

EXCURSION

Traverse across the "Lower Lias" south-east of Newark, Nottinghamshire

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28th October 1990

Most of the data required for the compilation of lithological sequences and BGS geological maps in lowland Britain comes not from the study of well exposed rock sections, or borehole and mining information, but from an appreciation of the disposition of surface landforms and associated soil types, i.e. from a study of the geomorphology. By walking a west to east traverse over ploughed land across much of the outcrop of "Lower and Middle Lias" rocks from near Claypole to Caythorpe, east of Newark, it was proposed to demonstrate, or at least get a flavour of the following:

- i. the nature and detailed lithostratigraphy of the "Lower and Middle Lias" rocks as recently revised for the ground east of Nottingham (Brandon *et al.*, 1990; see also Sumbler, herein).
- ii. that very detailed geological maps can be made in an area with little or no exposure by studying the disposition of low relief landforms (features or cuestas) here formed by gently inclined limestones and rare sandstones within the softer "Lower Lias" mudstones. By augmenting the data with evidence from ditch dredgings, the method allows a three-dimensional model of the surface rocks, including dip directions, dip values and the nature and position of faults, to be established with a high degree of confidence.
- iii. that by collecting fossils from the brash of the harder rocks on dip-slopes and from ditch dredgings a reliable biostratigraphy can be added to the lithostratigraphical framework.

In addition, it was intended to demonstrate the existence of an abandoned river course at Fulbeck dating from the last interglacial period.

The party of about 30 people, mostly arriving by coach from Nottingham, assembled at Oyster Lane (SK 8568 4976), Claypole at around 11.00 hrs. The day was fine, but there was a biting cold wind blowing across the Lias plain. After an introductory briefing in the coach the party set off across the fields on an easterly traverse (see Fig. 1). We first walked across the low features formed by three limestones in the Granby Member, namely the Claypole, Blackmires and Fen Farm limestones. The beds are much affected by a series of reverse ENE-WSW faults hereabouts (SK 86 49) and the offset and repetition of the features was demonstrated. Many fossils were collected loose on the dip-slopes of the three Granby limestones, including the rare colonial coral *Septastraea* from the Claypole Limestones (SK 8576 4950). The party then climbed a fairly steep bench-like feature produced by the Dry Doddington Nodule Bed and adjacent limestones in the Beckingham Member. The nodules are composed of grey, ochreous-yellow weathering, clayey limestone and

are commonly crowded with small *Modiolus*. Just below the crest of the feature produced by the Stubton Limestones at the base of the Foston Member, small phosphate nodules were found weathered out from the mudstone. This is apparently the lowest bed of such phosphate nodules in the local sequence, though they become characteristic of the mudstones of the overlying Foston Member. Numerous fossils, especially *Gryphaea* and other bivalves, were collected from the extensive dip-slope of the overlying ferruginous Stubton Limestones, from immediately north (SK 876 498) of the village of Stubton. Proceeding eastwards, the party briefly saw brash of the Lodge Farm Limestone, collected numerous ammonites from ditch-dredged blocks of the Fenton Limestone (SK 884 497) and crossed the features of the Littlegate and Mill Lane Limestones.

The morning traverse finished near Stubton Gorse Farm (SK 890 497). Here, next to a pond dug through old river gravels, was displayed a huge block of typical sandy Mill Lane Limestone, full of *Chondrites* burrows, *Pseudopecten* and *Gryphaea*. This had been dug from the bottom of the pond. There was also a large block of Littlegate Limestone containing abundant beautifully preserved arnioceratid ammonities. The party was treated to a display of mammalian bones and teeth, including those of hippopotamus, the extinct straight-tusked elephant, the extinct narrow-nosed rhinoceros and bison or aurochs. This assemblage of bones was recovered from the gravels at the pond by the local farmer and is typical of the larger mammalian herbivore fauna that lived in Britain during the Ipswichian, or last interglacial period about 125,000 years ago, when the climate was not much different from that of today. The mammalian locality is one of several in the area where gravels of a now abandoned Ipswichian course of the River Witham have been dug. In a wider context, their discovery has enabled the chronology of the nearby River Trent terraces to be revised (Brandon and Sumbler, 1989). The party then adjourned for lunch to a pub at Caythorpe where the leaders readily accepted the offer of a round of drinks from committee members.

In view of the short daylight hours it was decided that the higher beds of the Foston Member at the top of the Scunthorpe Mudstone Formation should be omitted from the afternoon itinerary and the party commenced the afternoon by visiting the isolated 'type locality', near Hougham (SK 8872 4500) (Fig. 1, locality A), of the Glebe Farm Bed, which lies at the base of the Brant Mudstone Formation. The bed represents a renewal of deposition following a period of non-deposition and erosion. It contains numerous burrowed and reworked limestone and phosphate nodules derived from the underlying beds. Amongst the many fossils collected was the ammonite *Gagaticeras*, indicative of the *Oxynoticeras oxynotum* Zone. The eastwards traverse was then resumed along Sand Beck (from SK 8974 4851), west of the village of Brandon. Here numerous sideritic ironstone nodules from the Sand Beck Nodule Bed, the next higher unit in stratigraphical sequence, were examined from ditch dredgings and the ammonite *Gagaticeras* collected. Proceeding eastwards, the party crossed the broad feature formed by the Brandon

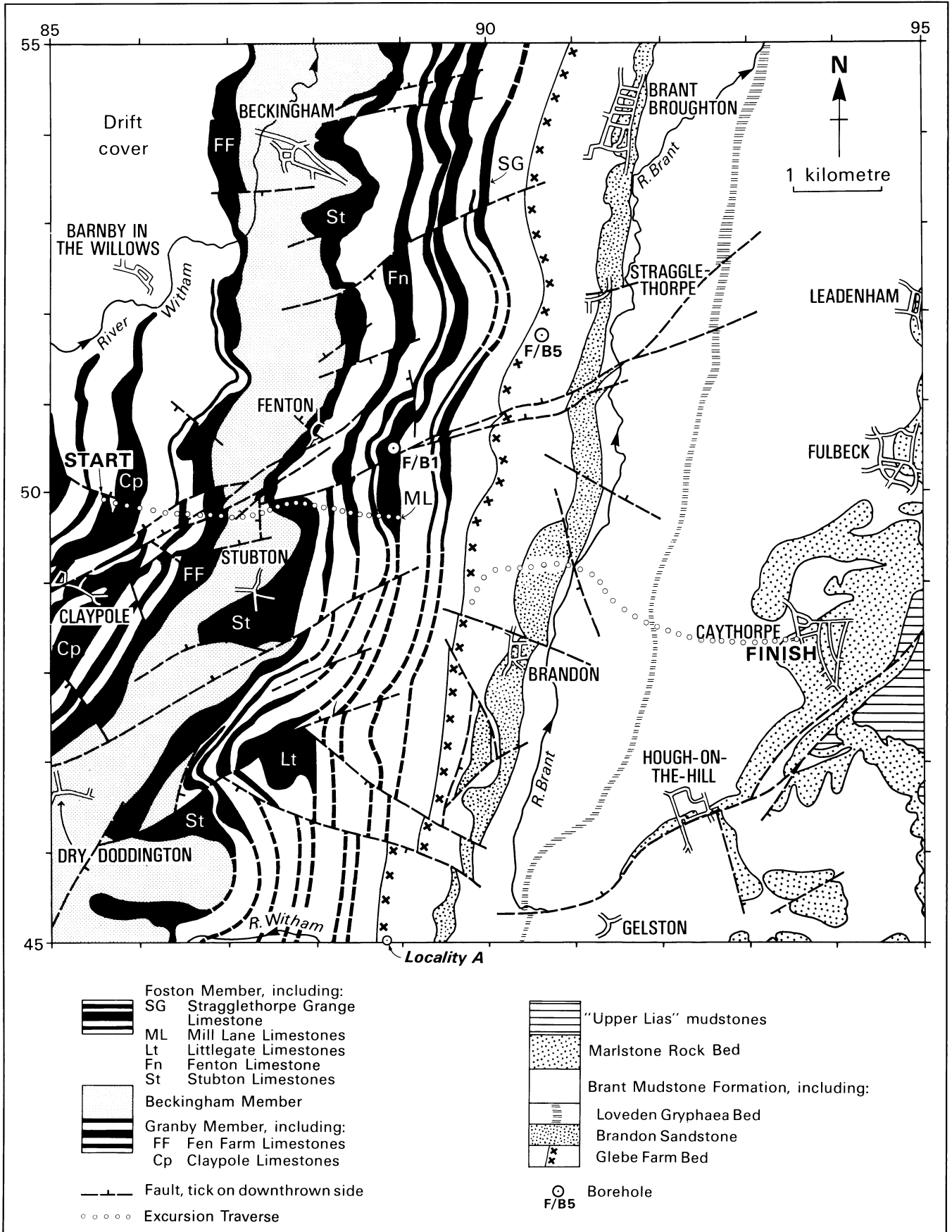


Fig. 1. Simplified geology of the Fulbeck area (from four BGS 1:10 000 geological maps by Brandon and Sumbler). Selected boreholes and faults are shown. The west to east traverse is indicated as well as locality A, the 'type locality' of the Glebe Farm Bed. Modified after Brandon *et al.* (1990) by permission of the Yorkshire Geological Society.

Sandstone or "Sandrock" and collected ammonites and other fossils from dredged blocks of typical calcareous sandstone along the River Brant (SK 9107 4920), north of Brandon. Of particular interest was a spiral burrow-fill, later to be identified by Dr Pemberton as *Gyrolites*, a trace fossil thought to have been formed by a crab-like creature.

Appreciation of the nodular beds higher in the Brant Mudstone sequence was spoiled by the rapidly failing daylight and, possibly, increasing tiredness. There followed a brisk climb along Wheatgrass Lane, up to the rising escarpment slope capped by the Marlstone Rock Bed, to a welcome rendezvous with the coach at Caythorpe (SK 9360 4835) at about 16.00 hrs.

Acknowledgements

The leaders would like to thank several farmers along the route, especially Mr D. Burt of Stubton, for allowing free access to their ploughed land. They also express their gratitude to the officers of the Society for their kindness in subsequently laying on a superb Chinese meal.

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References

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