BRITISH ARCHAEOLOGY

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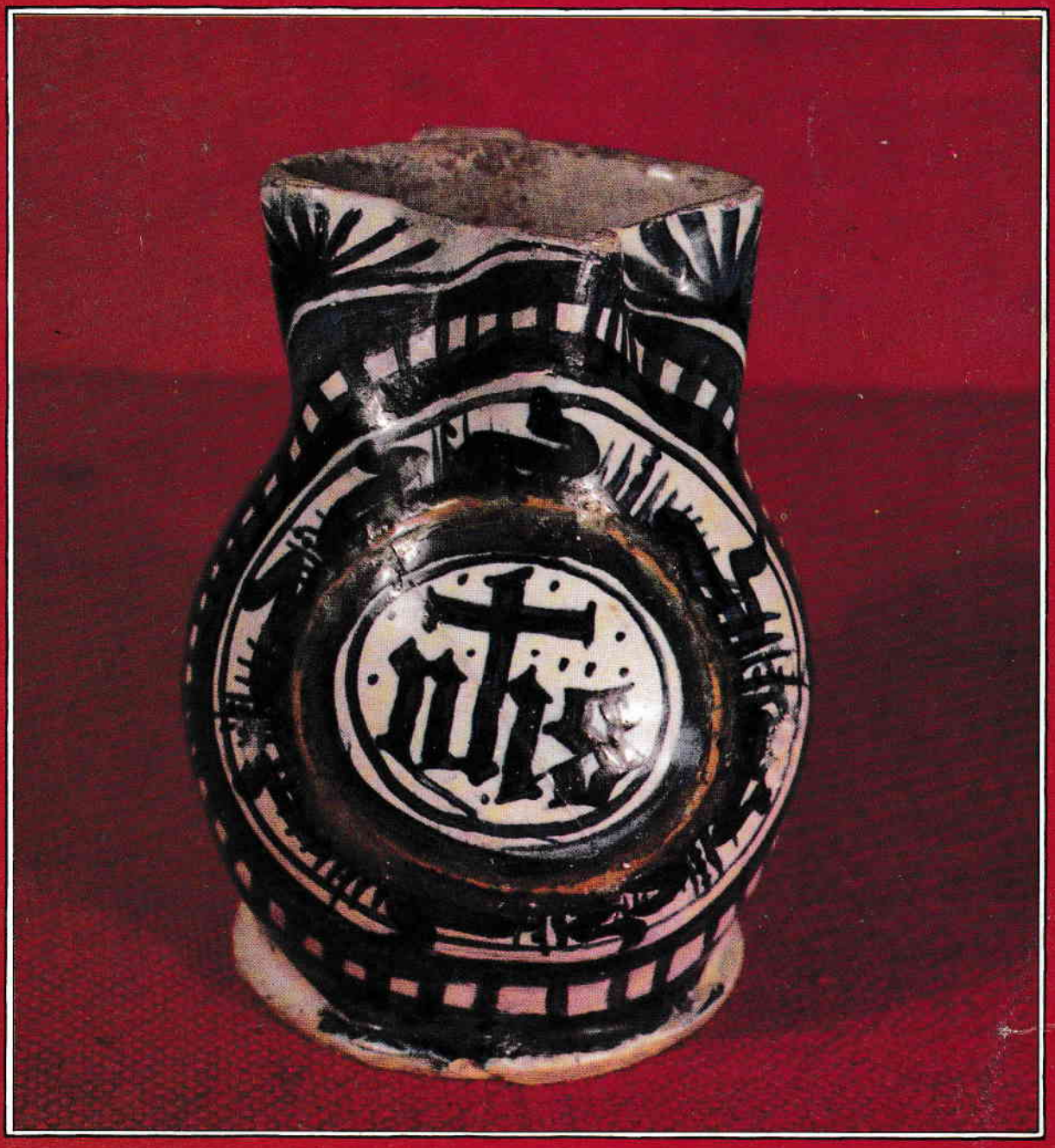
ISSUE No. 12 | March/April 1989 | £1.75



The Ploughzone and Prehistoric Pottery

by

Dr. Peter Reynolds

Field walking has been and continues to be an important, if not critical, element of fieldwork in British archaeology. In practice this means walking systematically across ploughed fields, especially after heavy rain which washes clean objects on the soil surface, looking for evidence of occupation sites primarily by the discovery of scatters or concentrations of pottery sherds. Through time it has been a critical supplement to aerial photography in site location and verification and where aerial photography is not sympathetic to the landscape, field walking has provided the only alternative practical survey. Traditionally it has been the role of amateur societies and groups and represents a major contribution to our knowledge of landscape exploitation.

The ploughsoil has been the object of considerable research at the Ancient Farm ever since the agricultural programmes began. Essentially the primary focus was upon the different ways an ard and a turn over plough actually moved the soil, the former by stirring the soil or rotating it in the horizontal plane, the latter by turning it over or rotating it in the vertical plane. Although the wooden ards wore away quite significantly they have proved to be remarkably efficient (see *British Archaeology No. 7*). This study not only focussed upon the ploughs and the ploughsoil but also upon objects within the ploughsoil or ploughzone and how they were moved by the plough or ard. The question being explored is twofold. The first part concerns how the plough breaks up the evidence, particularly pottery, and whether a stage can be reached where the size of the sherds becomes stable but can still be observed by field walking. The second part is concerned with the positional relationship between sherds found on and in the ploughzone and any underlying archaeological feature whence the sherds were originally torn by the plough. In effect, does ploughing the soil, whether by prehistoric, historic or modern cultivation, completely divorce the sherds from their originial deposition point. This whole question is of critical importance since it is currently believed that plough damage is the greatest threat to archaeology on the one hand, on the other that ploughsoil or topsoil in general, because it has been 'massively' disturbed, is of no archaeological significance and can, therefore, be stripped away in advance of any excavation. The simplistic view of this problem is the contradiction of locating an occupation site by discovering a concentration of sherds in the ploughsoil and then discarding this evidence as being too disturbed to be relevant to the material beneath the ploughsoil. This article is devoted to addressing the first part of the overall question — at what rate does modern ploughing break up the sherd evidence? The second part will be the subject of an article in the next publication.

A unique opportunity to examine this problem, especially as it concerns prehistoric pottery, arose from the work of Mr W. F. Budden of Manor Farm, Chalton in Hampshire. His consistent fieldwork over many years allowed the important 'Evolution of a landscape' to be postulated by Professor Cunliffe (1973). It is on one of the site on Manor Farm, discovered by field walking but which has not been excavated, that the following analysis is based.

A Bronze Age hillbrow site was located by pottery distribution on Camel Down in

Hampshire (O.S. 739180) in 1968. Despite the intensity of occupation of this general region through all periods, on this particular site there were virtually no other intrusive pottery sherds at all. Nonetheless the concentration and quantity of material recovered indicated either a long term or very large Bronze Age settlement.

The field area of Camel Down was brought into cultivation in 1951 when the scrub and small trees were cleared with a bulldozer. Originally it was a typical stretch of unimproved downland devoted to sheep and cattle grazing. From 1951 to 1968 it was cultivated for cereals, root crops and regrassed at intervals, approximately one third of the time under cultivation and two thirds under intensive grazing. The cultivation machinery was relatively light. In 1968, however, it was brought into continuous and intensive cultivation when the basic economy of Manor Farm changed to an arable regime. The agricultural history of the area for the period 1968-88 is presented in Table 1 below.

Table 1 Cultivation Record of Camel Down 1968 - 1988

Agricultural Process

	Plough	Cultivator	Roller	Drill	Harrows
Frequency	x 21	x 42	x 42	x 21	x 21

Ploughing normally took place in September with a multi-shared turn-over plough to an average depth of 200mm. The creation of fairly deep furrows brought to increased the surface area of the land and exposed any pottery brought to the surface to frost action and general undoubtedly severe both in terms of friction the surface to frost actionand general weathering during the ensuing winter period. Spring cultivation was carried out with the standard multi-tined chizel plough which brought the soil into a levelled seed bed. The depth of tine penetration into the soil averaged 150mm. The spike harrow completed the process and after sowing the heavy roller compressed the seed bed and thus increased tillering of the crop. The roller used weighed two tonnes across a 5.0m width. The agricultural processes to which the greater pressure per square metre of the tractor itself must be added, is undoubtedly severe bot in terms of friction and pressure. Ironically in terms of survival of pottery sherds all the agricultural processes take place at critical times of the year. Autumn ploughing brings the sherds to the surface and spring cultivation strikes them immediately after the ravages of frost action. In the case of the very coarse pottery of the Iron Age, with its high percentage of inclusive material like calcined flint, a winter's exposure is enough to break down the fabric to the point where any movement will bring about immediate disintegration.

With the discovery of the sherd scatter on Camel Down in 1968 a group of experienced walkers were brought in to walk the area in the late autumn. Several kilos of pottery sherds were collected from the surface. These were the typical late Bronze Age pottery of the area. The clay fabric, probably from the local 'clay with flints' cappings to be found on top of many of the chalk Downs, with flint inclusions had been fired light red at a temperature of c. 900°C. Kilns of this period have so far not been isolated but in all probability they were of the simple updraught variety.

In the late autumn of 1978 the same area was again walked with another group of experienced field walkers and several more kilos of sherds of the same type were collected. Both collections were, of course, kept separate but surface examination indicated considerable differences between them. So different were they that it was decided to carry out a very simple, even simplistic, analysis.

The results of this analysis, inspired a further exercise in field walking after the passing of another decade. The objective, therefore, is to present the results of three field walking exercises spanning twenty years of intensive arable agriculture from 1968 to 1988.

The early surveys of 1968 and 1978 can best be described as typical group field collections of pottery identifying the presence of a particular site and bring back an homogenous collection of sherds. Comparability between the surveys is virtually impossible to establish. Indeed, standardisation of surveys at all, while desirable, is beyond the reality of field walking itself. So much depends upon ground and light conditions and the perception and ability of the members of the group. Sufficient to observe that on the occasions of the 1968 and 1978 surveys there was an abundance of sherds present on the plough surface and that an arguably representative sample of those sherds was collected and brought back to base. In order that the analysis of these collections should be non-selective, each was placed in a cloth bag and gently agitated. A scoop was inserted and a quantity extracted and placed on simple kitchen scales. Rough parity of weight was achieved as can be seen in Table 2. The third field survey was an entirely different exercise. The objective was to collect a quantity of sherds from the ploughsoil surface to replicate the above sampling procedure. In the event, on a perfect day for field walking, excellent lighting conditions, the ploughsoil having recently been subjected to heavy rain, three very experienced field walkers managed only to collect as a totality a sherd weight of c. 650 grams within the space of an hour. Undoubtedly it would have been possible to collect more in a longer time. In effect, six traverses were made across the known site. Less experienced field walkers would most likely have failed to locate the site at all. Yet with the knowledge of its existence, it was quite remarkable how the site was still defined by the pottery scatter difficult though it was to isolate. There appeared to be quite distinct limits spanning no more than two or three metres distinguishing presence and absence of sherds.

Subsequently the three samples were analysed. Each sherd was weighed on a scientific balance to two places of decimals, its area calculated in square millimetres and the weight divided by the area to determine weight per square millimetre. Further calculations determined the mean weight and area of sherds from each sample and the standard deviations of the mean area and weights per square millimetre. All these results are presented in Table 2 Finally, all the sherds were drawn to record their precise shapes, the results being presented in Figures 1a, b, and c. The visual comparison is both the easiest to appreciate and most persuasive of the argument for monitoring fragmentation. Certainly it is clear that the distribution about the mean is somewhat skewed but no more than one would expect from such subjective collections.

It would seem that the question of sherd lamination through frost action for this type of pottery is minimal as the weight per square millimetre and standard deviations of same clearly demonstrate. The sherds are actually being broken up by the agricultural cultivation process. Similarly from the mean areas and weights of the sherds from the three samples the fragmentation is apparently slowing down if only because the size being reached in the third sample is reaching an optimum survival size given the present generation of agricultural machinery. Undoubtedly the larger sherds in the third sample are at physical risk but the hypothesis that their subsequent fragmentation may not alter significantly the overall results of the third sample seems probable. However, if this is the case, it will make field observation even more difficult than that recorded above. The survey scheduled for 1998 might well determine optimum survival size of pottery sherds but the results in all liklihood will prove to be entirely academic. Given this rate of fragmentation field walking could well be by then part of the archaeological heritage. There may well come a point at which degredation or fragmentation of the pottery sherds makes casual observation in the sense of field walking virtually impossible. The pottery, indestructible however fine the particles may become, will stillbe in the soil. Its isolation and identification might only be made by laboratory analysis of soil samples. Yet one suspects that this rate of degradation is, in fact, a particularly and peculiarly modern phenomenon. The highly sophisticated modern farming system, dependent as it is upon the utilisation of agro-chemicals to be most efficient and, the soil and its structure. In order for the agro-chemicals to be most effective and, therefore, economic, the organic levels of the soil are reduced to between three and seven percent. This naturally reduces the particle size of the soil, the by-product being the threat of erosion across all arable regions. Similarly because of the reduction of particle size the soil itself becomes more abrasive. It is not really an idle observation that the soil is almost an irrelevance to modern farming in that any similar medium

would adequately serve. However, in terms of pottery survival and, therefore, site locations, the situation is further exacerbated by the earlier and earlier cultivation times as plant hybridisation develops increasingly successful varieties of cereals. During the winter months when wildly fluctuating temperatures in the soil are the norm, it is not unusual to see ploughs, both turnover and chizel, discs, rollers and power harrows working hard to produce a fine tilth for early cereal planting. The sheer power of the latest generation of farm machinery pulverises the soil and with it all the material therein. This is in direct contrast to the recent past when ground conditions played a much more significant role in the timing of cultivation. Indubitably the damage is severe but its severity is relatively limited in time to the last decade or so. If the predicted withdrawal from marginal lands, made attractively profitable only by agro-chemicals, where many archaeological sites previously unthreatened have been laid waste, actually comes about, the results of this survey and the study of sherd movement in the ploughsoil may provide useful parameters against which archaeological evidence may be recorded and analysed. ■

CUNLIFFE, B.W. 1973 'Chalton, Hants: The Evolution of a landscape', Antiquaries Journal, Vol. LIII, Pt. 2.
REYNOLDS, P. J. 1982. 'The Ploughzone', Festschrift zum 100 jahringen Jubitaun der Abteilung Vorgenschischte der Naturhistoriesch-en Gessellschaft, Nurnberg e. V. 315-341.

TABLE No. 2

Sherd Analysis

	1968	1978	1988
No. of Sherds	95	280	323
Total Sample Weight	887.75 gms	885.63 gms	649.06 gms
Mean Weight	9.35 gms	3.16 gms	2.01 gms
Total Area	63,220mm²	78, 268mm²	53,266mm²
Mean Area	665.48mm²	279.53mm²	164.91mm²
Standard Deviation	±258.88mm²	±188.80mm²	±146.89mm²
Weight/mm² mean	0.0130	0.0103	0.0102
Standard Deviation	±0.0040	±0.0033	±0.0039

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COURSE I — GENERAL EXPERIMENTAL ARCHAEOLOGY, 27th March—2nd April
Work will include practical participation in the general and specific research programmes at the Ancient Farm. Topics embrace the theory of empirical research, techniques of prehistoric agriculture including ards, crops and arable weeds, pottery manufacture and firing techniques, smelting and melting of metals; training in prospection methods and devices, e.g. magnetic susceptibility. Field trips are arranged to local sites of importance, e.g. Fishbourne Roman Palace, Portchester Castle, Old Winchester Hill, Singleton Museum of Buildings, etc.
Course Fee: £95.00

COURSE II — SURVEYING, 3rd—9th April
Instruction and extended practice in the techniques of field surveying will be given. Emphasis will be placed upon the use of dumpy, level and theodolite. Recording and drawing will be fully practiced. Included will be the use of magnetic susceptibility meter and resistivity meter surveys. Iron Age earthworks will be the subject of survey. No previous experience necessary for this course.
Course Fee: £95.00

COURSE III — EARTHWORKS WORK STUDY GROUP, 24th—30th July 1989
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, 7th—13th August
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: £95.00

COURSE V — WEEDS, SEEDS AND CROPS, 14th—20th August 1989
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.
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COURSE VI — FIRE CLAY AND METAL, 23rd—29th October 1989
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: £95.00

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.