EXCURSION REPORT

THE PLEISTOCENE DEPOSITS OF SOUTH LEICESTERSHIRE / NORTH WARWICKSHIRE

Leader: R.J. Rice Sunday, 27th September, 1981

A party of some 25 members was met by the excursion leader at Leicester. It was explained that the primary objective of the day's excursion was to examine the stratigraphy and lithological character of the thick sequence of Pleistocene sediments that underlie the watershed between the Avon and Soar catchments in south Leicestershire and north Warwickshire. As Shotton orginally argued nearly thirty years ago, the present-day drainage system dates only from the withdrawal of the last ice sheet to cover the East Midlands. Prior to that, much of the area now drained by the Avon formed part of the catchment of a northeastward-flowing "proto–Soar river" (Shotton 1953).

The earliest extensive deposit now preserved beneath the modern watershed (text-fig.1.) is the Baginton–Lillington Gravel and the Baginton Sand. This water-laid sequence is interpreted as the product of sedimentation by the proto-Soar river. It is normally succeeded by the Thrussington Till, a reddish diamict of northern or northwestern derivation. The glacial advance responsible for this ice-deposited material apparently reached a line some distance south of Coventry. It was a subsequent withdrawal of the ice front that permitted pro-glacial Lake Harrison to develop very widely across northeastern Warwickshire and adjacent parts of Leicestershire. The Bosworth Clays and Silts that accumulated in this ponded water exhibit local prominent lamination and occasional iceberg-rafted drop-stones. A further alteration in environmental conditions is attested by an upward change into the Wolston Sand and Gravel. This widespread stratum displays an upward coarsening at many individual sites and a regional pattern of increasing fineness towards the southwest. It is interpreted as a sandur (Douglas 1980) laid down by meltwater flowing from an ice front located over central Leicestershire. Thereafter the ice readvanced and laid down the Oadby Till, a very extensive deposit that contains substantial quantities of debris from northwesterly sources, notably chalk, flint, oolitic limestone and Lias limestone.

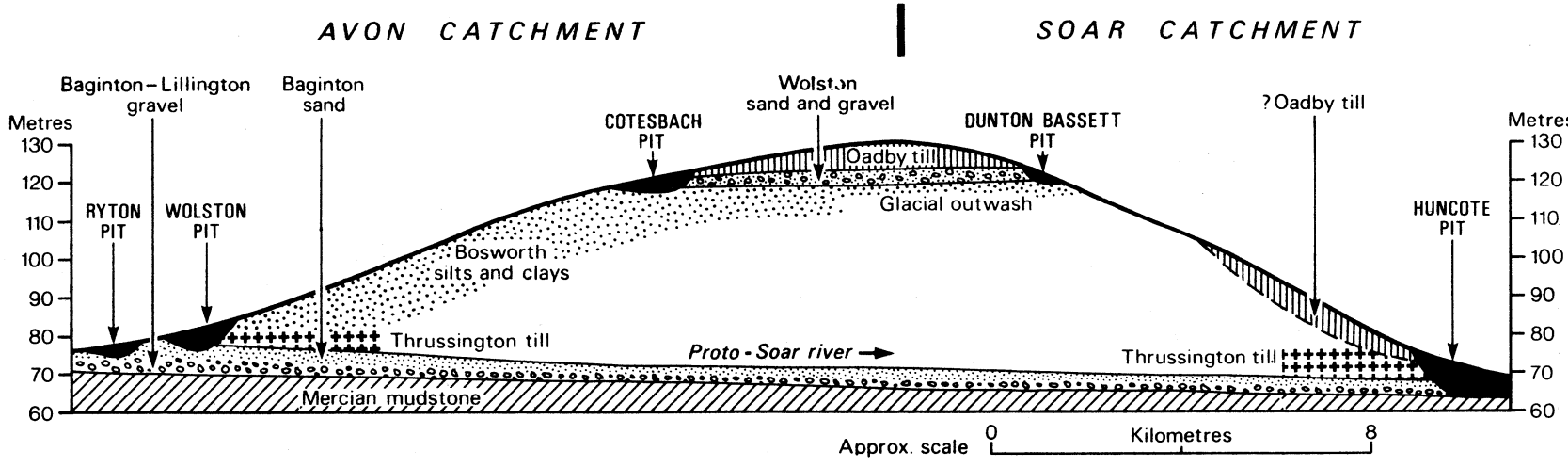
It was decided to start the excursion at the most southerly site to be visited and progressively work northwards across the watershed. To this end the initial journey was along the M69 to Coventry. Today there is very little to be seen in the motorway cuttings, but whilst the engineering work was in progress a number of valuable sections, augmented by borehole evidence, cast additional light on the local stratigraphy (Shotton 1976, Rice 1981a). Five sand and gravel pits were then visited.

1. **The Ryton pit** (SP 387736)

The above grid reference indicates the position of one of the operating faces of a series of pits where, for several decades, Blue Circle Aggregates Ltd., have worked the Baginton-Lillington gravel and the Baginton sand. At the time of the excursion up to 4m of reddish, crossbedded sand was well exposed, but there was no clean face in the underlying gravel. However, it was evident from some of the flooded workings that the gravel rests directly on a bedrock of Mercia Mudstone, and that it is composed almost entirely of pebbles possibly of one the pebble beds of the Sherwood Sandstone Group. The provenance of such material poses a problem since there are no obvious pebble bed outcrops from which the stones could have been derived, and the most likely local source appears to be an earlier till sheet of which only very sporadic traces have ever been found (the Bubbenhall Clay of Shotton 1953). Two aspects of the sand drew comment. The very clear current–bedding should permit an assessment of the water-flow direction at the time of accumulation. It may not satisfy the scientific purist, but there was virtual unanimity among the party that, on the face then visible, the flow appeared to have been towards the northeast i.e. in the opposite direction to the modern Avon and in conformity with the concept of a proto-Soar river. A number of vertical structures transgressing the current –bedding were noted. Some of these appeared to be little more than minor contraction cracks that had filled with sand, but at least one, by virtue of its width and association with deformed bedding, merited recognition as an ice-wedge cast. However, since there was no later sediment across the top of the wedge it was impossible to be sure when it was formed.

2. **The Wolston pit** (SP 410748)

One reason for visiting this abandoned pit, which is the type section for the Wolstonian stage of the British Pleistocene (Mitchell *et al.* 1973), was to demonstrate that mere designation as a Site of Special Scientific Interest is no guarantee of a well preserved exposure! Heavy rain prior to the excursion had caused serious slumping of the small residual face left by extensive tipping of waste. However, it did prove possible to recover samples of both the Thrussington Till and the Bosworth



Text-fig. 1: A sketch section through the main Avon–Soar watershed, indicating the relative positions of the five sand and gravel pits visited in the course of the excursion

Clays and Silts that here overlie the Baginton Sand, and thus to offer an opportunity for comparing these two sediments that can prove difficult to separate where exposures are poor.

Following the visit to the Wolston pit, lunch was taken in the village of Brinklow.

3. **Cotesbach sand and gravel pit** (SP 525820)

This first stop after lunch was still on the southern slopes of the Avon–Soar watershed. The Cotesbach pit of Steetley Construction Materials Ltd. displays the Wolston Sand and Gravel, up to 4.5m thick, resting on Bosworth Clays and Silts and capped by the Oadby Till. At the time of the visit the clays and silts were seen to be clearly laminated, the most obvious difference from those earlier examined at Wolston being their grey rather than reddish brown colour. This appears to reflect an input of fine Liassic detritus that proportionately increases both upwards in the succession and eastwards in the regional distribution. The gravel was similarly noted as having a very different composition from the Baginton–Lillington Gravel seen earlier at Ryton. It was soon discovered that, in addition to flint and oolitic limestone, fossils derived from various lower Jurassic beds are easily collected!

Owing to wet conditions underfoot, access to the main working face was difficult but at least one large ice–wedge cast extending to the top of the gravel was observed. This confirmed the report of cryoturbation at the same stratigraphic horizon during construction of the M1 (Poole *et al.* 1968) and updates the statement by Rice (1981b) that no periglacial fetures have yet been seen at Cotesbach. One further aspect of the face that drew comment was the gentle but obvious cambering of the sand and gravel towards the nearby valley.

4. **Dunton Bassett sand and gravel pit** (SP 541901)

This abandoned pit, formerly worked by Bruntingthorpe Gravels Ltd, was the first site visited within the Soar catchment. The sand and gravel is a northward continuation of that examined at Cotesbach and the major difference between the two locations is the large–scale glaciotectonic folding and faulting that affects the material at Dunton Bassett. The main face is now so degraded that it was chosen with some hesitation for the present excursion. However, the leader was greatly reassured by the way the members of the party still managed to identify for themselves the dominant structures. The face has been described and illustrated in a recent publication (Rice 1981a)and further elaboration here is unnecessary. It will suffice to note that, after accumulation of the sandur represented by the Wolston Sand and Gravel, the southward readvance of the ice caused severe disruption of all the earlier sediments over a broad zone of south Leicestershire; the Dunton Bassett pit is simply the most dramatic demonstration of this fact.

5. **Huncote sand and gravel pit** (SP 514982)

The final pit to be visited, currently worked by Acresford Sand and Gravel Ltd, offered the opportunity to compare the Baginton–Lillington Gravel and Baginton Sand as exposed in the Soar catchment with the corresponding sediments seen earlier in the day at Ryton. Even the brief examination allowed by the time schedule served to confirm significant likenesses in terms of overall succession, composition and sedimentary structures. However, it was the overburden of the sand that attracted most attention from the party. This overburden was seen to consist of a thin reddish till at the base, followed by a much thicker suite of grey chalky tills. Detailed sketches of earlier faces have already been published (Rice 1981a and c), but at the time of the visit a striking new exposure was visible. This showed the chalky material to consist of at least half a dozen layers of greyish till, varying in thickness from less than half a metre to over two metres, and differing in appearance mainly by slight colour variations but possibly also in stoniness. There were no obvious contrasts in the derivation of the erratics, and apart from some thin sandy partings, nothing but till throughout most of the sequence. Discussion centred on whether such a till series could be produced sub–glacially rather than in an ice–marginal position by the superimposition of flow–tills. In a small isolated face a further noteworthy aspect of the overburden was seen since intricate folding of the layered chalky tills had undoubtedly inverted part of the succession. This again suggests that advance of the ice responsible for the Oadby till caused very widespread disruption of earlier sediments.

On the return to the coach, thanks were conveyed to Dr. Rice for his leadership of the excursion. He would now like to take this opportunity of thanking the members of the party for their support, and also of expressing his gratitude to the

various owners for granting access to the pits.

References

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