M. VAN DER VEEN, A.R. HALL AND J. MAY

WOAD AND THE BRITONS PAINTED BLUE

In a now famous passage in *De Bello Gallico* (Book V, 14) Caesar describes the use of body paint by the ancient Britons:

> Of the inlanders [of Britain] most do not sow corn, but live on milk and flesh and clothe themselves in skins. All the Britons, indeed, dye themselves with woad [*vitrum*], which produces a blue colour, and makes their appearance in battle more terrible.

Recently, the use of woad as the blue dye described by Caesar and the translation of *vitrum* as woad was questioned in an article about the colour of Lindow Man (Pyatt *et al.* 1991). In order to test whether the skin of the bog body contained any evidence of having been painted, samples of skin from the third body found at Lindow Bog were examined, using electron probe X-ray micro-analysis. The ionic composition showed that fairly large amounts of aluminium, silica and copper were present. These were interpreted as residues of clay-based copper and other pigments applied to the body (Pyatt *et al.* 1991, 61). This, together with the absence of any Iron Age records of woad from this country, led the authors to suggest that woad might not be the origin of the blue paint to which Caesar referred. The recent discovery of woad at Iron Age Dragonby does, however, alter the picture substantially.

A large part of the Iron Age and Romano-British nucleated settlement at Dragonby, near Scunthorpe, South Humberside (SK 905 138) was excavated by one of us (JM) in advance of threatened ironstone quarrying between 1964 and 1973. Interim reports outline some of the settlement's principal features (May 1970; 1976; 1984; Elsdon and May 1987) while work has progressed on the sizeable task of preparing the final report.

The settlement lies in the territory of the Iron Age tribe of the Corieltauvi. It was undefended and about 10 ha in area. The main features comprised rectilinear enclosures, trackways and round-houses. Large quantities of fine La Tène decorated pottery, metalwork, and other artefacts suggest a rich community which included individuals of high status, contrasting with other small enclosure settlements elsewhere in the tribal territory. Iron Age coins follow a statistical pattern which allows comparison with a number of other major settlements in the region, and whose distribution suggests the possibility that Dragonby could have been the principal settlement of a district or *pagus* (May 1984 and forthcoming). The strati-

OXFORD JOURNAL OF ARCHAEOLOGY 12 (3) 1993

graphy, artefact typology and themoluminescence dating of the pottery show that the site was flourishing in the first centuries BC and AD, and could have begun somewhat earlier.

The remains of woad we report here were found in the lower levels of a waterlogged pit, F 589 layer d. The pit was sub-rectangular in plan (*c.* 4.5 by 3.7 m) and 1.75 m deep below the surface of the windblown sand subsoil. There was no direct evidence as to the purpose of the pit. Layer d contained a large amount of waterlogged plant remains, together with a few sherds of Dragonby's late Iron Age E and G wares (Elsdon and May 1987). The lowest layer of the pit, layer e, contained more late Iron Age G and L wares, a sherd of a white ware flagon and another of a white ware butt beaker. The absence of Roman material of Claudio-Neronian date distinguishes the pit from the (admittedly) small number of deposits at Dragonby positively identified as belonging to the conquest period, and while it does not conclusively rule out a very early Roman date for the pit, there is a much stronger likelihood that the lower levels of the pit were deposited during the late Iron Age before the advent of the Roman army.

Recently, one of us (MvdV) re-analysed the plant remains from Dragonby to prepare a report on the material for publication (Van der Veen forthcoming). Amongst the waterlogged seed assemblage from pit F 589d eighteen fragments of woad (*Isatis tinctoria* L.) were found (identified by ARH). The fragments consist of a rather spongy tissue with some strands running across it. They look like boat-shaped hollows and represent the central part of the fruit which contains the seed. In one fragment parts of the wing of the fruit are still preserved (Fig. 1). As already mentioned above, woad is a dye plant which, together with weld (*Reseda luteola* L.; yellow) and madder (*Rubia tinctoria* L.; red) was an important crop during the Middle Ages. Seeds of weld, *Reseda luteola*, are also present at Dragonby, but not in the same context as the woad. *Reseda lueola* is a common plant of disturbed ground and could belong to the local flora, but may also have been used as a dye plant. Woad is not native to Britain; it originates from south-eastern Europe and represents an introduction into this country.

The process by which the dye is obtained from the leaves involves a complex sequence of fermentation (see, for example, Hurry 1930, 22 ff.). In the medieval period, for example, the leaves were initially pulped and formed into balls which were subjected to a first period of fermentation. The balls were then ground and re-fermented in a 'woad bath', typically with addition of materials such as bran, madder, or even dung, to provide a substrate for the bacteria responsible for the second stage in the fermentation process. Lime was added to maintain an alkaline environment. The bath would have to be kept at *c.* 60°C for perhaps a few days, after which dyeing could take place. The process of dyeing with woad is much more complicated than for almost any other dyestuff and presupposes a considerable degree of control over the dye-bath environment.

The presence of the seed and pod fragments does, of course, only provide circumstantial evidence for the use of the plant, as the parts of the plant used in the manufacture of the blue dye are the leaves, usually when young (Hurry 1930), *i.e.* before the seed has been set. The seeds of fruits would not normally be expected in a deposit of dye-bath waste. That said, at York two deposits (one dated to the Anglo-Scandinavian period, the other to the fourteenth century) have been interpreted as containing remains of woad leaves discarded

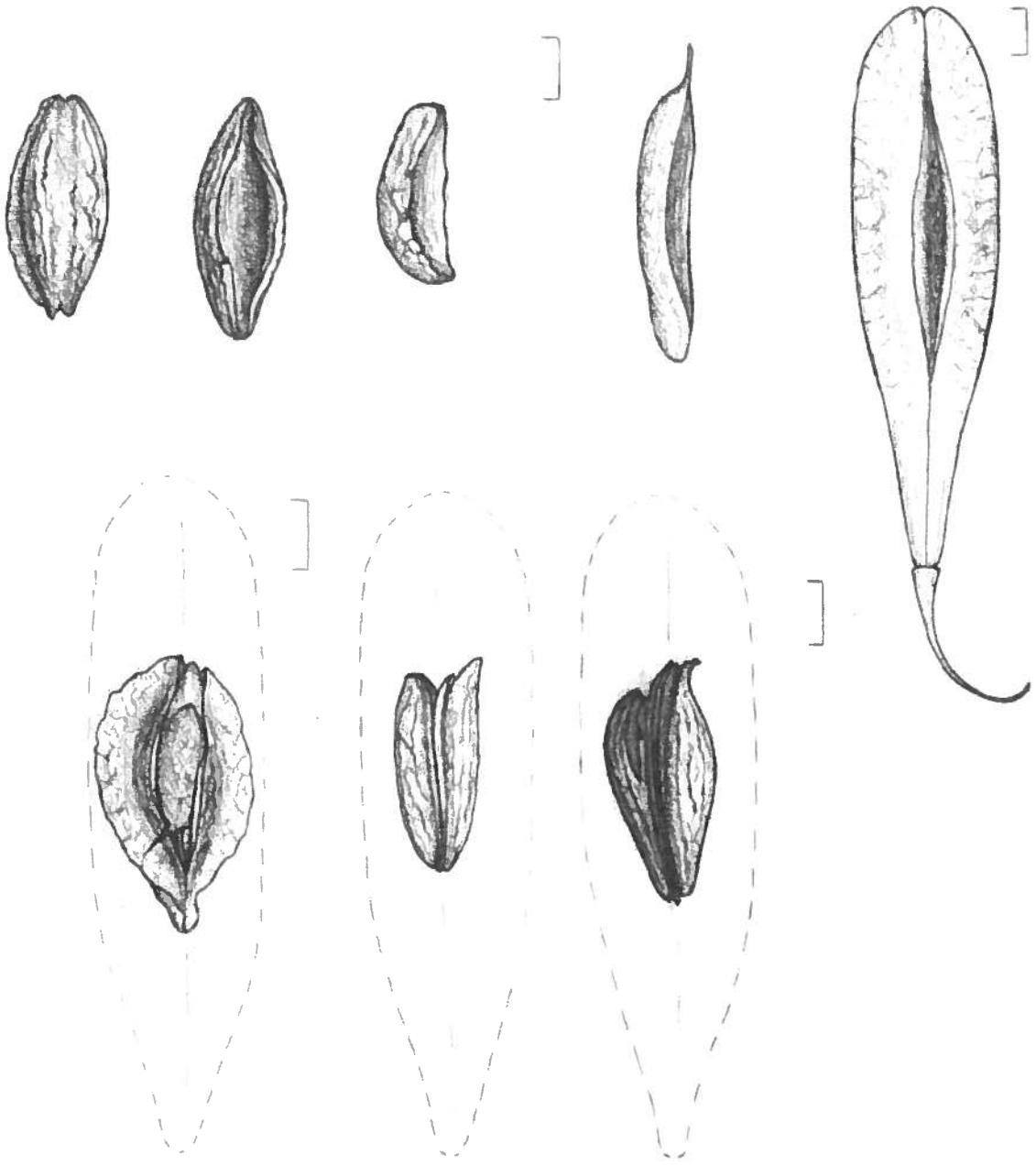

Figure 1
Fossil and modern pods of woad (*Isatis tinctoria* L.). Top left: a whole modern fruit (lateral view). Other specimens are fossils from context F589 layer d at Dragonby. The bottom row shows in outline the shape of the whole pod, the narrow wing having degraded in antiquity. The specimen at bottom right shows a seed in situ within the pod. The length of the scale is in each case 1 mm.

NB – image reversed (top left is here top right, etc.)

from the dye vat (Hall 1992). Both deposits also contained woad seeds and/or pod fragments. Furthermore, woad plants produce large numbers of seeds, and the plant may have spread itself into ruderal habitats around its place of cultivation. The waterlogged assemblage from pit F589d at Dragonby contained the seeds of a variety of ruderal species, which are likely to have entered the pit when it was deliberately back-filled. Finally, as woad represents an introduction into this country, it is likely that it was introduced for a purpose, *i.e.* for its blue dye.

This find of woad at Dragonby is of considerable archaeobotanical importance: it forms the earliest occurrance of this species so far recorded in the British Isles. Jessen and Helbaek (1944) mention a seed impression on pottery from Somersham, Huntingdon, dated to the Anglo-Saxon period, and Kenward and Hall (in prep.) describe woad from the Early Christian (seventh-eight century AD) rath at Deer Park Farms, Co. Antrim, Northern Ireland. There are a further two records of woad from York, dated to ninth-tenth and fourteenth centuries (Hall 1992; Tomlinson 1985). The only other possible record to date is a tantalising reference to 'the actual woad or blue dye which our forefathers used in prehistoric [Iron Age] times . . . found stored up' in two North Staffordshire barrows excavated in the early years of this century (Beresford 1909, 2, quoted by Hurry 1930, 53). Unfortunately, the primary reference merely refers to the excavation of the barrows and to the discovery of the woad, but offers no indication of the nature of the find or whether it was authenticated.

Woad has, of course been found in Iron Age contexts in others parts of Europe, also outside its native habitat. Five seed impressions of woad were found on sherds of the Hallstatt period (sixth and fifth century BC) at the Heuneburg, southern Germany (Körber-Grohne 1987). Fruits and seeds of woad were found at the Roman Iron Age (first and second centuries AD) site of Feddersen Wierde on the north German coast (Körber-Grohne 1967) and from in and around an Iron Age pot at Ginderup, Denmark (Jessen 1933).

While the present authors do not dispute the presence of mineral pigments on the skin of the third body from Lindow Bog, they would argue that this does not rule out the use of woad as a source of blue colour during the late Iron Age. The discovery of woad in Iron Age Dragonby demonstrates that it was definitely available in Britain at the time of the Roman conquest. As a non-native species the presence of woad does suggest that the plant was deliberately imported into Britain, and, therefore, probably cultivated here for the production of the blue dye. Consequently, the debate on the blue body paint of the Britons remains wide open.

Acknowledgements

The re-analysis of the Dragonby plant remains was funded by HBMC. Figure 1 was drawn by Sue Colledge.

(MvdV) *School of Archaeological Studies*
University of Leicester
Leicester LE1 7RH

(ARH) *Environmental Archaeology Unit*
University of York
Heslington, York YO1 5DD

(JM) *Department of Classical and*
Archaeological Studies
University of Nottingham
Nottingham NG7 2RD

BIBLIOGRAPHY

CAESAR: *De Bello Gallico*. The Gallic War. English translation by H.J. Edwards. The Loeb Classical Library, London, Heinemann, 1917.

BERESFORD, W. 1909: *Memorials of Old Staffordshire*. London, George Allen & Sons.

ELSDON, S and MAY, J. 1987: The Iron Age pottery from Dragonby: a draft report. University of Nottingham, Department of Archaeology.

HALL, A.R. 1992: Archaeological records of woad (*Isatis tinctoria* L.) from medieval England and Ireland. In *Beiträge zur Waidtagung*. Arnstadt, Thüringer Chronik-Verlag, 21–22 and figs. 1–2.

HURRY, J.B. 1930: *The Woad Plant and its Dye*. London, Oxford University Press (1973 reprint by Augustus M. Kelley, Clifton, N.J., U.S.A.).

JESSEN, K. 1933: Planterester fra den aeldre Jernalder i Thy. *Botanisker Tidskrift*, 257–288.

JESSEN, K and HELBAEK, H. 1944: Cereals in Great Britain and Ireland in prehistoric and early historic times. *Det Kongelike Danske Videnskabernes Selskab, Biologiske Skrifter* 3, nr. 3, 1–68.

KENWARD, H.K. and HALL, A.R. (in prep.): Plant and invertebrate remains from the Early Christian rath at Deer Park Farms, Co. Antrim. Technical Report to be submitted to DoE N. Ireland.

KÖRBER-GROHNE, U. 1967: *Geobotanische Untersuchungen auf der Feddersen Wierde*. Feddersen Wierde 1 (ed. W. Haarnagel). Wiesbaden, Franz Steiner.

KÖRBER-GROHNE, U. 1987: *Nutzpflanzen in Deutschland. Kulturgeschichte und Biologie*. Stuttgart, Theiss.

MAY, J. 1970: Dragonby: an interim report on excavations of an Iron Age and Romano-British site near Scunthorpe, Lincolnshire, 1964–9. *The Antiquaries Journal* 50, 222–245.

MAY, J. 1976: *Prehistoric Lincolnshire*. Lincoln, History of Lincolnshire Committee.

MAY, J. 1984: The major settlements of the later Iron Age in Lincolnshire. In N. Field and A. White (eds.) *A Prospect of Lincolnshire*, Lincoln, Lincolnshire County Council.

MAY, J. fortcoming: Coinage, settlement and society in the late Iron Age of eastern England. *Actes du XIe Congrès International de Numismatique*. Brussels.

PYATT, F.B., BEAUMONT, E.H., LACY, D., MAGILTON, J.R., and BUCKLAND, P.C. 1991: Non Isatis sed Vitrum or, the colour of Lindow Man. *Oxford Journal of Archaeology* 10, no. 1, 61–73.

TOMLINSON, P. 1985: Use of vegetative remains in the identification of dyeplants from waterlogged ninth-tenth century deposits at York. *Journal of Archaeological Science* 12, 269–283.

VEEN, M. VAN DER forthcoming: The plant macro-fossils. In J. May, The Excavations at Dragonby, South Humberside.