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THE ALLUVIAL FRINGES OF THE SOMERSET LEVELS: PRELIMINARY RESEARCH RESULTS

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Introduction

The Somerset Levels have been the focus of archaeological and palaeo-ecological interest since the end of the previous century. However, most of this research has concentrated on the central raised bog area, while far less is known about the alluvial fringes and the fluvial characteristics of the precursors of the present-day rivers, in particular the River Brue.

A current PhD research project at the University of Exeter is attempting to fill this gap in the knowledge of the region. The work focuses on two fieldwork areas which, in combination with data from existing literature, will lead to a reconstruction of the fluvial history of the river Brue. This papers describes some of the early results and preliminary conclusions.

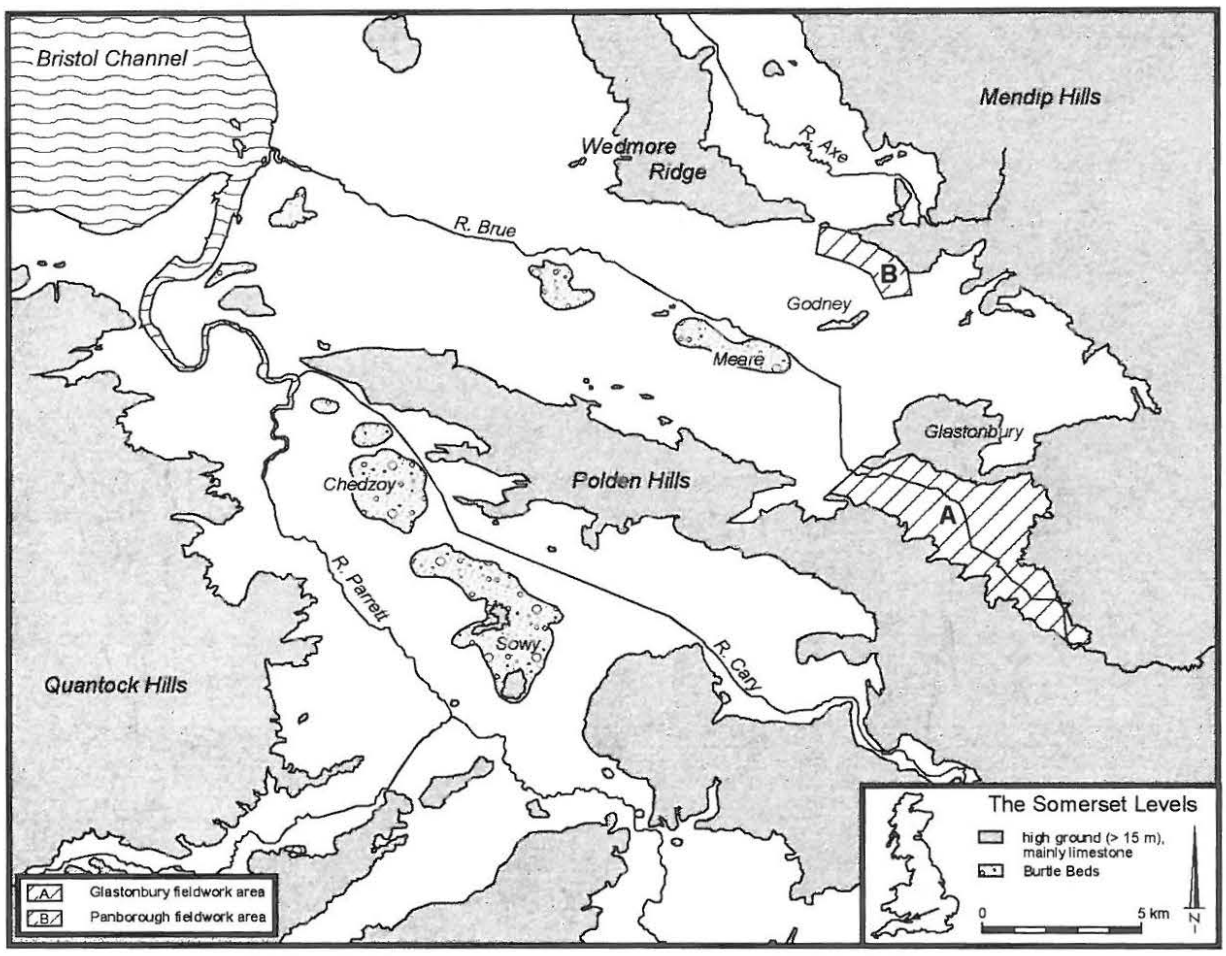

Figure 1: Map of the Somerset Levels showing the location of the fieldwork areas.

Outline of Holocene landscape development

The earliest Holocene deposition in the Somerset Levels was dominated by the rapidly rising sea level, leading to the deposition of a thick layer of clastic sediments (Kidson & Heyworth 1976, fig.7) which effectively fills in the deep valleys in the pre-Holocene surface. This clastic sedimentation was not a continuous process as is shown by the presence of peaty layers within the sands and clays (Godwin 1943, fig.12; Kidson & Heyworth 1976, fig.7). Although generally known as the Blue Estuarine Clay, observations on the top of these deposits show that they were deposited in a saltmarsh environment. The boundary between these clays and the overlying fenpeat has been radiocarbon dated to between 5650 ± 70 BP (HAR-1831) and 5020 ± 80 BP (HAR-5354; Coles & Dobson 1989).

Although earlier pollen diagrams from the region are available (Godwin 1941, fig.5-8), one of the first generalised stratigraphic cross sections through the Somerset Levels was published by Godwin (1943, fig.12), extending from the raised bogs in the east to the Bristol Channel in the west. It shows the ombrogenous deposits overlying the thick layer of estuarine clays. Towards the west, the ombrogenous peats laterally continue as fen and carr peat deposits. The peats in the western, coastal, part of the Levels, adjacent to major rivers, and between Godney and Wedmore Ridge, are overlain by a second clay layer (Godwin 1943, fig.12, fig.13; Godwin 1955, fig.2; Kidson & Heyworth 1976) originally known as the 'Roman Clay' (Godwin 1955, fig.2).

In the stratigraphy of several pollen diagrams evidence for flooding episodes is recorded, both in the carr peats and in the raised bog peats. In the Newlands Rhyne diagram (Godwin 1943, fig.13) a thin clay layer within the carr peat was found. More commonly, layers of *Cladium* rich fen peat or hypnoid moss peat are found in the raised bog (Clapham & Godwin 1948, fig.7, fig.8, p.257, p.264; Housley 1995, fig.5.6) showing that these flooding episodes were severe enough to temporarily disrupt raised bog growth. At least two major phases of flooding are recognised (Godwin 1960, fig.15), but later peat cutting may have removed evidence for further flooding.

Housley (1988, 1995) presents the

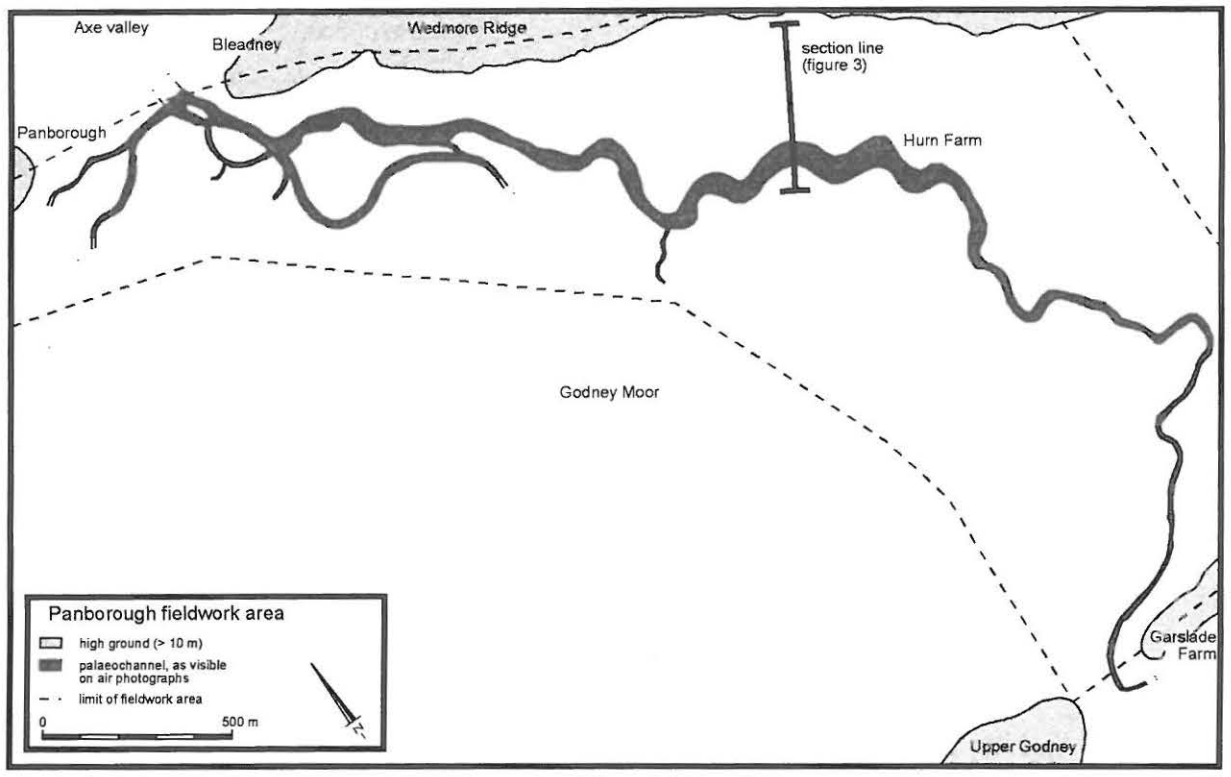

Figure 2: Detail map of the Panborough fieldwork area with the palaeochannel

eastward continuation of the section by Godwin (1943, fig.12). It shows that the raised bog extended as far as the Glastonbury Lake Village, but to the east of this point, the stratigraphy consists mostly of detritus and organic lake deposits (Housley 1995, fig.5.6). More to the north, a wedge of clastic sediments overlies the raised bog peats, separated from it by a thin layer of fen peat (Housley 1995, fig.5.9, fig.5.10). This clastic material extends southwards from Panborough Gap into the Brue Valley towards Godney, with the southernmost edge almost reaching Glastonbury Lake Village (Godwin 1955, fig.2). According to Green & Welch (1965), this clay correlates with similar deposits in the Axe Valley.

Glastonbury fieldwork area

(area A in figure 1)

The deposits underneath the floodplains between Glastonbury, Street and Baltonsborough have not yet been studied in as much detail as the area between Panborough and Godney. The area has been chosen because it appears to be a basin separated from the rest of the Somerset Levels by a rock threshold between Glastonbury and Street. The height of this threshold appears to be between *c.*0.0 m OD and 3.0 m OD (Kidson & Heyworth 1976, fig.9). This would give the opportunity to interpret the sedimentary sequence as being purely fluvial without any marine influences.

From the available data it is clear that the main part of the stratigraphy in area A consists of detritic deposits and carr peat with varying clay contents. These variations appear to be very localised and usually cannot be traced from core to core. The deposits are comparable to those found by Housley between Glastonbury and Garslade Farm (Housley 1995, fig.5.6), and a correlation seems likely. Occasionally, intercalated sedge peat and thin clay layers are found. Preliminary macrofossil analysis shows that on at least two occasions an oligotrophic vegetation with *Scirpus caespitosus* developed, but so far no raised bog peats containing *Sphagnum* or other typical ombrotrophic species have been found.

In the deepest parts of the valley, for instance on the south side of the floodplain, the carr peat layer is underlain by clays similar to the lower estuarine clays. The top of the clay is found approximately at Ordnance Datum, the same height at which the top of the lower estuarine clays is generally found (Godwin 1943, fig.12; Godwin & Willis 1959; Godwin & Willis 1961; Kidson & Heyworth 1976; Curran 1979). It is likely therefore that these sediments can be correlated with the lower estuarine clays. Work is under way to trace the inland extent of these deposits.

Panborough fieldwork area

(area B in figure 1)

Work in the fieldwork area between Godney and Panborough was specially undertaken because of the presence of a palaeochannel. Although clearly visible on air photographs (McDonnell 1979, fig.3; McDonnell 1985, fig.2) and in the field, and appearing on many maps as 'Old River Brue' (for instance Godwin 1955, fig.1, fig.2), no stratigraphical or palaeo-ecological work has previously been carried out on this feature, though some work has been completed on the alluvial deposits in which it lies (Godwin 1955, fig.14; MacFadyen 1955; Housley 1988, fig.78). Figure 2 shows the palaeochannel as it can be seen on air photographs. It can be traced from the gap between Upper Godney and Garslade Farm going north to Hurn Farm. To this point the channel is fairly narrow, but after bending towards the north-west along Wedmore ridge it widens to over 50 m. Where it approaches Panborough Gap (Godwin 1955), several secondary channels, presumably cut-offs, can be observed. Just before entering the Axe valley, a smaller channel merges from the west. The main palaeochannel cannot be traced further into the Axe valley.

Figure 3 presents a schematical litho-stratigraphic section through the palaeochannel and the adjacent sediments near Hurn Farm. On a substratum formed by pre-Holocene slope deposits in the southern half and by colluvial deposits in the northern half of the section, a sequence of clays and peat layers was deposited. The base is formed by silty clays, which are considered to be the lower estuarine clays, followed by a layer of fine detritus and carr peat of *c.*2.3 m thickness frequently containing Alder wood.

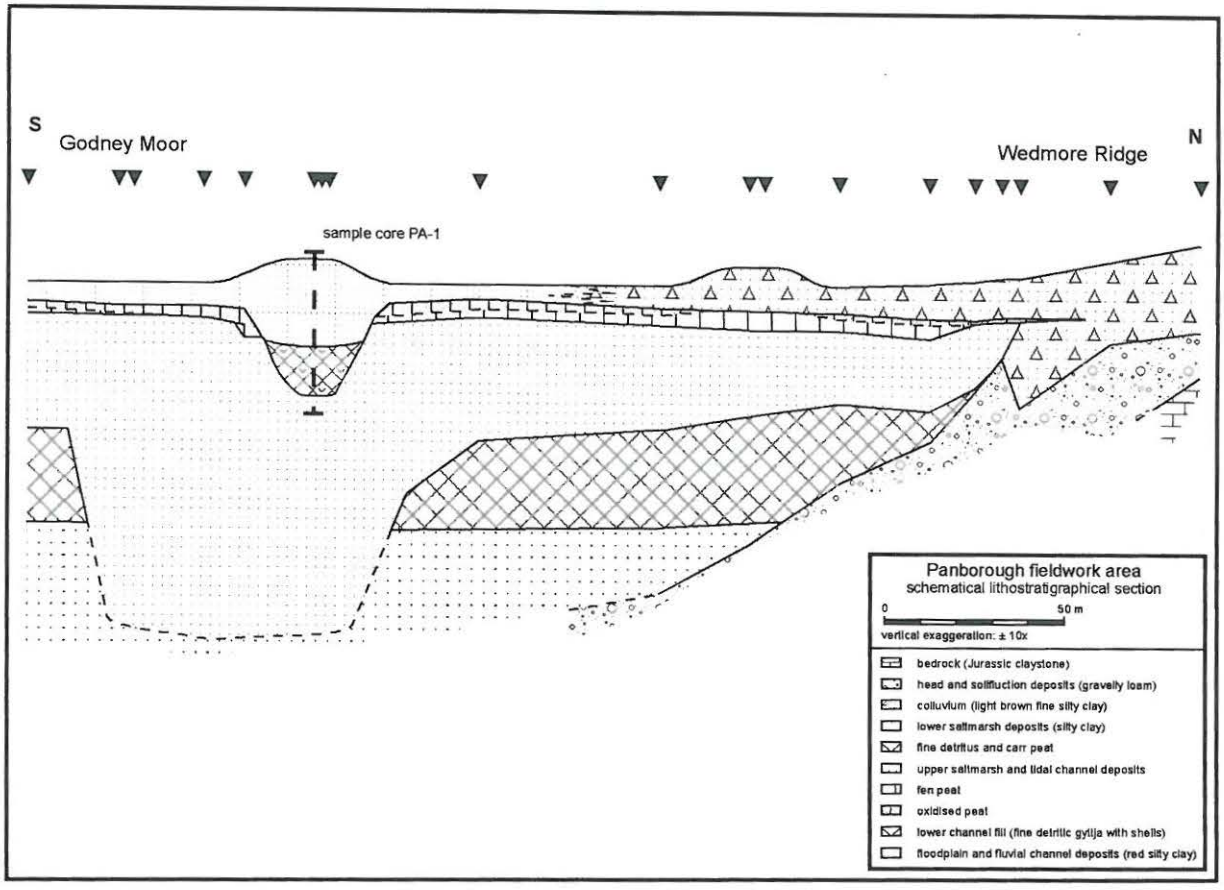

Figure 3: Schematical lithostratigraphic section through the palaeochannel near Hurn Farm

On top of the organic deposits a clay layer of varying thickness is found. North of the palaeochannel, the top of these clays shows signs of initial subaerial soil formation and plant roots occur regularly. To the south of the channel, the sediment is siltier and contains shell fragments, whereas underneath the palaeochannel and in an approximately 50 m wide zone either side of it the clays are strongly silty and show millimeter-scale lamination. The laminated sediments continue downwards to at least 9 m below the surface. The environment in which these clays were deposited is probably a tidal channel with saltmarshes on the northern side of it. Possibly similar saltmarshes existed on the south side as well, but these have not yet been found. This is almost certainly the estuarine 'Roman Clay' described by Godwin (1955, fig.2) and later by Housley (1995). Radiocarbon datings on the top and bottom show that it was deposited between 2860 ± 50 BP (Q-2459) and 2550 ± 50 BP (Q-2458; Housley 1988, fig.78).

A phase of predominantly sedge peat growth followed the deposition of the clays. Exposure to air and medieval peat cutting has however reduced the thickness of the peat layer considerably, and in places only 0.2 m of strongly oxidised peat have been found.

In the tidal channel, which remained open for some time after the marine influence had ended, a layer of fine detritic gyttja with abundant shells was deposited. The nature of this deposit and the observation of planktonic diatoms in some samples (A.G. Brown, pers. comm.) indicates a phase with very little current, standing water or an input of marine water. The channels sequence ends with some 2 m of red silty clay, sometimes with coarse sand and fine gravel, abundant charcoal and shell fragments. The contact with the fine organic deposits below is erosional, indicated by the irregular boundary and small lumps of detritus incorporated in the base of the clays. Further away from the channel the red clay decreases in thickness to *c.*0.5 m and overlies the oxidised fenpeat. On the northern half of the section, the oxidised peat is capped by light brown clays, which are derived from the nearby Wedmore Ridge.

Conclusions

The palaeochannel near Panborough appears to have inherited its course from the underlying tidal channel. The presence of the fine organic infill suggests that a considerable time gap may exist between the end of the marine influence and the deposition of the fluvial red clays. In fact, the deposition of the red clays could well have taken place in or after the medieval period. Williams (1970) mentions the building of a weir near Hurn Farm and the straightening and widening of the channel in 1327 which indicates that it remained a navigable watercourse at that date.

No evidence has been found so far for a river channel in the organic deposits pre-dating the incision of the tidal channel and the deposition of the upper saltmarsh clays and post-dating the lower estuarine clays.

The lack of a high bedrock threshold (0.0 - 3.0 m OD; Kidson & Heyworth 1976, fig.9) between Glastonbury and Street as indicated by the presence of the lower estuarine clays means that the interpretation of the overlying organic deposits in this area becomes slightly more complicated because incursion of seawater remained a possibility after 5500-5000 BP. However, marine influence seems to have been minimal, since the upper estuarine clays have not been recorded south of Glastonbury Lake Village (Godwin 1955, fig.2; Housley 1995, fig.5.9, fig.5.10). The presence of the lower estuarine clays does mean that marine influence prior to 5500-5000 BP extended further eastward than shown on the palaeogeographical maps of Kidson & Heyworth (1976, fig.11a).

Further research

A detailed analysis of the sediments from the Glastonbury fieldwork area will provide a reconstruction of the fluvial development for this area, spanning the entire period between 5500 BP and the Middle Ages. Using biostratigraphical correlations, supported by radiocarbon dating, this development then can be extrapolated to other areas in the Somerset Levels.

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