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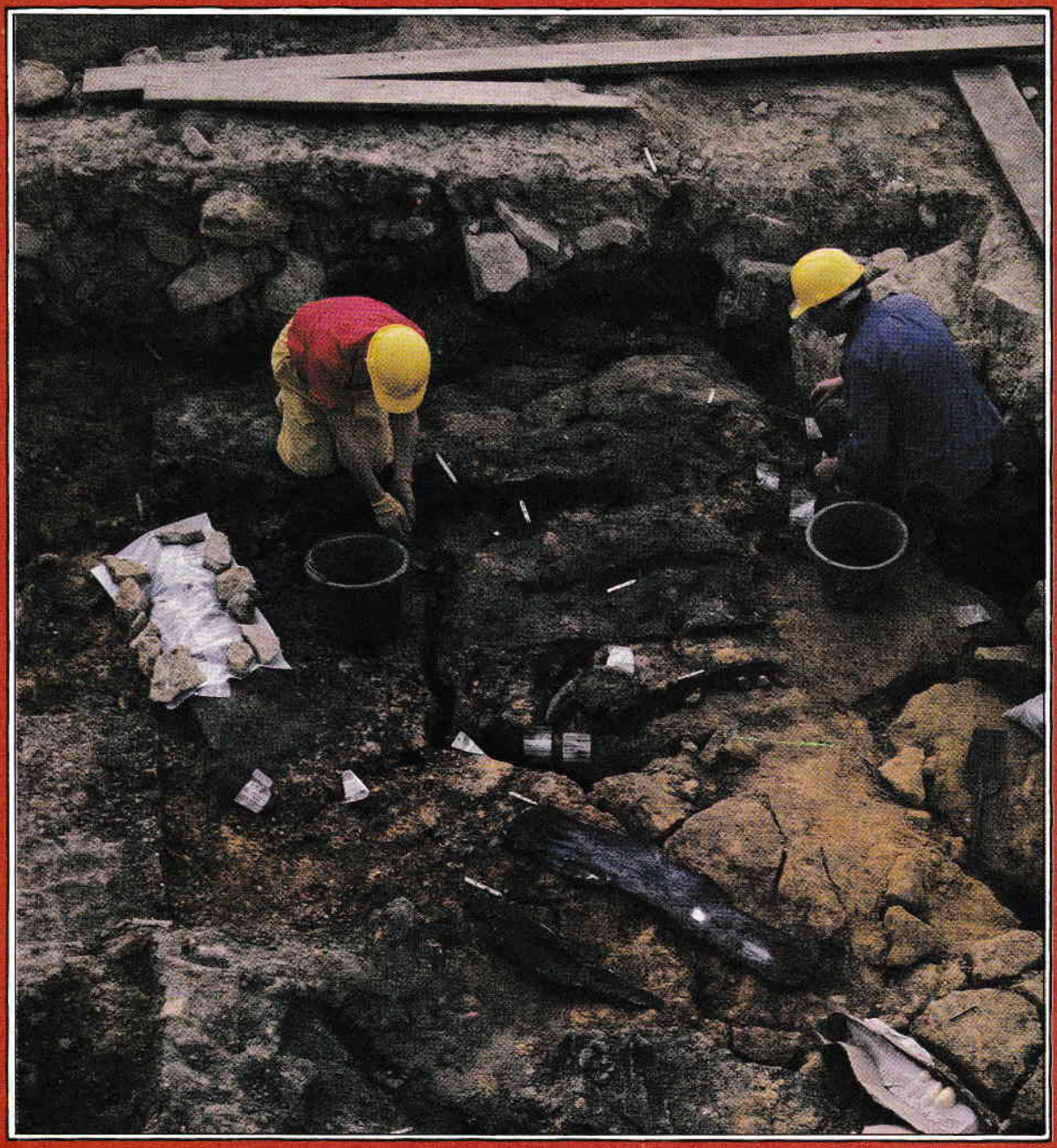


PREHISTORIC PLANT COMMUNITIES

report by Dr. P. J. Reynolds

Our knowledge of past landscapes is drawn from a number of different sources. Primarily we rely upon assemblages of carbonised and charred seeds recovered from excavations of settlement sites of different periods. Alternatively pollen grains preserved in acid soil conditions, usually peat bogs, allow us to identify vegetation through time even down to individual plants. The third source, no less significant but unfortunately much rarer, are waterlogged deposits were normally biodegradable material survives virtually intact in the anaerobic conditions. While important, this last category, by definition, argues that they are untypical of the broad picture of the dry landscape representing as they do wet sites with the attendant flora of such zones. Similarly pollen grains recovered from cores taken from peat bogs can only give a generalised picture since their arrival in the peat is subject to a number of vagaries both of the individual plants and the changing weather patterns. Even more careful and precise sampling from such cores, along with improved dating systems, allow great insight not only into the plant communities, whence the pollen originated, but also the prevailing climate at those specific times. Plants, perhaps more than any other indicator, are sensitive to climate variation and change.

The primary focus, however, is upon the carbonised seed evidence which is recovered by excavation. Exactly how the seed was charred and then distributed, either randomly about the site or thrown into rubbish pits, is a matter of some conjecture. Nor can any such assemblage claim to represent anything other than a presence and absence list. In practical terms the

source of such seeds, especially those of food plants which are of especial interest, has to be outside the settlement. Cereals quite obviously were grown in the fields and prior to their accidental carbonisation have to be harvested, gathered and transported into the settlement where, presumably, they are stored prior to use. Accidental carbonisation and subsequent disposal most likely occurs during the preparation of the raw seeds for consumption. This operation represents in effect the fourth or fifth phase of a process and is so far removed from the source as to be barely reflective of it. Nonetheless the identification of the carbonised seed, however they became carbonised, does allow important identification to be made. For example, the typical wheats of the medieval period were bread wheat (*Triticum aestivum*) and rivet wheat (*Tr. turgidum*) while club wheat (*Tr. compactum*) and spelt wheat (*Tr. spelta*) while present seem to be not significant. In contrast the evidence

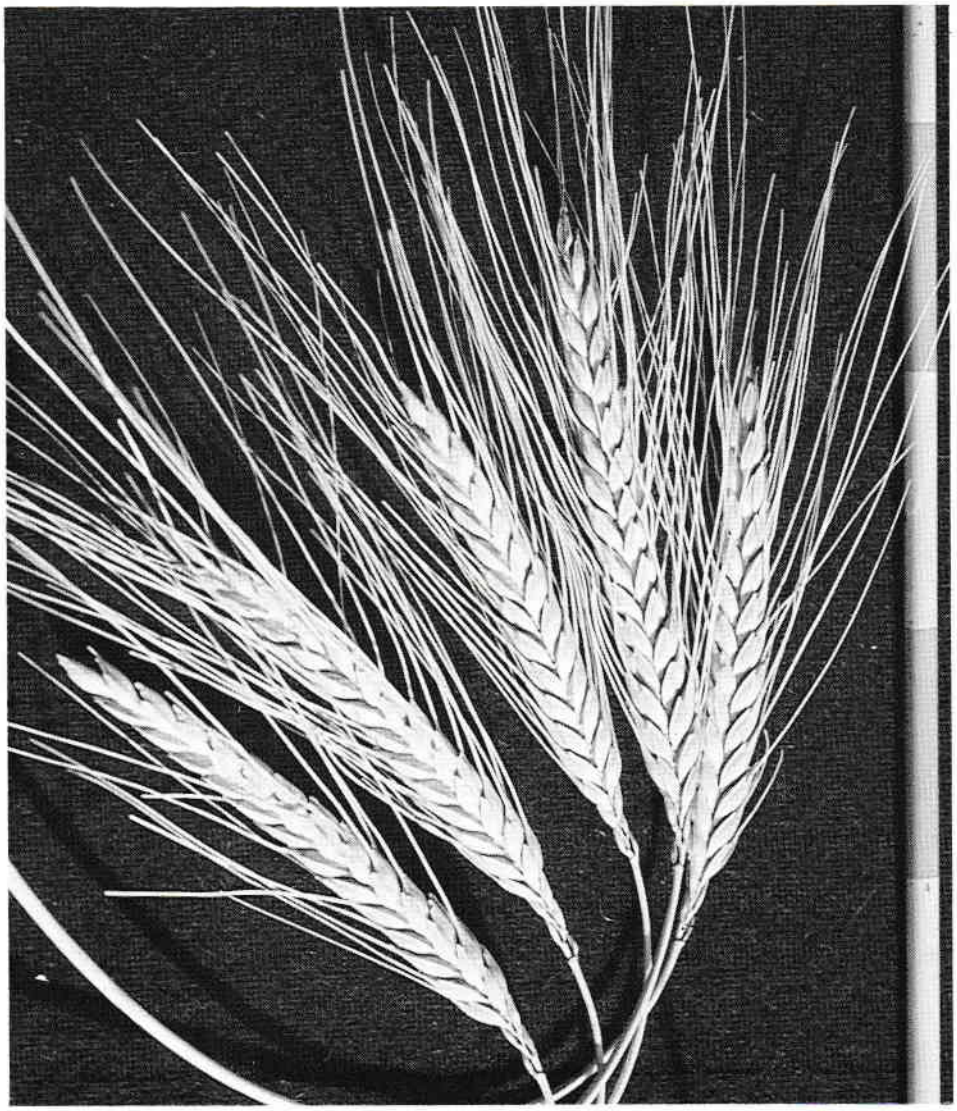
FAR LEFT: Emmerwheat 'Celtic Gold'

RIGHT: General view of Emmer wheat and arable weeds.

BELOW: Detail Emmer wheat and poppies.

from Iron Age sites suggest that emmer wheat (*Tr. dicoccum*) and spelt wheat (*Tr. spelta*) were the dominant types with bread wheat (*Tr. aestivum*) and club wheat (*Tr. compactum*) of less significance. The list, however, is not restricted to wheats alone. Four types of barley have been identified (*Hordeum distichum + var. nudum* and *haxastichum + var. nudum*) as well as rye (*Secale cereale*) and oats (*Avena sativa*). These cereals are further supplemented by the pulses (*Vicia faba minor*), vetches (*Vicia sativa and Vicia cracca*) and peas (*Pisum sativum*). Non food crops are also present in the form of flax (*Linum usitatissimum*), gold of pleasure (*Camelina sativa*) and hemp (*Cannabis sativa*). Added to these crop plants are a plethora of weed seeds, many of which are today either rare or have completely disappeared from our landscape.

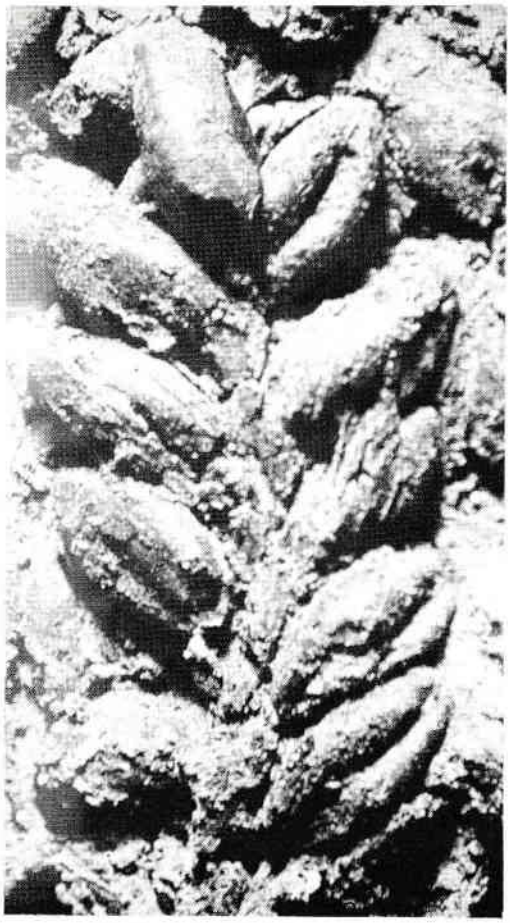
It has been a core research programme at the Butser Ancient Farm to attempt to understand these seed assemblages, not so much from the point of view of how they came to be carbonised, although this aspect too is studied, but rather how they fared and interacted as actual plant communities in the fields. The first objective has been to assess the potential yield of the wheat cereals, emmer and spelt with club wheat and old bread wheat. The interim results of this long term programme will form the subject of the next article in this series. However, the very process of growing the cereals has allowed considerable understanding of what happens within a simulated Iron Age field. It is only when one begins to implement such a programme that all the variables and possibilities emerge. The evidence from the prehistoric ploughs, or ards, clearly indicates a high level of sophistication in soil preparation. Of all the ards the seed drill is perhaps the most significant. It implies that seed was sown in rows and thus facilitated crop management. Without it, or some other device as yet unidentified, crop growing would have been virtually impossible for no other reason than the presence of charlock (*Sinapis arvensis*). Well attested in the carbonised seed record, this plant represents the greatest enemy of farmers, both historic and prehistoric. It germinates along with the cereal and with its broad leaves and swift growth can, unless checked by hoeing or hand weeding, shade out and destroy the slower growing cereals. Other significant enemies include chickweed (*Stellaria media*) and docks (*Rumex sp.*). It is also virtually impossible to eradicate these weeds from fields since their seeds have dormancy factors



ABOVE: Spikes of emmer wheat in the natural state (scale in 50mm units).

spanning decades and perhaps centuries. The weed communities in arable fields are also fine tuned indicators of the weather in any particular season. For example, if the early part of the season is dry and cool charlock growth is inhibited while the poppy (*Papaver rhoeas*) is accelerated and becomes abundant. In a very real way the delicate inter-relationship of arable weeds with the weather underlines the uniqueness of each season and at the same time makes the understanding of the carbonised seeds even more difficult. Field management, too, can alter abundance factors dramatically. When a field becomes infested with couch grass (*Agropyron repens*) every effort has to be made to weed it out. The niche its absence provides is typically exploited by chickweed (*Stellaria media*).

The study of arable weeds can lead to greater understanding of crop management in prehistory. The common cleavers (*Galium aparine*) is such an indicator plant. It has two germination periods, one in the autumn, the other in spring. Being extremely sensitive to soil disturbance a field planted in the spring is normally innocent of cleavers in contrast to an autumn sown field which is usually infested with this plant the following season. Again its presence in the collection of carbonised seeds from Iron Age sites argues for autumn sowing of cereals with all the attendant benefits of increased yield and earlier harvesting time. Vetches represent a similar kind of possibility. Perhaps they were a crop in their own right or alternatively they represented part of the second class harvest along with other edible and storable plants like fat hen (*Chenopodium album*). The second class harvest simply implies that not only the crop itself was carefully garnered but also other useful plants. However, vetches are legumes and legumes fix nitrogen in the soil. Perhaps they were deliberately sown along with the cereal as a symbiotic benefit. Given the presence of beans and peas it is not unlikely that a simple form of crop rotation took place anyway.



ABOVE: A spike of carbonised emmer wheat (Tr. dicoccum).

Beyond all the potential indicators of management and farming practice the sheer range and abundance of arable weeds is quite remarkable. The strikingly beautiful flowers of corn flower (*Centaurea cyanus*) and corn cockle (*Agrostemma githago*), pheasants eye (*Adonis annua*) and poppy (*Papaver rhoeas*) are complemented by the delicate corn violet (*Viola arvensis*), forget-me-nots (*Myosotis arvensis*) and speedwells (*Veronica persica*). This research programme devoted to the study of the cereals and arable weeds has isolated a particular problem. While a wide range of arable weed seeds have been recovered by excavation, presumably brought into the settlement either with the harvest or the straw, a number of arable weeds seem to escape the process. These are the ground hugging varieties like the corn violet and red bartsia (*Odontites verna*) which are missed by the sickle or scythe. Similarly those arable weeds whose seeds are wind-dispersed like the sow thistle (*Sonchus arvensis*) and dandelion (*Taraxacum sp.*) are poorly if at all represented. The fact that they may not be present or poorly represented does not necessarily mean that they were not there or even abundantly present. In contrast one arable weed which always appears and from its habit of entwining itself about the cereal virtually guarantees its arrival in the settlement is the black bindweed (*Polygonum arvensis*).

The list of cereals and pulses which were grown in the Iron Age along with all the other concomitant plants argues for great complexity and diversity of farming. At the same time the demands of each type of cereal indicate that the farmer had an intimate working knowledge of both the soil and microclimate of his farmland. Clearly agriculture at this time on the evidence of the ards and the seeds alone was advanced and successful.

Indeed, through all periods the plant communities within the arable fields, diverse and beautiful even if totally frustrating for the farmer, are represented by the assemblages of carbonised seed on the one hand and immortalised by the Impressionist Painters, most of whom sought to portray the myriad colours of late nineteenth and early twentieth century cornfields. Who today would set out to paint a modern cornfield?

The Butser Ancient Farm Demonstration Area, set within the Queen Elizabeth Country Park, is open to the public from Easter to the end of September at the following times: Weekends only Saturday 2pm - 5.30pm Sunday 10am - 5.30pm. Daily from 23rd July - 4th September 2pm - 5.30pm Sunday 10am - 5.30pm.

The Queen Elizabeth Country Park is located just four miles south of Petersfield, twelve miles north of Portsmouth off the main A3 London to Portsmouth road. Lecture tours, half and full day schools can be arranged for specialist groups by contacting Butser Ancient Farm, Nexus House, Gravel Hill, Horndean, Hampshire, Telephone: 0705 598838.

COURSES 1988: Full residential courses inclusive of tuition, accommodation and food: Pollens 1st - 7th August, £89.50. Weeds, Seeds & Crops, 15th - 21st August £89.50. Fire, Clay & Metal 24th - 31st October £89.50. For more information contact the above address.

Butser Ancient Farm Courses 1988

COURSE III — EARTHWORKS WORK STUDY GROUP, 25-31st JULY 1988.
Only students who have previously been on a Field Course at Butser qualify. The object of this Group is to examine the implications and role of the typical ditched and banked enclosure of the Bronze and Iron Age and early Romano-British periods. The major focus will be upon the experimental earthwork programme of the Ancient Farm. Erosion patterns including ditch profiles will be assessed, differential vegetation recolonisation recorded and pollen rain analysed. Field visits to Wareham and Overton Down experimental earthworks and the major prehistoric dykes of Wessex.

Course Fee: £80.00

COURSE IV — POLLENS, 1-7th AUGUST 1988
The object of this Course is to give a grounding in pollen recognition and analysis. Work includes collection of pollens, extraction, preparation of microscope slides and identification. In addition fossil pollens will also be processed to identification stage. Bee collected pollens will also be processed. All necessary equipment provided including microscopes, centrifuge, etc. Field visit to R.H.S. Wisley.

Course Fee: £89.50

COURSE V — WEEDS, SEEDS AND CROPS, 15-21st AUGUST 1988.
Work will focus upon the crops and plants of the Iron Age, analysis and recognition of carbonised seed and living plants; experiments in seed carbonisation and analysis will be carried out; crop analysis ref. Emmer, Spelt, Einkorn, Club Wheat, etc; field treatment and subsequent arable weed analysis. All necessary equipment available including microscopes, ovens, etc. No previous experience is required for this course.

Course Fee: £89.50

COURSE VI — FIRE CLAY AND METAL, 24-31st OCTOBER 1988.
This Course examines the problems of Iron Age and Romano-British pottery, its production and firing, bonfires, clamps and kilns etc. For metal production and processing, use of bowl and shaft furnace, bronze manufacture, pouring into open and closed moulds, iron manufacture and processing. Again, no previous experience necessary but students are required to bring their own protective goggles and fire resistent gloves.

Course Fee: £89.50

Each course will last for six full working days, beginning at 6 p.m. on the evening of the first day. The Courses are designed to satisfy both general and specific subject requirements although there are no specific academic qualifications needed. Anyone interested in British pre-history, especially the Iron Age, and the processes of archaeology will find any and all of these Courses stimulating and instructive. (Each Course counts as one week of required practical work for the Diploma in Archaeology and Certificate in Field Archaeology of the University of London. Other Universities similarly recognise these as field work components for undergraduates). Each Course is strictly limited to **10** *students.*

The daytime is devoted to practical work both outdoors and indoors including laboratory time with lectures/seminars each evening after dinner. A wine club normally operates. All Courses are residential with full board and accommodation at Nexus House, the headquarters of the Ancient Farm. The accommodation includes hot showers, bath and simple dormitory facilities. Students are requested to bring with them writing materials, hand lens x 10 magnification, full foul weather gear (the English Summer!) sleeping bag and pillow.

For further information please contact Dr P. J. Reynolds, Director, Butser Ancient Farm Project Trust, Nexus House, Gravel Hill, Horndean, Hants. Office Phone No. Horndean (0705) 598838.