may be estimated that an axe of comparable size and finish to that of the Sweet axe would take 100 hours to produce. Further, the discovery of several jade axes in or near streams or rivers, or in other fluviatile deposits, and the one found actually in a boat, suggest that they were either lost during transport or deliberately consigned to water. The Sweet axe, although clearly associated with cultural remains, was similarly found in a watery situation, with implications of transport in the very existence of the track. Whether lost by accident, or deliberately put beside the track, its discovery supports the interpretation of jade axes as more than mere chopping tools.

Moreover, the association of both the jade axe and the unused flint axe with the Sweet track, and hence with each other, may suggest that axes of all materials were at times removed from the functional sphere. It is important to note, in this context, that despite the quantity of wood preserved in the peat, neither the jadeite nor the flint axe was found with anything remotely resembling a haft, nor was there any trace of binding material, nor of any bag or container. Also, although there is abundant evidence that the wood used in building the track was often cut to shape on the spot, with a stone blade, neither of the axes shows signs of use, and all the authors are agreed that these two axes were unlikely to have been lost or discarded in the building of the track.

Activity of a ceremonial nature is well documented in later neolithic contexts in Britain, and such activity has been suggested from the earliest British Neolithic, on the basis of evidence from causewayed enclosures. This suggestion is now perhaps reinforced by the discovery of the two axes from the Sweet track.

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# Neolithic flax in Bulgaria

*R. W. Dennell, Lecturer in the Department of Ancient History and Prehistory, University of Sheffield, sends us the following note.*

Flax seeds occur sporadically on many neolithic sites in the Near East and Europe. So far, the earliest finds are from Çayönü Tepesi, where seeds of *Linum* cf. *bienne* were recovered from a horizon dated to *c.* 7000 BC (van Zeist, 1972); slightly later finds are reported from Tepe Sabz, *c.* 5500–5000 BC (Helbaek, 1969) and Tell Brak, *c.* 4500 BC (Helbaek, 1960). In Europe, where flax is commonly supposed to have been introduced from Asia Minor (Helbaek, 1960), the earliest find of flax at present is from the Bandkeramik settlement of Heilbronn (Bertsch and Bertsch, 1949). It is, however, curious that flax has not so far been found on any neolithic site in south-east Europe, where it might be expected to occur after the sixth millennium BC. To date, the earliest find from this region is *c.* 3500 BC from a Gumelnitsa context at Kapitan Dimitrievo (Renfrew, 1973).

For this reason, the discovery of flax seeds in neolithic deposits in Bulgaria is of special interest. At the Karanovo I settlements of Chevdar and Kazanluk, dated to *c.* 5500–5000 BC, flax seeds were found by the author among the large quantity of carbonized plant material

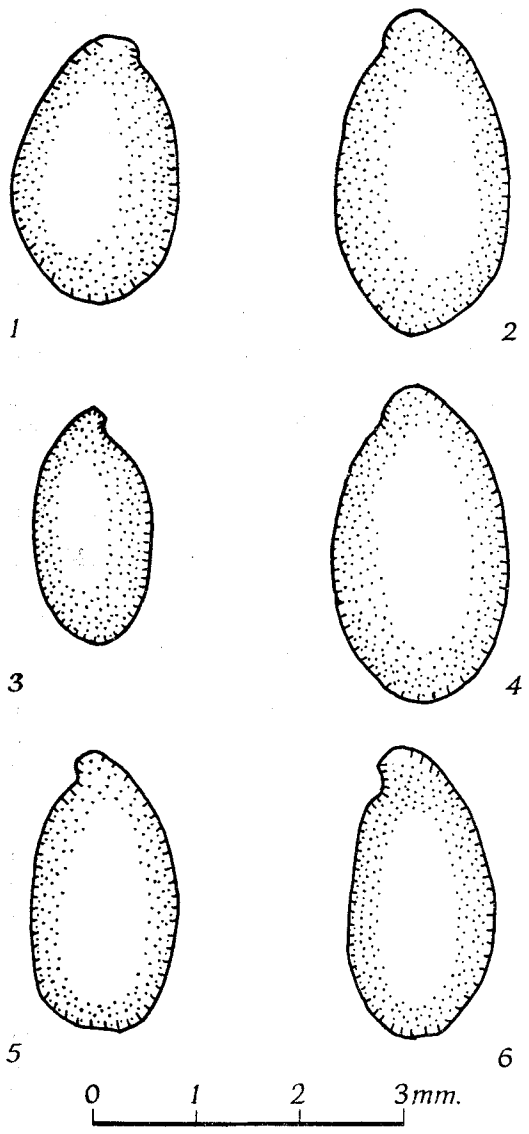


*Fig. 1. 1: modern seed; 2, 4, 6: specimens from Chevdar; 3, 5: specimens from Kazanluk*

recovered during recent excavations. As FIG.1 shows, these seeds have a well-pronounced beak; on some, the hexagonal cell-structure characteristic of flax seeds could be seen. Table 1 shows the size of these seeds, and also of some modern specimens.

If one assumes that the length of these seeds shrank by 13 per cent and the width by 21 per cent on carbonization (van Zeist, 1972), the mean size of the Chevdar specimens would probably have been 3·37 by 1·90 mm., and those from Kazanluk 2·46 by 1·28 mm. These seeds are not unlike those of *L.* cf. *bienne* found at Çayönü Tepesi, and within the size range (allowing for the effects of carbonization) of *L. bienne* as described by Brouwer and Stahlin (1956). They are, however, distinctly smaller than the seeds of *L. usitatissimum*. We could thus identify these specimens as *L.* cf. *bienne*. This identification should, however, be treated with caution, as there are, apart from *L. bienne*, at least fifteen species of *Linum* in Bulgaria today (Tutin *et al.*, 1968).

It is difficult to decide from such slender evidence whether flax was cultivated, gathered, or regarded as a mere weed by the Neolithic inhabitants of Chevdar and Kazanluk. As no sample was found which consisted predominantly of flax seeds, there is no evidence that it was cultivated. At Kazanluk, three of the seeds were found in what was probably the residue left after winnowing wheat, and one in the residue which probably resulted from grain cleaning. Three of the Chevdar seeds were recovered from what has been interpreted as the detritus left after grain cleaning, and one in a sample of emmer from an oven (Dennell, 1972). It thus seems likely that flax grew in wheat crops as a segetal plant, which may have been used for either its fibres or its oil.

We can conclude, therefore, that flax was

**Size of flax seeds from Chevdar and Kazanluk, and modern seeds of *L. bienne***

| | | Length (in millimetres) | | | | Breadth | | | |
|---|---|---|---|---|---|---|---|---|---|
| | No. | min. | average | max. | $s^2$ | min. | average | max. | $s^2$ |
| Chevdar | 5 | 2·80 | 2·98 | 3·03 | — | 1·49 | 1·57 | 1·71 | — |
| Kazanluk | 6 | 1·93 | 2·18 | 2·48 | — | 0·94 | 1·06 | 1·21 | — |
| *L. bienne* (modern) | 25 | 2·58 | 2·69 | 2·71 | 0·89 | 1·54 | 1·65 | 1·77 | 0·64 |

**Table 1**

present in south-east Europe after its earliest occurrence in Asia Minor, but some thousand years before its previously first-documented appearance in Europe. This discovery would appear to confirm Helbaek's hypothesis (1960) that 'flax reached central and western Europe from the Near East via the Balkans and the Danube'. Until the plant husbandry of Mesolithic settlements in Europe is investigated more fully, however, we cannot be certain that flax was not developed as an indigenous rather than an introduced cultivar.

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# The Cretan 'hornet' pendant

PLATE XXVI*b*

*Professor O. W. Richards, FRS, Emeritus Professor of Zoology and Applied Entomology, Imperial College, London, sends us this interesting note on the Cretan golden pendant commonly described as representing two hornets.* This beautiful golden pendant preserved in the museum at Heraklion came from the cemetery of Mallia (17th century BC) (PL. XXVI*b*, left). The postcard commonly obtained in Crete describes the insects as bees which is certainly incorrect. Reynold Higgins, in *Minoan and Mycenean art* (London, 1967) illustrates the pendant in colour, calls the insects hornets (as do other authors) and dates it from 1700–1550 BC.

To an entomologist, it is clear that the insects represented are not bees and almost certainly not hornets, but very likely a social wasp of the genus *Polistes*. These wasps have no English name as they do not occur in England though the Germans call them 'Feldwespen'. There are several common species in the Mediterranean which would be indistinguishable to the layman. They can be quite common in gardens and sometimes build their small combs under the eaves of sheds or houses.

There is a species of hornet in Crete (*Vespa orientalis*) but the base of the abdomen of the hornet is much more truncate, falling perpendicularly to the point where it is attached to the thorax. The abdomen of *Polistes* tapers quite gradually to its point of attachment and the pendant gives a very reasonable though somewhat schematized representation of the insect. It is possible that some details of other insects have been incorporated and certain features (e.g. the crenellate wing-margin) have been added purely for decorative effect. The nest of *Polistes humilis*, an Australian species, illustrated here, gives a somewhat inadequate idea of what I am talking about, but there is one wasp in profile at the back (marked with a white arrow) that gives some idea of its shape (PL. XXVI*b*, right).*

* We apologize to Professor Richards for adding to his difficulty in obtaining a good photograph by not being able to print it in colour. (*Ed.*).

# Archaeology at Lancaster University

The purpose of this note is to report briefly on the development of archaeological studies at Lancaster University. The University has for some time been keen to establish archaeology as a degree subject and, with recent appointments, degree courses are now planned to begin in 1974–5. The development is taking place in the Department of Classics—now renamed the Department of Classics and Archaeology—under Professor M. M. Willcock. There are