley.

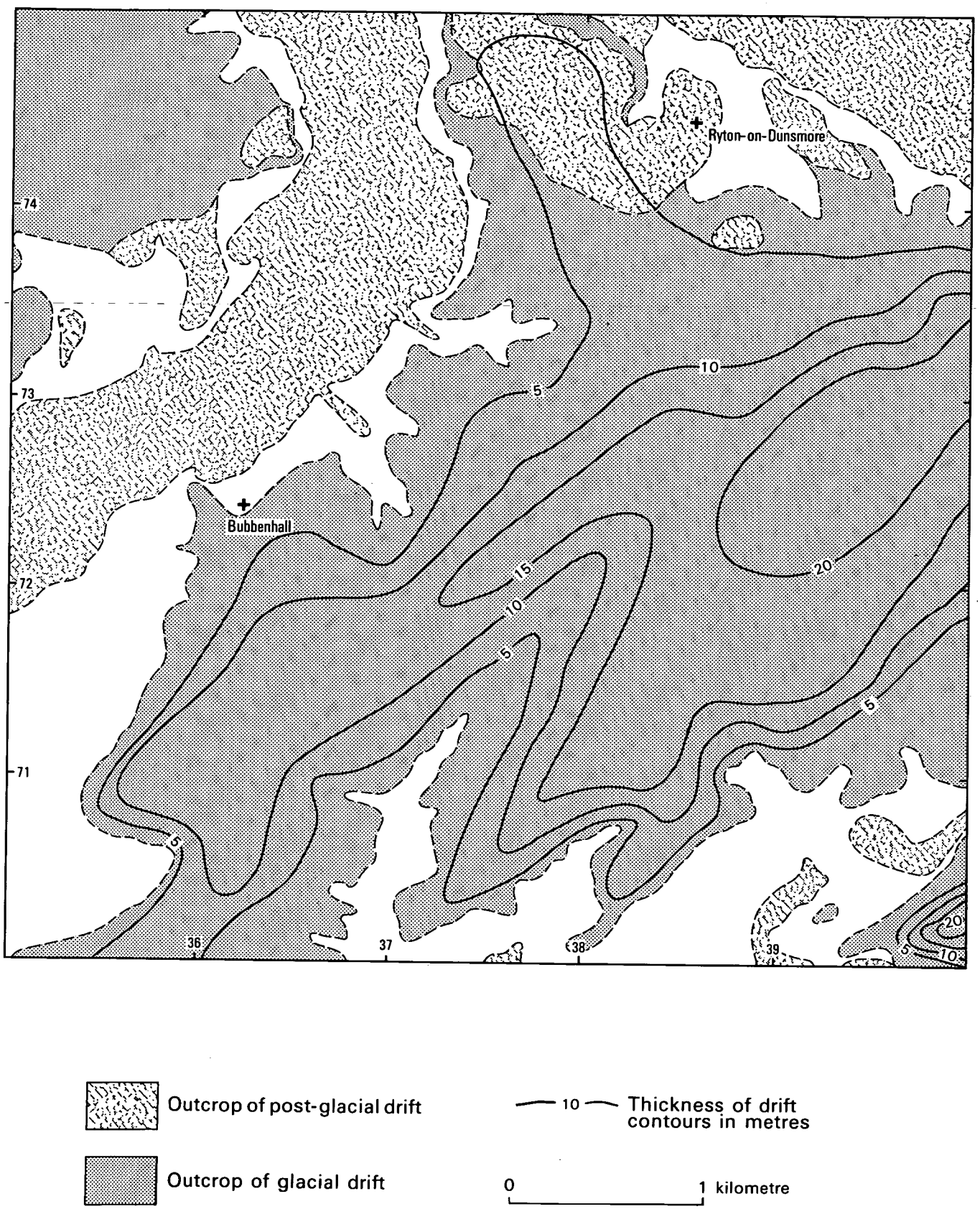

Figure 4. Thickness of drift deposits

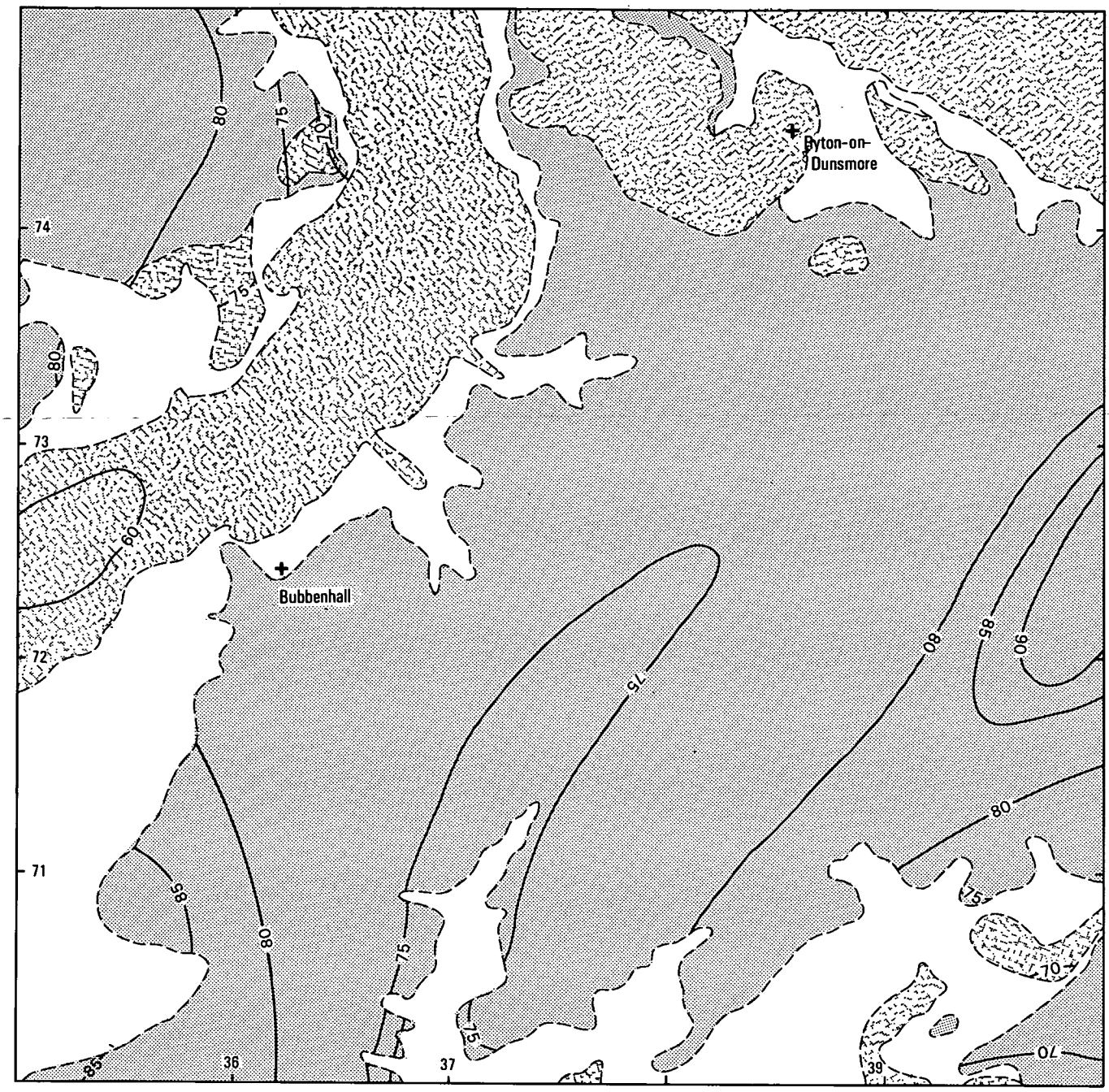

Figure 5. Elevation of sub-drift (rockhead) surface.

The gravel is generally clean and well sorted, the pebbles consisting almost entirely of well rounded Bunter quartzite pebbles. A pebble count on material from Ryton Wood Pit [374 726] gave the following results:-

	No.	%
Bunter quartzite pebbles	250	98.00
Upper Carboniferous sandstone	3	1.2
?Carboniferous chert	1	0.4
Triassic siltstone	1	0.4

In addition Shotton (1953 p. 214, 215)recorded 1% of "brown chert-like flint" possibly derived from Irish Cretaceous rocks, and also one specimen of Lake District andesite. The sand is generally medium to find grained, with many lenses of Bunter quartzite gravel, and coal fragments. Both sand and gravel facies are generally strongly cross-bedded. The dips of foresets are rarely consistent in any one locality, but in the pits at Ryton Wood, and Manor Farm they generally indicate a flow from between west and south.

The Baginton Sand and Gravel has been extensively worked southwest of Ryton-on-Dunsmore. A section at Ryton Wood pit [3764 7261] showed:-

Lower Wolston Clay and Thrussington Till	3.5 m
Baginton Sand: Pale red-brown, medium grained sand with some finer layers. Cross-bedded commonly with coal fragments on foresets. Top few centimetres level bedded	4.0
Baginton Gravel: Close-packed Bunter quartzite pebble gravel. Top 1 m seen; total thickness (on Mercia Mudstone)	c3

Both the sand and gravel are worked at Manor Farm Pit, 1 km south-south-east of Ryton-on-Dunsmore [392 737]. A composite section showed:-

Thrussington Till	3.0 m
Baginton Sand: Red cross-bedded sand with pebbly seams and coaly layers	3.0
Baginton Gravel: Close packed medium-grade Bunter quartzite gravel with lenses of medium to fine-grained red sand (on Mercia Mudstone)	4.0

In the south face of the pit 0.5 km northwest of Ryton-on-Dunsmore [3819 7485] up to 3 m of Baginton Gravel was exposed, consisting of coarse, brown Bunter quartzite gravel with seams of coarse sand.

At Waverley Wood pit [365 713] the Mercia Mudstone surface undulates and the base of the Baginton Sand and Gravel is preserved in a channel about 270 m across. A composite section of the whole pit is as follows:

Baginton Sand: Brown cross-bedded sand with a few coal-rich laminae; foresets, dip NE	6 m
Baginton Gravel: Coarse, cross-bedded gravel with sandy beds; pebbles mainly of Bunter quartzite but with some coal-rich laminae and a few coal pebbles several centimetres in diameter; a few Jurassic fossils including Gryphaea. Where the gravel abuts against the highest part of the Mercia Mudstone floor [3655 7128] there are abundant ironstone pellets.	2.8
Basal channel deposits (exposed in drainage trench in pit floor); dark grey organic-rich silt, thin bedded with a few pebbles at base and a few pieces of drifted wood up to 30 cm long; passes rapidly NE into well-bedded red-brown silt with thin gravelly layers and cross-bedding dipping SW (on Mercia Mudstone).	c2.0

In the writer's view the basal silts immediately predate the Baginton Sand and Gravel and were deposited in a small flood plain lake bounded by Mercia Mudstone. However, Professor F W Shotton (personal communication) considers that they are separated from the Baginton Sand and Gravel by an

unconformity. The site is currently being studied intensively by a group of researchers at Birmingham University, Coventry Polytechnic and the British Museum (Natural History), because the basal silt and the sand and gravel are fossiliferous. Both have yielded mammalian remains and the silts insects and pollen. The base of the gravels has yielded several hand-axes. The results of this research are not available at the time of writing.

The general distribution of the **Thrussington Till** is similar to that of the Baginton Sand and Gravel, although the latter is locally overlapped by the Till, which then rests directly on Mercia Mudstone. The Till is a tough red-brown clay containing erratics predominantly of green-grey sandstone and siltstone with subordinate red mudstone, Bunter quartzite pebbles, Carboniferous sandstone and small fragments of coal. The green sandstones and siltstones commonly occur as large blocks often clearly striated, and, together with the red mudstone pebbles and red-brown clay matrix are evidently largely derived from the Mercia Mudstone, but may include some Bromsgrove Sandstone and Enville Group rocks. Rarer erratics include Leicestershire diorites, Westphalian ironstone and Carboniferous limestones. The Till is quite sandy in parts possibly due to incorporation of Baginton Sand and Gravel, which may also have contributed some of the Bunter quartzites and coal.

The Thrussington Till forms a sheet typically 3 to 5 m thick, and probably not exceeding 6 m anywhere in this area. The contact with the underlying Baginton Sand and Gravel is flat lying, and in exposures is usually sharp and flat, with little or no disturbance of the Sand and Gravel. Near Weston Fields Farm, however, [369 709; 365 702] undulations in the base of the Till cut out the Baginton Sand and Gravel.

The B.G.S. Burnthhurst Farm borehole [3880 7158] (Sumbler 1981) proved the upper 1.7 m of Thrussington Till, beneath Wolston Clay, consisting of crumbly red-brown clay with many Triassic sandstone and siltstone and Bunter quartzite pebbles, and a few coal specks.

The Till is well exposed in several pits, where it forms the overburden above Baginton Sand and Gravel. At the south end of Ryton Wood Pit [3746 7210] 3.5 m of red-brown clay with Triassic sandstone and siltstone, and Bunter quartzite pebbles was seen, the basal 0.2 m being very sandy. The junction with the underlying Baginton Sand was very sharp, but undulating. The Till graded upwards into Wolston Clay, through becoming darker and

greyish-brown, and by a reduction in the size and quantity of the clasts. At the north end of the pit [3789 7271] 4 m of Till with large blocks of Triassic sandstone and siltstone and a few pods of brown sand, was exposed beneath Wolston Clay. The junction with the underlying Baginton Sand, exposed over a considerable distance, was flat-lying. In a section 250 m to the south-west [3764 7260] the Till had thinned to 2.2 m.

In Manor Farm Pit [3933 7363] 3 m of Till was exposed above Baginton Sand. Just to the southwest of the pit [389 735] mapping and gravel trial bores indicate a depression in the base of the Till, similar to those described above.

The **Wolston Clay** is typically an almost stoneless clay or silty clay, with numerous silt laminae, but locally contains bodies of till. It is primarily a still-water deposit laid down in glacial lakes and ponds. The clays are usually grey-brown when fresh, but weather to a reddish colour. They are usually somewhat calcareous, particularly in the upper part of the sequence. The Wolston Clay reaches a maximum thickness of about 18 m in the area south of Ryton, where it is split into Lower and Upper divisions by the Wolston Sand and Gravel.

Debris from an excavation 0.3 km northeast of Hill Farm, Wappenbury [3830 7051] consisted of grey-brown clay with scattered pebbles including Bunter quartzite, flint and rare chalk, Lias limestone and derived Gryphaea.

A cutting on the Fosse Way 0.7 km southwest of Princethorpe [3988 7021] exposed 2.5 m of till-like Wolston Clay, consisting of stiff red-brown clay with abundant Triassic siltstone, rare chalk, and a Leicestershire diorite boulder, resting on 1 m of brown silty clay and silt.

In the B.G.S. Burnthhurst Farm borehole (Sumbler 1981), the Lower Wolston Clay was 12.6 m thick and consisted mainly of smooth brown grey plastic clay with laminae of pale brown silt, together with some more uniform silty clay layers and a few beds of fine sand in the upper part. The lowest 2 m contained rare pebbles of red Triassic mudstone and green-grey siltstone and sandstone, and graded downwards into Thrussington Till. The uppermost 2.5 m below the Wolston Sand and Gravel contained many Bunter quartzite and Triassic siltstone pebbles. The Upper Wolston Clay was 3.2 m thick, and again consisted of laminated clay, in part layered with silt, but was more blue-grey in colour than the Lower Wolston Clay. The clay contained rare

Bunter quartzite and Triassic siltstone pebbles, and in the basal 0.3 m much chalk.

About 1 m of smooth, brown Lower Wolston Clay, grading down into Thrussington Till was seen at several points in the overburden of the Ryton Wood Pit [3747 7210; 3673 7260; 3789 7271].

In Ryton Wood a borehole [3756 7225] proved 4.9 m of reddish-brown Upper Wolston Clay, above Wolston Sand and Gravel. A second bore 0.4 km to the northeast [3784 7250] proved 6.4 m of Upper Wolston Clay, above Wolston Sand and Gravel. The Lower Wolston Clay ("brown clay") was respectively 4.7 and 2.1 m thick, above c.3.4 and 6.4 of Thrussington Till ("red clay"). Shotton (1953, fig. 10) figures an augered section through Ryton Wood, suggesting that the combined thickness of the Lower Wolston Clay and Thrussington Till is about 7 m which is confirmed by the above boreholes.

The **Wolston Sand and Gravel** forms an almost continuous outcrop, close to the 91 m contour, southeast of Ryton-on-Dunsmore. It consists of up to 3 m of red, fine grained sand and silt with many lenses of plastic Wolston Clay and a thin basal layer of small pebbles. It locally gives rise to strong groundwater seepage. Unusually broad outcrops in Weston Wood [357 702] and Waverley Wood [358 710] occur where it forms hilltop outliers. An augered section through these outcrops (Shotton 1953, fig. 10) showed the sand to be c.3 m thick.

The Wolston Sand and Gravel in the B.G.S. Burnthurst Farm borehole (Sumbler 1981) consisted of 1.0 m of very fine-grained red sand, slightly clayey in parts, with some Bunter quartzite and green Triassic siltstone pebbles in the basal 0.3 m.

Shotton's (1953, fig. 10) augered section across Ryton Wood proved the Wolston Sand and Gravel to be about 3 m thick, including in the southeast,bands of plastic clay in the upper part. The boreholes in Ryton Wood mentioned above proved 0.8 m of 'orange brown fine sand', and 0.6 m of "clay and sand" on 1.8 m of 'brown sand' respectively.

The **Dunsmore Gravel** is the uppermost member of the glacial drift sequence. It is a sheet like deposit rarely exceeding 5 m in thickness which forms a plateau on the high ground southeast of Ryton. It is a brown, commonly ochreous, poorly sorted, sandy, clayey gravel containing lenses of sand,

and is generally particularly clayey in the lower part. Constituent pebbles are mainly subangular flints and rounded Bunter quartzites. Cobbles of Carboniferous sandstone also occurs, and Jurassic ironstone is usually present. Locally where unweathered at depth, the gravel contains some Jurassic limestone and chalk, but the upper layers are invariably leached and decalcified. There is usually an ochreous layer of iron enrichment just below the ground surface, and a layer of hardpan consisting of gravel cemented by purple-black limonite is commonly developed. The base of the Dunsmore Gravel is locally channelled into the underlying Wolston Clay. In the Burnthurst Farm borehole (Sumbler, 1981), the Dunsmore Gravel was 1.5 m thick. Crofts (1982) lists several boreholes proving up to 3 m of Dunsmore Gravel, and gives a number of pebble counts.

River Deposits

Gravel deposits, corresponding with terraces 1, 2 and 4 of Shotton (1953) are developed in the Avon valley and small spreads of gravel and loam are present along the Leam tributaries in the Princethorpe area. They are largely derived from older drift deposits and younger terraces may consist in part of material reworked from older terraces. All the terraces are thus compositionally similar, and are differentiated solely on the basis of height. Like the Dunsmore Gravel they are composed dominantly of flint and Bunter quartzite pebbles, but are generally better sorted and less clayey.

Fourth Terrace gravels form broad flats along the Avon, around 15 m above the modern flood-plain. Their distribution shows that the fourth terrace floodplain was up to 2 km across. The fourth terrace may be early Devensian (Shotton, 1968) or Wolstonian (Sumbler 1983) in age.

Sections in old gravel pits southwest of Ryton-on-Dunsmore show that the fourth terrace gravels are thin, and the bulk of the workings are in Baginton Sand and Gravel. Northwest of Ryton Lodge [375 744] up to 1.5 m of flinty terrace gravel rests on Baginton Sand. A section 400 m northeast of Ryton Lodge [3814 7425] showed 1.2 m of brown sand with a few flint and Bunter quartzite pebbles, above Baginton Sand.

Extensive spreads of **Second Terrace** gravels occur along the Avon. These deposits commonly slope gently downwards towards the river; possibly the second terrace bench was destroyed during later downcutting. The deposits extend up to c.8 m above the modern floodplain, and commonly extend below

the level of the first terrace. The second terrace is of mid-Devensian age (Shotton 1968).

Gravels up to 5 m thick were exposed in the pit 0.5 km northwest of Ryton-on-Dunsmore [382 750]. The base of the gravels is gently undulating and falls gradually northwards (towards the river). At the southern limit of the second terrace channel, the gravels are banked steeply against Baginton Sand and Gravel and Mercia Mudstone. A composite section [3824 7494 to 3815 7500] showed:-

Gravel, brown, ferruginous, weakly cemented, structureless with Bunter quartzite and flint pebbles	1.3 m
Sand, orange-brown, medium to coarse, becoming grey downwards, with silt and pebbly lenses; clayey near base	1.7 m
Clay, pale blue-grey, smooth becoming dark and peaty downwards with finely divided plant debris; pebbly near base	0.4 m
Gravel, brown, ferruginous, with large cobbles in lower part	1.5 m
Mercia Mudstone	0.6 m

The peaty deposit is restricted to the margin of the channel and dies out rapidly northwards, but occurs over the whole 150 m width of the pit. A similar deposit on the north side of the river (SP 37 NE) is described by Shotton (1968).

The **First Terrace** is well developed along the Avon and borders the flood-plain on one side of the river or the other almost continuously. In a number of places the terrace is divided into two levels, 1a and 1b. Terrace 1b corresponds in height with the undivided first terrace, and terrace 1a is somewhat lower, usually 1 m or so above the modern alluvium. The deposits, rarely exceeding 3 to 4 m in thickness consist of loamy sand and gravel, commonly very clayey near the surface. The gravel consists dominantly of Bunter quartzite and flint pebbles, like the older terraces, but is finer in overall grade.

There is no direct evidence for the age of the first terrace deposits in this area, but judging from the supposed ages of the second terrace, and the alluvium, they are presumably late Devensian, or early Flandrian.

A number of boreholes penetrate the first terrace south of Bubbenhall Bridge. One [3525 7238] proved 4 m of brown sandy clayey gravel and another [3501 7251] proved 1.7 m of similar deposits.

Alluvium forming the Avon flood plain consists of an upper layer of loamy clay underlain by a basal lag deposit of gravel. There is no direct evidence of the age of the alluvium, but it is presumed to be wholly Flandrian

INDUSTRIAL MINERALS

Coal

The area lies at the southern end of the South Warwickshire Prospect, a coalfield completely concealed by younger rocks. Details of the coal-bearing strata are given in the Westphalian and Structure sections of this report. All of the recoverable reserves are in the Thick Coal and isopachytes and nomenclature for this seam have been published by British Coal (National Coal Board 1985; British Coal Corporation, 1987). The coal would provide excellent domestic, industrial and power station fuels.

Sand and Gravel

Most of the larger deposits of sand and gravel have at some time been worked, with the exception of the Dunsmore Gravel, which is too clayey for most purposes. The more recent workings have been concentrated in the Bubbenhall and Ryton areas, where the main source is the Baginton Sand and Gravel. The Sand is normally extracted in a separate operation to the underlying Gravel, to minimize the need for grading the product. Large areas of sand and gravel have been worked out, although at the time of survey, pits still operated at Waverley Wood Farm [363 716], Ryton Wood [379 728], Manor Farm [392 737] and northwest of Ryton [382 747]. In 1988 the only pit operating was at Waverley Wood. Southwest of Ryton [380 742] fourth terrace gravels have been worked in conjunction with the underlying Baginton Sand and Gravel, and first and second terraces have been worked near Ryton [382 750].

Although much of the outcrop of the Baginton Sand and Gravel is either worked out, or built over, large areas of potentially workable sand and gravel remain, mainly in the Bubbenhall area. Although thin, some of the large spreads of terrace gravel may be of economic value.

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APPENDIX I

Logs of selected boreholes. The numbers are those of the BGS 1:10,000 record system, in which they are prefixed SP 37 SE. Depths and thicknesses are given in metres

2. Ryton No. 5 (1948)

[3916 7431] SL+ 80.6

Triassic	to 153.9
Two Yard 1.82	at 158.8
Bare 0.53	at 165.7
Ryder 1.37	at 167.2
Ell 1.37	at 168.7
'Nine Feet' U.Leaf 1.90	at 191.2
'Nine Feet' L.Leaf 1.01	at 193.0
Smithy 1.37	at 198.2
Coal 0.15	at 223.0
Coal 0.30	at 232.6
Coal 0.30	at 234.4
?Bench 0.84	at 252.1
?Stumpy seen to 0.91	at 261.8

3. Ryton No. 5a (1949)

[3915 7430] SLt 80.5

Triassic	to 149.4
Two Yard 1.22	at 164.0
Bare 1.37	at 173.0
Ryder 0.91	at 174.3
Ell 0.91	at 175.6
'Nine Feet' U.Leaf 1.52	at 196.1
'Nine Feet' L. Leaf 0.99	at 197.9
Smithy 1.14	at 203.4
Coal 0.40	at 232.0
Coal 0.30	at 237.4
?Bench 0.91	at 256.0
?Stumpy 1.22	265.0
Carboniferous	to 283.5
Cambrian	seen to 289.0

32. Ryton No. 1 (1946)

[3731 7397] SL+ 70.2

Triassic		to 112.8 m
Enville Group		to 312.7
Kuele Formation		to 559.3
Etruria Marl Formation		to 734.9
Coal, 0.23		at 737.0
Coal 0.08		at 756.6
Coal 0.15		at 758.8
Aegiranum M.B.		at 766.6
Coal 0.18		at 766.7
Four Feet 1.68		at 786.4
Coal 0.46		at 820.4
?Two Yard 0.61+		at 831.6
?Bench 0.30		at 875.7
?Stumpy 1.68		at 887.0
Carboniferous		to 904.2
Cambrian	seen	to 908.6

30. Ryton No. 4 (1948)

[3872 7491] SL+ 67.1

Triassic		to 107.0
Etruria Marl Formation		to 131.7
Coal 0.05		at 138.1
?Aegiranum M.B.		at 175.9
Coal 0.13		at 176.1
Four Feet 0.15+		at 198.7
Coal 0.15		at 208.0
Two Yard 1.12		at 226.7
Bare, Ryder, Ell 1.37		at 237.6
'Nine Feet' U.Leaf 1.68		at 264.6
'Nine Feet' L. Leaf 1.07		at 266.2
Smithy 0.61		at 270.4
Thin 0.51		at 272.7
?Seven Feet 0.84		at 274.8
Coal 0.08		at 293.0
Carboniferous	seen	to 293.5

APPENDIX II. Schedule of boreholes on Sheet SP 37 SE

BOREHOLE REF.NO. SP37SE		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
1		RYTON NO.12 RYTON ON DUNSMORE	3923	7385	161.85	1958
2		N.C.B.RYTON NO.5 RYTON ON DUNSMORE	3916	7431	261.82	1948
3		N.C.B.RYTON NO.5A RYTON ON DUNSMORE	3915	7430	288.95	1949
4		BUBBENHALL SEWERAGE NO.1 BUBBENHALL	3525	7236	5.03	1963
5		BUBBENHALL SEWERAGE NO.2 BUBBENHALL	3565	7239	5.12	1963
6		BUBBENHALL SEWERAGE NO.3 BUBBENHALL	3600	7262	5.33	1963
7		BUBBENHALL SEWERAGE NO.4 BUBBENHALL	3617	7231	4.88	1963
8		BUBBENHALL SEWERAGE NO.5 BUBBENHALL	3575	7170	6.71	1963
9		BUBBENHALL SEWERAGE NO.6 BUBBENHALL	3503	7249	6.10	1963
10		BUBBENHALL SEWERAGE NO.7 BUBBENHALL	3501	7250	5.48	1963
11		BUBBENHALL SEWERAGE NO.8 BUBBENHALL	3500	7252	4.57	1963
12		BAGINTON AIRPORT BH1 BUBBENHALL	3558	7493	4.07	1945
13		BAGINTON AIRPORT BH2 BUBBENHALL	3546	7475	3.12	1945
14		BAGINTON AIRPORT BH3 BUBBENHALL	3537	7454	5.33	1945
15		BAGINTON AIRPORT BH4 BUBBENHALL	3517	7424	5.49	1945
16		BAGINTON AIRPORT BH5 BUBBENHALL	3574	7451	3.51	1945
17		BAGINTON AIRPORT BH6 BUBBENHALL	3572	7470	3.51	1945
18		BAGINTON AIRPORT BH7 BUBBENHALL	3540	7467	14.78	1945
19		BAGINTON AIRPORT BH8 BUBBENHALL	3575	7448	3.05	1945
20		BAGINTON AIRPORT BH9 BUBBENHALL	3634	7375	11.51	1945
21		BAGINTON AIRPORT BH10 BUBBENHALL	3579	7398	1.68	1945
22		LONG FIELD BUBBENHALL	3628	7238	41.15	1952
23		PROPOSED NEW RECTORY BUBBENHALL	3633	7217	30.48	1953
24		WOOD FARM BUBBENHALL	3714	7146	36.58	1947
25		PRINCETHORPE HOUSE	3863	7095	45.72	1957
26		HILL FARM WAPPENBURY	3816	7024	54.86	1954
27		NUMBER NOT USED				
28	A	RYTON ON DUNSMORE NO 8A	3923	7466	149.35	1957
28	B	RYTON ON DUNSMORE NO.8B	3923	7466	111.25	1957
29		BAGINTON LODGE FARM	3640	7410	154.69	1942
30		RYTON NO.4 BH	3872	7491	293.52	1948
31		COVENTRY CITY F.C. RYTON	3839	7362	16.15	1971
32		RYTON NO.1 BH	3731	7397	908.30	1946
33		RYTON NO.6 BH	3889	7362	457.20	1952
34		RYTON NO.7 BH	3906	7357	377.92	1952
35	c	ROCK FARM BH509 WARKS	36439	74280	950.04	1976
36	c	STONELEIGH ESTATE CHANTRY HEATH SE-CH-5	3501	7293		1978
37	c	WAVERLEY WOOD FARM GRAVEL TRIALS BHA	3651	7167		1976
38	c	WAVERLEY WOOD FARM GRAVEL TRIALS BHB	3638	7152		1976
39	c	WAVERLEY WOOD FARM GRAVEL TRIALS BHC	3644	7144		1976
40	c	WAVERLEY WOOD FARM GRAVEL TRIALS BHD	3643	7128		1976
41	c	WAVERLEY WOOD FARM GRAVEL TRIALS BHD2	3643	7130		1976
42	c	WAVERLEY WOOD FARM GRAVEL TRIALS BHE	3676	7119		1976
43	c	WAVERLEY WOOD FARM GRAVEL TRIALS BHF	3658	7119		1976
44	c	WAVERLEY WOOD FARM GRAVEL TRIALS BHG	3632	7119		1976
45	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/1	3735	7223		1976
46	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/2	3745	7233		1976
47	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/3	3749	7239		1976
48	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/4	3759	7253		1976
49	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/5	3765	7266		1976
50	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/6	3777	7272		1976
51	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/7	3796	7277		1976
52	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/8	3811	7277		1976
53	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/9	3740	7218		1976
54	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/10	3742	7222		1976
55	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/10+1	3740	7224		1976
56	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/11	3751	7233		1976

BOREHOLE REF.NO. SP37SE		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
57	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/12	3761	7244		1976
58	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/13	3767	7259		1976
59	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/14	3774	7269		1976
60	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/15	3790	7271		1976
61	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/16	3801	7273		1976
62	c	RYTON WOOD SAND&GRAVEL TRIALS BH A/17	3813	7271		1976
63	c	RYTON WOOD SAND&GRAVEL TRIALS BH P3	3756	7225		1976
64	c	RYTON WOOD SAND&GRAVEL TRIALS BH P5	3769	7240		1976
65	c	RYTON WOOD SAND&GRAVEL TRIALS BH P7	3777	7263		1976
66	c	RYTON WOOD SAND&GRAVEL TRIALS BH P8	3784	7250		1976
67	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 1	3599	7188		1976
68	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 2	3592	7182		1976
69	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 3	3585	7176		1976
70	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 4	3578	7171		1976
71	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 5	3586	7165		1976
72	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 6	3594	7171		1976
73	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 7	3601	7176		1976
74	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 8	3607	7183		1976
75	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 9	3608	7172		1976
76	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 10	3602	7165		1976
77	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 11	3608	7159		1976
78	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 12	3616	7179		1976
79	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 13	3622	7174		1976
80	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 14	3630	7170		1976
81	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 15	3623	7159		1976
82	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 16	3616	7155		1976
83	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 17	3615	7168		1976
84	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 18	3636	7178		1976
85	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 19	3641	7189		1976
86	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 20	3653	7184		1976
87	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 21	3645	7181		1976
88	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 22	3599	7125		1976
89	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 23	3610	7141		1976
90	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 24	3602	7145		1976
91	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 25	3594	7151		1976
92	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 26	3586	7156		1976
93	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 27	3582	7149		1976
94	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 28	3588	7141		1976
95	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 29	3594	7132		1976
96	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 30	3581	7161		1976
97	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 31	3610	7183		1976
98	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 32	3596	7158		1976
99	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 33	3591	7161		1976
100	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 34	3598	7169		1976
101	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 35	3605	7174		1976
102	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 36	3585	7172		1976
103	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 37	3593	7176		1976
104	c	BUBBENHALL DIOCESE SAND&GRAVEL TRIALS 38	3600	7182		1976
105	c	MISS NEWTONS LAND SAND&GRAVEL TRIALS 1	3975	7395		1976
106	c	MISS NEWTONS LAND SAND&GRAVEL TRIALS 2	3968	7394		1976
107	c	MISS NEWTONS LAND SAND&GRAVEL TRIALS 3	3976	7383		1976
108	c	MISS NEWTONS LAND SAND&GRAVEL TRIALS 4	3978	7388		1976
109	c	MISS NEWTONS LAND SAND&GRAVEL TRIALS 5	3991	7396		1976
110	c	MISS NEWTONS LAND SAND&GRAVEL TRIALS 6	3986	7387		1976
111	c	MISS NEWTONS LAND SAND&GRAVEL TRIALS 7	3983	7383		1976
112	c	MISS NEWTONS LAND SAND&GRAVEL TRIALS 8	3994	7377		1976
113	c	MISS NEWTONS LAND SAND&GRAVEL TRIALS 9	4000	7392		1976
114	c	MISS NEWTONS LAND SAND&GRAVEL TRIALS 10	3973	7402		1976

BOREHOLE REF.NO. SP37SE		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
115	c	WAVERLEY WOOD FARM BH W57	3688	7130		1976
116	c	WAVERLEY WOOD FARM BH W7	3678	7121		1976
117	c	WAVERLEY WOOD FARM BH W30	3651	7120		1976
118	c	WAVERLEY WOOD FARM BH W38	3680	7110		1976
119	c	WAVERLEY WOOD FARM BH W53	3616	7108		1976
120	c	WAVERLEY WOOD FARM SAND&GRAVEL TPS 1	3684	7119		1976
121	c	WAVERLEY WOOD FARM SAND&GRAVEL TPS 2A	3664	7132		1976
122	c	WAVERLEY WOOD FARM SAND&GRAVEL TPS 2&4	3669	7130		1976
123	c	WAVERLEY WOOD FARM SAND&GRAVEL TPS 3	3660	7141		1976
124	c	WAVERLEY WOOD FARM SAND&GRAVEL TPS 5	3681	7126		1976
125	c	WAVERLEY WOOD FARM SAND&GRAVEL TPS 6	3643	7142		1976
126	c	WAVERLEY WOOD FARM SAND&GRAVEL TPS 7	3680	7112		1976
127	c	WAVERLEY WOOD FARM SAND&GRAVEL TPS 8	3642	7158		1976
128	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH1	3938	7377		1976
129	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH2	3937	7374		1976
130	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH3	3946	7371		1976
131	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH4	3928	7366		1976
132	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH5	3923	7359		1976
133	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH6	3742	7367		1976
134	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH7	3911	7357		1976
135	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH8	3905	7360		1976
136	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH9	3909	7368		1976
137	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH10	3916	7363		1976
138	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH11	3914	7387		1976
139	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH12	3913	7377		1976
140	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH13	3921	7371		1976
141	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH14	3918	7385		1976
142	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH15	3925	7378		1976
143	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH16	3901	7349		1976
144	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH17	3908	7344		1976
145	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH18	3897	7341		1976
146	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH19	3896	7328		1976
147	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH20	3906	7336		1976
148	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH21	3943	7384		1976
149	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH22	3943	7378		1976
150	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH23	3931	7385		1976
151	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH24	3926	7392		1976
152	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH25	3919	7397		1976
153	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH26	3916	7404		1976
154	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH61	3935	7361		1976
155	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH62	3926	7357		1976
156	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH63	3932	7364		1976
157	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH64	3937	7370		1976
158	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH65	3916	7356		1976
159	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH66	3921	7353		1976
160	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH67	3913	7347		1976
161	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH68	3907	7352		1976
162	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH69	3903	7342		1976
163	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH70	3900	7334		1976
164	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH71	3922	7364		1976
165	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH72	3926	7373		1976
166	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH73	3915	7370		1976
167	c	WARWICKSHIRE C.C.EASTERN PROPERTY AH74	3919	7378		1976
168	c	WARWICKSHIRE C.C.EASTERN PROPERTY P1	3907	7343		1976
169	c	WARWICKSHIRE C.C.EASTERN PROPERTY P2	3918	7353		1976
170	c	WARWICKSHIRE C.C.EASTERN PROPERTY P3	3936	7367		1976
171	c	RODHOUSES LAND SAND & GRAVEL TRIALS BH7	3986	7446		1976
172	c	RODHOUSES LAND SAND & GRAVEL TRIALS BH8	3996	7439		1976

BOREHOLE REF.NO. SP37SE		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
173	c	RODHOUSES LAND SAND & GRAVEL TRIALS BH10	3994	7454		1976
174	A-C	RYTON POLICE COLLEGE 3 BHS	3825	7320	6.10	1969
175	c	HOME FARM SAND & GRAVEL TRIALS 81 BHS	388	735	*	1976
176	c	WAVERLEY WOOD FARMS SAND & GRAVEL 41 BHS	364	713	*	1967
177		BUBBENHALL BH1 WARKS	3583	7152	3.80	1978
178		BUBBENHALL BH2 WARKS	3578	7168	2.28	1978
179		WAVERLEY WOOD BUBBENHALL WARKS BH1	3572	7143	2.50	1978
180		WAVERLEY WOOD BUBBENHALL WARKS BH2	3566	7147	1.85	1978
181		ROCK FARM SLUDGE BAGINGTON BH1	3544	7380	8.00	1976
182		ROCK FARM SLUDGE BAGINGTON BH2	3572	7386	4.00	1976
183		ROCK FARM SLUDGE BAGINGTON BH3	3587	7382	4.00	1976
184		ROCK FARM SLUDGE BAGINGTON BH4	3606	7391	4.00	1976
185		ROCK FARM SLUDGE BAGINGTON BH5	3620	7403	7.00	1976
186		ROCK FARM SLUDGE BAGINGTON BH6	3642	7397	6.00	1976
187		ROCK FARM SLUDGE BAGINGTON BH7	3625	7385	6.00	1976
188		ROCK FARM SLUDGE BAGINGTON BH8	3609	7377	7.00	1976
189		ROCK FARM SLUDGE BAGINGTON BH9	3622	7364	5.00	1976
190		ROCK FARM SLUDGE BAGINGTON BH10	3610	7357	9.00	1976
191		ROCK FARM SLUDGE BAGINGTON BH11	3599	7333	3.00	1976
192		ROCK FARM SLUDGE BAGINGTON BH1	3560	7396	8.53	1967
193		ROCK FARM SLUDGE BAGINGTON BH2	3577	7388	0.66	1967
194		ROCK FARM SLUDGE BAGINGTON BH3	3599	7377	0.70	1967
195		ROCK FARM SLUDGE BAGINGTON BH4	3619	7367	0.72	1967
196	c	BRANDON WOOD FARM BRANDON BH A75	3953	7499		----
197	c	BRANDON WOOD FARM BRANDON BH A76	3961	7491		----
198	c	BRANDON WOOD FARM BRANDON BH A77	3946	7490		----
199	c	BRANDON WOOD FARM BRANDON BH A78	3936	7499		----
200	c	BRANDON WOOD FARM BRANDON BH A80	3928	7489		----
201	c	BRANDON WOOD FARM BRANDON BH A82	3919	7478		----
202	c	BRANDON WOOD FARM BRANDON BH A84	3934	7488		----
203	c	BRANDON WOOD FARM BRANDON BH A86	3911	7470		----
204	c	BRANDON WOOD FARM BRANDON BH A88	3898	7477		----
205	c	BRANDON WOOD FARM BRANDON BH A90	3893	7487		----
206	c	BRANDON WOOD FARM BRANDON BH A92	3907	7486		----
207	c	BRANDON WOOD FARM BRANDON BH A94	3901	7496		----
208	c	FEATHERSTONE-DILKE LAND BH39	3947	7439		1969
209	c	FEATHERSTONE-DILKE LAND BH40	3922	7443		1969
210	c	FEATHERSTONE-DILKE LAND BH41	3908	7447		1969
211	c	FEATHERSTONE-DILKE LAND BH42	3908	7459		1969
212	c	FEATHERSTONE-DILKE LAND BH43	3905	7434		1969
213	c	FEATHERSTONE-DILKE LAND BH44	3885	7447		1969
214	c	FEATHERSTONE-DILKE LAND BH45	3933	7467		1969
215	c	FEATHERSTONE-DILKE LAND BH46	3957	7455		1969
216	c	FEATHERSTONE-DILKE LAND BH47	3959	7480		1969
217	c	FEATHERSTONE-DILKE LAND BH48	3974	7467		1969
218	c	FEATHERSTONE-DILKE LAND BH49	3985	7459		1969
219	c	FEATHERSTONE-DILKE LAND BH50	3966	7447		1969
220	c	CHURCH FARM RYTON WARKS BH17	3794	7499		1969
221	c	CHURCH FARM RYTON WARKS BH18	3785	7499		1969
222	c	CHURCH FARM RYTON WARKS BH23	3806	7465		1969
223	c	CHURCH FARM RYTON WARKS BH24	3814	7465		1969
224	c	CHURCH FARM RYTON WARKS BH25	3816	7458		1969
225	c	CHURCH FARM RYTON WARKS BH26	3821	7456		1969
226	c	CHURCH FARM RYTON WARKS BH27	3826	7462		1969
227	c	CHURCH FARM RYTON WARKS BH28	3821	7465		1969
228	c	CHURCH FARM RYTON WARKS BH29	3786	7484		1969
229	c	CHURCH FARM RYTON WARKS BH30	3803	7481		1969
230	c	CHURCH FARM RYTON WARKS BH31	3825	7472		1969

BOREHOLE REF.NO. SP37SE		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
231	c	CHURCH FARM RYTON WARKS BH32	3841	7464		1969
232	c	CHURCH FARM RYTON WARKS BH33	3843	7475		1969
233	c	CHURCH FARM RYTON WARKS BH34	3803	7489		1969
234	c	CHURCH FARM RYTON WARKS BH35	3822	7490		1969
235	c	CHURCH FARM RYTON WARKS BH38	3806	7499		1969
236	c	DUKE ESTATE RYTON WARKS BH1	3816	7487		1964
237	c	DUKE ESTATE RYTON WARKS BH2	3814	7485		1964
238	c	DUKE ESTATE RYTON WARKS BH3	3813	7482		1964
239	c	DUKE ESTATE RYTON WARKS BH4	3812	7477		1964
240	c	DUKE ESTATE RYTON WARKS BH7	3808	7482		1964
241	c	DUKE ESTATE RYTON WARKS BH8	3806	7478		1964
242	c	DUKE ESTATE RYTON WARKS BH9	3808	7492		1964
243	c	DUKE ESTATE RYTON WARKS BH10	3806	7487		1964
244	c	DUKE ESTATE RYTON WARKS BH11	3805	7485		1964
245	c	DUKE ESTATE RYTON WARKS BH12	3804	7482		1964
246	c	DUKE ESTATE RYTON WARKS BH13	3801	7485		1964
247	c	DUKE ESTATE RYTON WARKS BH14	3805	7495		1964
248	c	DUKE ESTATE RYTON WARKS BH15	3804	7492		1964
249	c	DUKE ESTATE RYTON WARKS BH16	3803	7488		1964
250	c	DUKE ESTATE RYTON WARKS BH17	3802	7494		1964
251	c	DUKE ESTATE RYTON WARKS BH18	3801	7491		1964
252	c	DUKE ESTATE RYTON WARKS BH19	3798	7497		1964
253	c	DUKE ESTATE RYTON WARKS BH20	3797	7493		1964
254	c	DUKE ESTATE RYTON WARKS BH21	3797	7489		1964
256	c	DUKE ESTATE RYTON WARKS BH23	3793	7493		1964
257	c	DUKE ESTATE RYTON WARKS BH25	3789	7493		1964
258	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH27	3762	7433		----
259	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH28	3754	7429		----
260	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH29	3744	7426		----
261	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH30	3747	7418		----
262	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH31	3751	7424		----
263	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH32	3756	7422		----
264	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH33	3764	7425		----
265	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH34	3733	7423		----
266	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH35	3731	7427		----
267	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH36	3728	7435		----
268	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH37	3725	7428		----
269	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH38	3722	7435		----
270	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH39	3738	7406		----
271	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH40	3742	7393		----
272	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH41	3735	7397		----
273	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH42	3736	7414		----
274	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH43	3741	7422		----
275	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH44	3749	7437		----
276	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH45	3742	7437		----
277	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH46	3733	7435		----
278	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH47	3738	7425		----
279	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH53	3753	7434		----
280	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH54	3744	7432		----
281	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH55	3735	7429		----
282	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH56	3761	7436		----
283	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH57	3758	7427		----
284	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH58	3729	7397		----
285	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH59	3733	7406		----
286	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH60	3728	7416		----
287	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH75	3736	7413		----
288	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH76	3735	7408		----
289	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH77	3725	7410		----

BOREHOLE REF.NO. SP37SE		BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
290	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH78	3718	7409		----
291	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH79	3709	7410		----
292	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH80	3698	7397		----
293	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH81	3717	7394		----
294	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH82	3710	7434		----
295	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH83	3699	7433		----
296	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH84	3720	7427		----
297	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH85	3712	7425		----
298	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH86	3703	7423		----
299	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH87	3723	7417		----
300	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH88	3723	7417		----
301	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH89	3714	7415		----
302	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH90	3720	7454		----
303	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH91	3709	7453		----
304	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH92	3709	7444		----
305	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH93	3718	7443		----
306	c	WARWICKSHIRE C.C. WESTERN PROPERTY BH94	3716	7448		----
307	c	WARWICKSHIRE C.C. WESTERN PROPERTY BHP4	3746	7433		----
308		IGS BURNTHURST FARM PRINCETHORPE WARKS	3880	7158	20.00	1979
309	c	N.C.B.WESTONFIELDS BH WARKS	3632	7153	1162.82	1980
310	c	N.C.B.BURNTHURST BH WARKS	3919	7170	488.00	1980
311		IMAU SOUTH OF CONEY GREY FARM CY44	3725	7392	3.80	1980
312		IMAU EAST OF BUBBENHALL BRIDGE CY52	3569	7279	3.40	1980
313		IMAU BUBBENHALL CY53	3659	7223	4.70	1980
314		IMAU RYTON WOOD CY54	3824	7235	16.70	1980
315		IMAU RYTON HEATH FARM CY54	3911	7287	21.50	1980
316		IMAU STRETTON HOUSE CY55	3999	7224	11.00	1980
317		IMAU BUBBENHALL HOUSE CY59	3731	7165	12.50	1980
318		IMAU BURNTHURST FARM CY60	3838	7113	19.50	1980
319		IMAU STRETTON LODGE FARM CY61	3922	7199	19.00	1980
320		IMAU EAST OF WESTON WOOD CY69	3613	7005	6.50	1980
321		IMAU WAPPENBURY WOOD CY71	3794	7093	17.50	1980
322		IMAU WESTONFIELDS FARM CY70	3647	7068	3.00	1980
323		IMAU FOSS WAY CY72	3988	7026	25.00	1980
324		IMAU BUBBENHALL DR 1	35792	72782	2.80	1981
325		IMAU BUBBENHALL DR 2	35842	72668	3.70	1981
326		IMAU BUBBENHALL DR 3	35768	72695	3.70	1981
327		IMAU BUBBENHALL DR 4	35834	72621	3.10	1981
328		IMAU BUBBENHALL DR 5	35807	72750	3.00	1981
329		IMAU BUBBENHALL DR 6	35872	72851	1.90	1981
330		IMAU BUBBENHALL DR 7	35876	72812	3.70	1981
331		IMAU BUBBENHALL DR 8	35904	72975	3.70	1981
332		IMAU BUBBENHALL DR 9	35551	72688	2.00	1981
333		A445/B4029 1	3901	7422	5.00	1974
334		A445/B4029 2	3902	7424	5.00	1974
335		A445/B4029 3	3903	7426	3.50	1974
336		A445/B4029 4	3882	7455	3.80	1974
337		RYTON ON DUNSMORE SUBWAY 1	3858	7444	4.27	1962
338		RYTON ON DUNSMORE SUBWAY 2	3859	7447	3.35	1962
339		BAGINGTON.BL,CARS LTD. 1	3613	7490	10.00	1978
340		BAGINGTON.BL,CARS LTD. 2	3610	7477	6.10	1978
341		BAGINGTON.BL,CARS LTD. 3	3623	7473	5.00	1978
342		BAGINGTON.BL,CARS LTD. 4	3628	7486	8.00	1978
343		BAGINGTON.BL,CARS LTD. 5	3631	7499	5.00	1978
344		BAGINGTON.BL,CARS LTD. 12	3603	7471	8.50	1978

BOREHOLE REF.NO. SP37SE	BOREHOLE NAME	GRID REF. EAST	NORTH	DEPTH (m)	DATE
345	BAGINGTON.BL,CARS LTD. 9	3619	7499	10.00	1978
346	BAGINGTON.BL,CARS LTD. 10	3617	7499	5.50	1978
347	RYTON ON DUNSMORE TRIAL PIT 1	3771	7443	0.45	1987
348	RYTON ON DUNSMORE TRIAL PIT 2	3770	7442	1.20	1987
349	RYTON ON DUNSMORE TRIAL PIT 3	3775	7451	0.50	1987
350	RYTON ON DUNSMORE TRIAL PIT 4	3770	7450	1.25	1987

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 to a third party by permission of the original client.