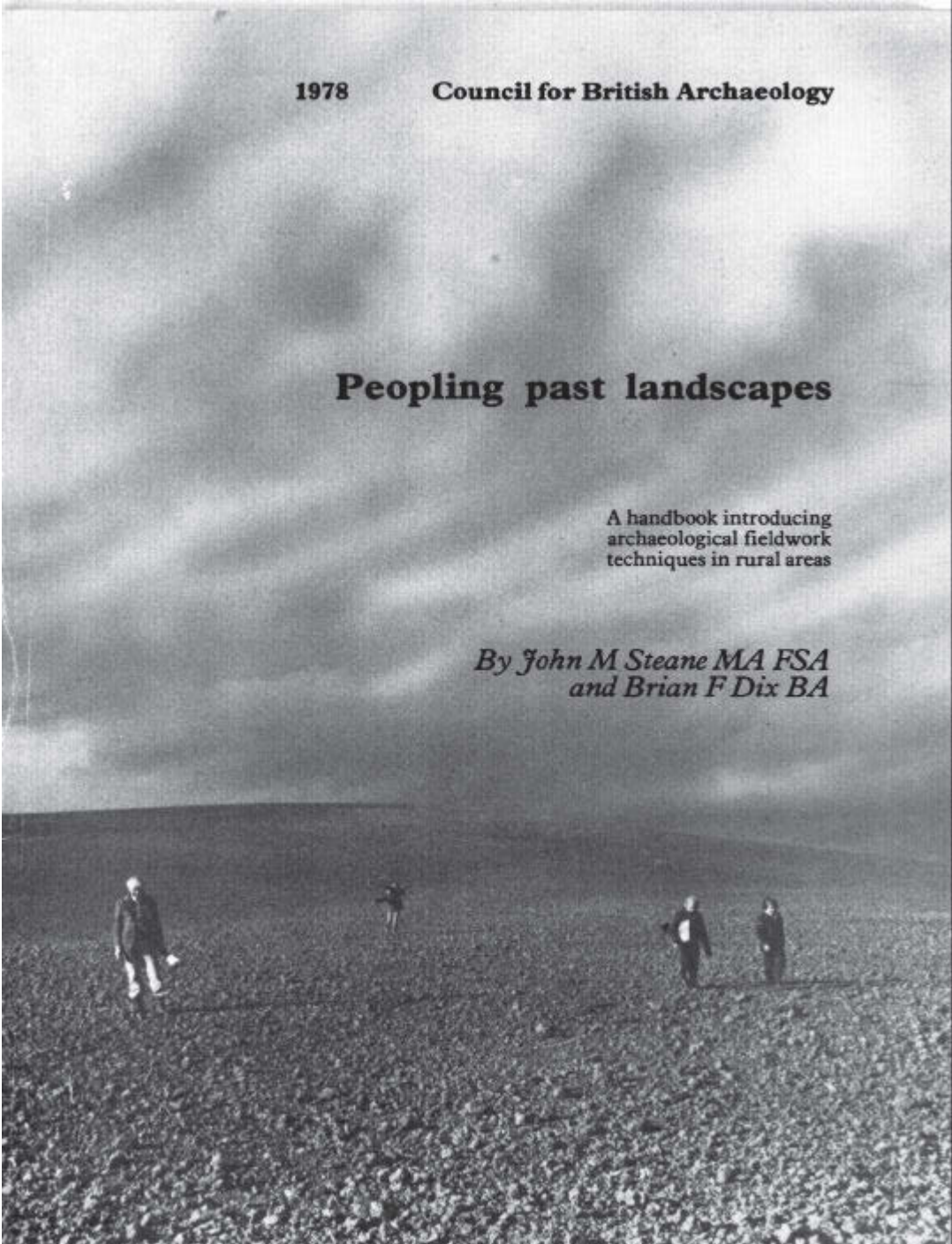
1978 **Council for British Archaeology**

Peopling past landscapes

A handbook introducing archaeological fieldwork techniques in rural areas

By John M Steane MA FSA and Brian F Dix BA



Peopling past landscapes

A handbook introducing archaeological fieldwork techniques in rural areas

By John M Steam MA FSA
and Brian F Dix BA

1978 **Council for British Archaeology**

ISBN 0 900312 81 5

The Council for British Archaeology
112 Kennington Road
London SE11 6RE

Printed at Tomes of Leamington

Contents

Preface

The Council for British Archaeology established its Schools Committee in April 1975 to advise on ways in which archaeology could become better understood in schools. Included among its initial studies were reviews of the various courses submitted in recent years to the Certificate of Secondary Education examining boards as well as surveys of the syllabuses leading to examination in archaeology at the ordinary and advanced levels of the General Certificate of Education. It soon became apparent, however, that many other school subjects borrow from the results of archaeology and such subjects are becoming increasingly involved in environmental work outside the classroom. There are also flourishing school archaeological societies engaged actively in fieldwork. Accordingly we thought it might be useful to attempt an explanation for schools of the accepted fieldwork techniques which archaeologists use in deciphering the various remains which constitute, for a number of periods, the sole record of man s past. The present handbook therefore describes those techniques used to gain an understanding of the physical remains of former human activity surviving in the countryside.

Although the handbook is primarily intended as an introductory study for teachers and those training for the profession, we hope that it will also be found useful by sixth-form students, people attending adult education courses in archaeology and local history, undergraduates, and young men and women attending professional training courses such as those administered by the Department of External Studies at the University of Oxford.

We worked together during the years 1964-69 at Kettering Grammar School in Northamptonshire. Inevitably many of the examples in this handbook are drawn from our experiences in the midland counties of Northamptonshire, Bedfordshire, and Oxfordshire. Brian Dix went on from the sixth form to read archaeology at the University of London Institute of Archaeology and is currently employed by Bedfordshire County Council as a Field Officer, with responsibilities for the rescue excavation of a large cropmark site in the Great Ouse valley. John Steane was Headmaster at Kettering Grammar School until 1976 and is now Keeper of the Field Section in the Department of Museum Services of Oxfordshire County Council.

We wish to thank Glenn Foard and Peter Woodward for sharing with us the results of their individual experiments with various fieldwalking techniques at sites in the Nene and Great Ouse river valleys, which thereby stimulated several new lines of enquiry. We similarly benefited from an advance reading of George Lambrick s study of ploughing as a destructive agent on archaeological sites, *Archeology and agriculture* (CBA: 1977). A considerable debt is due to Christopher Taylor s outstanding work on earthworks with the Royal Commission on Historical Monuments (England) and his book *Fieldwork in medieval archaeology* (1974). It is therefore with pleasure that we acknowledge his helpful comments and criticisms of a first draft of the present handbook. John Hurst of the Directorate of Ancient Monuments and Historic Buildings, Department of the Environment, has similarly suggested improvements to the text of an earlier draft.

Other colleagues who have helped, particularly with the illustrations, have been John Rhodes, Keeper of Antiquities, and James Bond, Assistant Keeper of the Field Section at the Oxfordshire County Museum. David Hall s fieldwork in Northamptonshire and now in Cambridgeshire has been an inspiration to us over the last 15 years. Andrew Sherratt of the Ashmolean Museum helped us with the prehistoric pottery and Maureen Mellor of the Oxfordshire

Archaeological Unit helpd us with the medieval pottery. Ival Hornbrook and Margaret Herdman both took part in surveys involving children from Sibford Gower primary school and Queen s Dyke School, Witney. Our thanks are due to Mary Foster and Carol Cutler for assistance with the original typing and to Margaret Burnett for typing out the final draft. The manuscript has been through a number of drafts and its final form owes a great deal to the patient and constructive criticism of our editor, Dr Kate Pretty of New Hall, Cambridge.

This handbook is a record of the archaeological field techniques worked out over twelve years by the members of Kettering Grammar School Local History and Archaeological Society. It is dedicated to those who walked over the fields of Northamptonshire with such enthusiasm and perseverance.

John Steane
Brian Dix
March 1978

Introduction

Archaeology and excavation

Most children and some teachers, when the word archaeology is mentioned, immediately think of one of two things: digs or museums. Excavation, or the careful peeling away by spade and trowel of the layers of earth to uncover the hidden remains of ancient civilizations, is an exciting and dramatic possibility. Archaeology has captured the imagination of modern generations by a series of memorable excavations all over the world. Much public interest was provoked in the 1840s by the remarkable discoveries made by Botta and Layard in Mesopotamia; the huge sculptured slabs and cuneiform inscriptions from the Assyrian Palaces at Khorsabad and Nimrud were exhibited in London and Paris and caused a sensation. Schliemann s uncovering of the walls of Troy and his discovery of the treasure-filled graves of Mycenae made archaeology a byword throughout Europe. Sir Arthur Evans s excavations at Knossos on the island of Crete signalled the emergence of an entirely new and unexpected civilization. The excavation of Tutankhamun s tomb in 1922 by Howard Carter and Lord Caernarvon and Leonard Woolley s discoveries at royal Ur maintained and stimulated the popular interest in archaeology. In our own day, Sir Mortimer Wheeler, in a series of excavations ranging from North Wales to India, demonstrated that the remains left behind by ordinary people could be just as fascinating as those of their rulers.

As tools, weapons, ornaments, artefacts of all kinds poured out of excavations they were conserved, studied, and stored in museums. Gradually a discipline grew up concerned with recreating the everyday life of past peoples. Recently the natural sciences have contributed new dating techniques and new ways of recovering evidence for past environments. The media, in particular broadcasting by radio and television, have promoted the view that archaeology is an exciting, scientific, and novel way of adding to the sum of knowledge about the human past.

The difficulties of archaeological excavation

Excavation, however, is a specialized and highly scientific process. The digger has a twofold problem on his hands once he has chosen a site, or has had one forced on him. He must record minutely, in three dimensions, the location of the objects, features, and structures as they are found in the strata he exposes with spade and trowel. Secondly he must take immediate steps to conserve what he has discovered. If he fails in the first and bodges the recording, his excavation which is an unrepeatable exercise has destroyed the evidence. The objects cannot be put back into the proper sequence of levels of earth from which they came, nor in association with buildings from which they have been extracted. A physicist can repeat in the laboratory tomorrow an experiment which he does today. A historian can read a document and another can read it again next year or in twenty years time. But an archaeologist, when excavating, has to do the thing right the first time because in excavating he destroys the evidence. Not surprisingly, therefore, excavation is not undertaken lightly. If the archaeologist fails to conserve what he has found, his finds immediately begin to decay. An artefact like a bronze coin or a piece of pottery, or a piece of environmental evidence such as waterlogged timber or leather sealed in an archaeological deposit, has achieved a state of chemical equilibrium. When it is

exposed to the air as it is excavated it rapidly begins to decay. Only first-aid treatment in the field, followed by rapid transferral to a conservation laboratory in the museum will save it from quick and irreversible destruction.

It will already have been realized from this that the tasks of archaeological excavation are almost certainly beyond the normal competence of schools to undertake. Let us take a simple example of what is expected nowadays of a scientifically run excavation: an urban or motorway development has unwittingly struck the corner of an Anglo-Saxon pagan cemetery, and bone fragments, pieces of pottery, and corroded metal lie about on the surface. What can be recovered? The professional excavator, by patiently uncovering and recording the skeletal remains and their accompanying grave goods, can answer a large number of questions. The sex, the approximate age of the person at death, the medical history, and even the cause of death can all be extracted from a study of the bones. More important, it may be feasible to elicit something of the ritual accompanying the burial and from the fragmentary, corroded, and delicate remains of textiles and metal objects reconstruct the life-style and social status of the dead person. Clearly such tasks are beyond the amateur, whether child or adult. To encourage schoolchildren to undertake archaeological excavation is as irresponsible as to persuade them to try their hand at being dentists by practising on the teeth of their classmates. Excavation must be left to the adult professionals.

Field archaeology: the alternative approach

There is another side to archaeology which does not involve excavation and which does not destroy the evidence. This is the study, recording, and enjoyment of the various traces left by ancient man in the landscape what is known as field archaeology. It is in this area that schools have a useful part to play. Field archaeology is involved in two basic types of evidence: sites and monuments. Let us take *field monuments* first because they are upstanding and can hardly be ignored. By field monuments we mean the remains of structures, either buildings or earthworks, which are still visible and obviously point to the existence of former human activity. Stone circles, earthen barrows, the grass-grown ramparts of hill-forts all make an immediate visual impact on and physical contribution to the modern landscape. The importance of many of them is recognized by the State in according them a measure of legal protection. Several thousands have been scheduled as statutory Ancient Monuments which theoretically protects them from danger. The State has also taken some monuments of national significance into Guardianship and these are well repaired, interpreted, and made accessible to the public (on payment of small entrance fees).

Far more frequently found, if one takes the trouble to look for them, are archaeological *sites* which have no visible ruins and perhaps only slight earthwork remains. The sites of former villages, industrial enterprises, or religious foci may betray themselves by nothing more substantial than a jumble of grassy mounds and hollows or by the presence of debris in the plough-soil. Because of intensified methods of cultivation and changing land-use, the greatest number of sites will only survive as a scatter of potsherds (fragments of broken pottery vessels), building materials, or humanly flaked flints on the surface of ploughed fields. Alternatively, sites may show up as soil discoloration. Fire-reddened material betraying the presence of a former hearth, pieces of black charcoal, and the darker organic fill of former pits, drainage ditches, or holes to receive posts may be revealed on the field surface. These disturbances often

come into sharper focus when the fields are under a cereal crop and the plants grow at different rates depending on the distribution of nutrients in the soil. The outlines of ancient buildings, long levelled, miraculously appear for a few weeks each year as the crop ripens. Photographs taken from the air at this time locate and delineate their plans.

Schools and field archaeology

Why should schools interest themselves in field archaeology, particularly at a time when there are other new and competing studies and interests trying to find a place in the crowded curriculum and the short school day?

Field archaeology has a number of attractions for children. Furthermore, it offers an important educational experience.

1 Fieldwork, by definition, must be done outside the classroom. Whatever preparation is undertaken in the library or laboratory, it is followed by expeditions into the countryside. Much local history in the past has been weakened because of the unwillingness of its practitioners to put on their walking boots and make reconnaissances on foot into their chosen areas.

2 Once into the countryside, children are encouraged to develop powers of observation. The basic commodities which surround us in the countryside such as stones, soils, grass, arable crops, and trees are invested with new interest and new meaning when children realize that they bear the marks of succeeding generations of men exploiting their environment.

3 Further, it is often concerned with objects, the material and tangible remains left by man in the past. Children delight in looking for, picking up, and handling such objects as pottery, quern stones, iron locks and keys, flint arrowheads, and stone axes. Many of the more lively modern museums capitalize on these interests and provide objects to be handled. The act, for children, of being able to grasp a prehistoric rotary quern, and even to feed grain into it and grind flour, is worth pages of explanation.

4 Field archaeology not only exploits this love for the tangible, it also stimulates the historical imagination. The Iron Age pottery fragment on the field-edge was once part of a vessel fashioned by the potter for a specific purpose two thousand years ago. By studying the potsherds it may well be possible to say what the original form of the vessel was, how it was moulded, where the clay and its inclusions came from, and how it was fired. It may even be possible to make an intelligent guess as to what it was used for. To pick it up twenty centuries after it was broken is to establish some kind of relationship with its maker. At the very least this process leads to a deeper appreciation of the limitations and problems forced on men operating a primitive technology.

5 All the fruits of this observation will be lost unless it is accompanied by systematic recording. Since it does not involve digging holes, archaeological fieldwork is non-destructive in the excavation sense. The collection of artefacts from the surface of ploughed fields does, however, constitute removal of the evidence. It should be organized systematically and accurately recorded. The processes of accumulating data by observation, followed by painstaking recording, are, of course, essential elements in scientific modes of thought. They give children an insight into scientific method.

6 Finally, it can justly be claimed that fieldwork undertaken by schools is of valuable service to the community. The rate of destruction of the nation s archaeological heritage by modern developments is frightening. In the third quarter of the 20th century an area roughly the size of Berkshire has disappeared

every seven years under roads and urban, industrial, or housing development. This, of course, has meant that many archaeological sites have disappeared without recording and without trace. The rate of destruction of field monuments under ploughing is also a national disgrace. School children can make a major contribution to the compilation of a comprehensive record of the archaeological sites of this country. If *they* do not do it, it is unlikely to be done at ail. It is a sad reflection, but a true one, that adults have less time, less energy, and less perseverance, and are caught up in other pursuits. They have failed in general to make that major recording contribution which hundreds of adult-education tutors in archaeology up and down the country have been urging for years. It is to be hoped that schools will take up the challenge.

Schools are excellently placed to act as bases from which to launch archaeological fieldwork for three reasons:

i Schools are centres of interdisciplinary learning and contain a variety of skills and expertise which are indispensable to such a cooperative enterprise. Secondary schools contain chemists, historians, geographers, and flourishing practical subjects departments. The chemist can provide the simple equipment needed for testing the acidity and alkalinity of soils. The geography department is likely to possess elementary surveying equipment. Historians, familiar with archives, can give guidance on documentary sources. The practical studies department can assist with advice about metals, slags, and industrial techniques. The skills of technical drawing are vital when preparing plans and illustrations for publication. All can combine to promote this valuable example of an integrated study.

ii Schools, even more than museums, are an accepted part of the community, seen by the public to be fulfilling an indispensable role in training the young. For this reason, the reacher with a group of children is unlikely to be refused access to land as long as he is courteous to farmers and keeps his charges in good order. We can never remember an occasion in twelve years of field walking in Northamptonshire when we were refused access to land. The only two occasions for a contretemps were both connected with sport, which Englishmen take much more seriously than making a living: one happened on a golf course as field workers walked across a fairway which was being played, the other when fieldworkers swept across a bare Northamptonshire field being shot over by local farmers.

iii Schools are continuing institutions. Children come and go but a number of generations can take part in and contribute towards a field archaeology programme of the kind developed later in this handbook. The security of tenure and relative stability of staffing, particularly in country schools, make possible those fieldwork programmes which extend over several seasons.

Preparation for fieldwork

Before undertaking a programme of archaeological fieldwork in an area near the school or farther afield, background information needs to be accumulated and displayed and discussed in the classroom. We need to understand the significance of our chosen area for human settlement and activity. It is helpful to look at its setting, its rock and soil structure, relief, drainage, water supply, climate, and vegetation. We need to absorb what is already known about our fields before we can hope to add anything by our own observations. Much will already have been written in the form of guides and local histories; maps and plans will have been drawn; people living in our area may have written

letters and journals. Travellers with a wider vision may have written perceptively and sharply about it. Old inhabitants will recall what has happened to the fields they know and have worked in during their lifetimes. Whatever method is used in compiling a dossier of information by reading, looking at maps, or by interviewing people it should be followed by field observation. Gradually the gaps in existing knowledge will begin to appear. Archaeological problems which fieldwork may help to answer will suggest themselves.

Six main approaches are suggested for the compilation of this background information:

1 Geographical: (a) rocks, (b) soil, (c) water, (d) vegetation
2 Maps
3 Printed sources and documents
4 Place names
5 Air photographs
6 Oral evidence

Geographical factors

Rocks

The underlying rocks are important for the field archaeologist for three reasons:

1 *They have probably influenced the original decision to site a human settlement at a particular point.* The spring lines at the junctions of dry limestone and chalk ridges and clayey vales were often sought out for settlement. Gravel terraces overlooking river valleys were frequently favoured. At times even alluvial flood plains were used for seasonal settlement; as floods receded in spring, herdsmen moved in and founded temporary homes near river banks. Even high granite moors do not seem to have deterred Bronze Age farmers with their flocks and herds; here, however, shelter was all-important and the settlements indicated by hut-circles and walled enclosures crouch below the high tors.

2 *They may have provided building materials.* Neolithic long barrows in the Cotswolds, the earliest and most enduring man-made addition to the landscape, were fashioned largely out of material cut from long linear quarry ditches. The great sarsen stones for chambered long barrows and religious monuments like Avebury in Wiltshire were dragged some distance from the downs where the raw material lay scattered in ragged blocks. Iron Age farmers in the Cornish peninsula cleared huge granite boulders from the little fields they were attempting to bring into cultivation. They used them to make their field walls and for the construction of their courtyard houses. Medieval peasants in the south Midlands built long-houses enclosing a living-end for themselves and a byre-end for their animals. The walls were made of cob (a mixture of clay and dung or straw) which they raised on dwarf wall foundations of limestone or glacial boulders. In each case people were using materials closely at hand. Only in exceptional cases, as in the construction of a religious monument like Stonehenge, were building materials apparently brought a considerable distance.

3 *They often throw light on the existence of ancient trade routes.* When the geology is well understood, the appearance of stones which are alien to the area can quickly be recognized. Some rounded boulders will perhaps have been deposited by glaciers, and children rapidly learn to distinguish between a glacial erratic and a weathered piece of local stone. Perhaps more interesting is evidence for trade. They will get a thrill when the fagment of grey and honeycombed stone picked off the field surface turns out to be a piece of Niedermendig lava quarried for querns in the central Rhenish region from

Roman times until the end of the Middle Ages. When you walk over the smooth, grass-grown granite hills of Lundy Island, off the North Devon coast, bits of blue and white flint can be seen glinting in the sun. Every piece of flint in Lundy has been brought to the island by prehistoric colonists. It has recently been shown that honestones of glistening mica-schist, which are frequently found on deserted village sites in the Midlands, were brought to England from Norway from Viking times until the late Middle Ages.

The rocks of a study area can be studied in two main ways, through maps and personal observation. There are two types of geological map: those claiming to describe the disposition of underlying rocks the so-called solid geology and those which attempt to depict the distribution of the drift or overlying mantle, mainly of clays and sands which were left by rivers and receding glaciers. Both solid and drift maps are published by the Ordnance Survey on behalf of the Institute of Geological Sciences, but in some ways they are less satisfactory than the familiar 1in, 2ˆ in, and 6in to 1 mile maps. They are more difficult to obtain and normally have to be ordered through Ordnance Survey agents. Their scale is rather small (1in to 1 mile), some sheets are out of print, and the information is nearly always rather generalized. Finally, their coverage is not total. It may be necessary to acquire more detailed information by paying a visit to the Institute of Geological Sciences in South Kensington, London, where tracings may be made of the 6in to 1 mile maps on which the published versions are based.

Geological maps can contain much of interest to study, but they will only take the story so far. They are extremely generalized, and *schools should be encouraged to make their own observations.* Children can learn much by watching casual exposures of the underlying strata in cuttings made for gas, water, and electricity trenches of various kinds. Stream beds and field ditches can also sometimes display the geology of an area. When a recent trunk sewage-system was being cut through the grounds of a primary school in west Oxfordshire the children were able to see peat exposures which indicated the former course of the winding river Windrush. They were also shown why their school and the surrounding farm and church were sited where they were. The original Anglo-Saxon settlers had chosen the point at which the tough limestone forced its way through the alluvial clays and marshy bed of the stream and provided a well drained flood-free site for their farms. Dynamite was needed to gouge a channel through the hard Forest Marble to take the sewage pipe.

The obvious place to view underlying rocks is the local quarry. Before going to quarries permission should always be sought because stringent safety measures are rightly required in these dangerous places. When long lengths of rock face are exposed, human disturbances such as pits and ditches can be seen in cross-section as darker soil intrusions running down and cutting into the subsoil and rock from the surface. Such a situation was noticed by school children when the pre-Roman Iron Age settlement at Twywell in Northamptonshire was discovered. The dark-brown fill of the bucket-shaped pits appeared in the orange clays which overlay the ironstone, the last being the object of the quarrymen.

Soil

This product of an interaction of rock weathering, worm action, and vegetation is similarly worth studying because it, too, was a notable determinant of the human settlement pattern. Children usually become aware of soil first of all in their gardens at home: their fathers curse as they break up the clays of a council

estate or rejoice in the deep dark loam of a cottage garden which has been cultivated for hundreds of years. There are three good sources of information about soils. First, maps of the *Soil Survey of Great Britain* are accompanied by memoirs or notes. They do not cover the whole country, however, and in any case soils change with every field and sometimes a single field will contain samples of several different soils. A second source is I W Cornwall s *Soils for the archaeologist* (1958), which is particularly useful in discussing the weathering processes and techniques of soil investigation. Perhaps the best book is Susan Limbrey s *Soil science and archaeology* (1975), which goes in detail into the question of soils associated with archaeological features.

Textbooks of prehistoric archaeology used to attach more importance to the lighter and more permeable soils found especially on the bands of limestone and chalk which cross England diagonally from north-east to south-west. Because more evidence of prehistoric occupation survived on those lands it was wrongly thought that they were more densely occupied than the intervening clay vales and sandstone ridges. It is now realized that continuous cultivation after the prehistoric period has largely obliterated all traces of prehistoric farming from the rest of the landscape. Until recent intensive ploughing, lighter and less frequent cultivation left much of the field systems, linear ditches and ranch boundaries, barrows, and other earthworks on the Downs and limestone hills relatively untouched. The gravel terraces flanking rivers such as the Thames, Nene, Ouse, and Trent were closely settled in antiquity as the dense meshes of crop-marks discovered by aerial photography have shown. Increasing fieldwork is beginning to demonstrate that the heavier soils in the Midlands and East Anglia were also occupied and cultivated at this early period. This is not surprising, for if a soil was of good farming quality, the removal of any cover of trees and scrub need not have been a serious obstacle. The relative heaviness of soils can be measured by the amount that sticks on a wellington boot on a wet day!

Children are often puzzled by the depth of soil overlying archaeological deposits. How, they ask, has all this soil built up, burying the remains of ancient buildings? Five principal natural factors lead to soil build-up: wind blows dry soil filling ditches and covering ruined foundations; vegetation grows, decays, and accumulates in the form of humus; water action can bring a deposit of silts or clays; soil, loosened by cultivation, tends to slip down a slope and cover remains of occupation at the bottom. But the greatest soil mover of all is the common earthworm. Since Darwin s brilliant study *Vegetable mould and earthworms* (188l), it has been known that by dragging leaves down from the surface, by boring burrows, and by eating and excreting soil, worms manage to move incredible weights of soil annually. Some quarter of a million worms may inhabit every acre; they move, on average, ten tons of soil per annum.

Equally puzzling is the fact that some sites, even the most ancient, are not covered by any depth of topsoil. In fact on the chalk the opposite process has occurred owing to the weathering agencies of frost and rain. This has led to the rapid evaporation of calcium carbonate over the last few thousand years, and it is reckoned that the whole of Salisbury Plain is now about 18in below its Neolithic ground surface. This explains why many of the great stones comprising the religious monuments such as Stonehenge have fallen over. It may also explain why the settlement remains of the Neolithic and Bronze Age are so difficult to find on the chalk. All but the bases of pits, gullies, and postholes, which are themselves vulnerable to the plough, have been removed by natural erosion.

Water supply and drainage

Most homes in this country have enjoyed a piped water supply for a long time; the towns and cities had gained theirs by the turn of the century, villages and hamlets during the 1920s and 1930s. Only isolated farms in the more remote parts of the highland zone still rely on wells and cisterns. The landscape is in fact strewn with evidence of man s constant and necessary obsession with water supply. Ease of access to water, whether from spring, brook, or well, was of critical importance to the siting of early agrarian settlement. When we explore our chosen archaeological area of study and suspect that we have come across signs of earlier settlement, the question Where was the water supply? should be asked. One of the puzzling features of Iron Age hill-forts is how water was collected and retained in such lofty and waterless tops of hills. The answer may be in dew ponds, saucer-shaped depressions lined with clay which were reservoirs for ground water. The Romans adopted bolder measures to supply their towns, An earthen embanked aqueduct clinging to the contours of the hill was used to carry water from Poundbury (Dorset) to the town at Dorchester. Water was also used for communications when they dug stretches of the Car Dyke, the first canal known in British history, on the western edges of the Fens linking up the rivers flowing north-east to the Wash. Romano-British sites are supplied with stone and timber wells. When collapsed and grassed over, as at the Romano-British village of Woodcutts (Dorset), they appear as concavities in the surface of former yards. Clay-lined water holes and bottle-shaped drystone wells are frequent features of deserted medieval villages. People who live in old cottages in villages are always coming across wells in their backyards and gardens. They have interesting objects preserved in a waterlogged state in the sediments at the bottom, such as whole medieval pots, timber, leather, nuts, and seeds. In farmyards the abandoned cast-iron pumps, well houses, and broken horse-troughs are also archaeological evidence of the Victorian age of high farming with its reliance on vast armies of horses for traction.

Too much water was as much a problem for early man as too little. The Car Dyke (Fig 1) probably helped to drain the Fens as well as to provide a line of communication, and the breakdown of the Roman drainage system in the 3rd century AD led to prolonged freshwater flooding in this low-lying area. The Anglo-Saxons had largely mastered the drainage problems of the clay vale of the White Horse between Abingdon and Faringdon by the 10th century AD, as the numerous references to dics in their charters reveal. Most of the straight stretches of water courses and drains were made in the 17th century or later. Studies like H C Darby s *The Medieval Fenland* (1974) and *The draining of the Fens* (1968) open our eyes to the intricacies of the arrangements made during the last 1500 years for the drainage of this rich region. Centuries of back-breaking ditching and delving, financed by very heavy capital investment, gradually led to the emergence of the blue network depicted on our Ordnance Survey maps.

The field evidence for this is to be found in three main forms:

1 *The water courses themselves,* often straightened and canalized, sometimes replaced much more ancient winding and embanked waterways for their outfall. At times the old river courses, now silted up, can be traced by a line of sedges and other water-loving plants across a field.

2 More puzzling to the field worker are the *earthworks* of leats and mill dams now breached, dried our, and grassed over. Often water was diverted from its normal passage along a stream or river bed at a point higher up and led along an embanked leat to serve a string of fish-ponds, or fill a moat round a farmstead, or was perhaps dammed to form a millpond. The water mill

Fig 1 Vertical aerial photograph taken by the RAF in 1947 of part of the Roman canal system, Car Dyke, South Lincolnshire. The dyke is the earthwork crossing the photograph in straightish short sections. All boundaries come up to but do not cross it, indicating that it is an early feature, probably lst-2nd century AD. It connected the legionary fortress at Lincoln with the granary of the Fens, and also helped to drain this wet region. Later drainage of the I7th-19th centuries accounts for the rigidly rectangular field shapes over most of the lower part. Earlier (probably medieval) fields are shown in the upper part, with traces of ridge-and-furrow and smaller, irregularly shaped ridged fields.

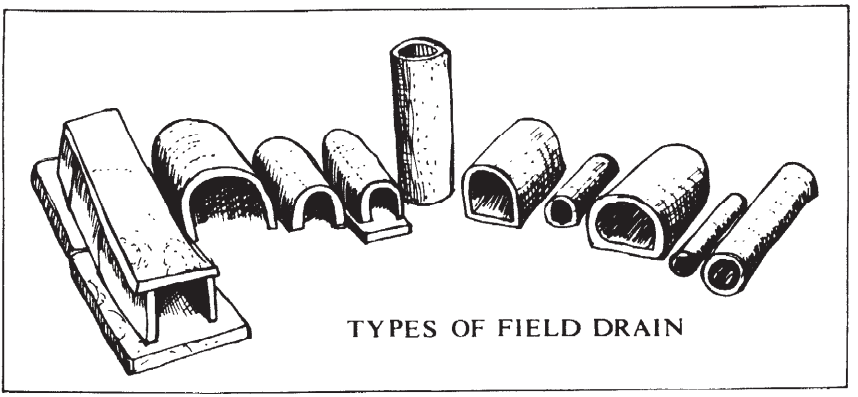


Fig 2 The typological evolution of the field drain. On the left is a stone drain, used from Roman times, through the medieval period and into the 17th century. The hand-made horseshoe-shaped drains are 18th century and are made of tile. For a time they were placed on flat tiles; then the tunnel-shaped drains were made in one piece. With the invention of a pipe-making machine at the time of the Great Exhibition of 1851, the hollow cylinders began to be made in huge quantities. Fragments shattered by the plough litter most arable fields in Britain. They are now being replaced by heavy plastic versions.

itself frequently has vanished or is simply now a tumble of weed-choked masonry. The agricultural revolution of the 18th and 19th centuries with its more intensive stock breeding led to the digging of countless ponds on pasture land throughout the country. These field ponds are a rich habitat for wild life. Modern farmers, seeking to maximize cereal production, fill up these minor ecological oases. They need mapping by schools to record their part in the build-up of the landscape.

3 While they are walking across the fields children can be encouraged to pick up the remains of different types of *field drains* (Fig 2), shattered and brought to the surface by the plough. Stone-capped drains are the earliest, and they were used up to the end of the 17th century, followed by pottery half-cylinders resting on flat tiles; these were superseded by hand-made ceramic pipes and then *c* 1880 by machine-made pipes. The peak of the evolution of the field drain is the plastic pipe.

Vegetation

Soil is one of the determinants of vegetation. The garden analogy is again a good lead-in for introducing children to the idea that the vegetation cover of the countryside depends on the fertility and depth of the soil underneath. They will know that their father s leeks and celery will grow more vigorously on deep, well manured soil. It is not difficult to understand that the deep clayey water-holding soils of the prehistoric midlands are thought to have nurtured damp oakwood, an unending canopy of oak, with interlacing undergrowth of hazel, thorn, holly and bramble , in Fox s graphic words. Archaeologists have been fond of reconstructing the vanished vegetation which covered the land in former

remote periods by drawing maps with highly subjective areas of forest and fen marked in where the known find spots or where the soils suggested they might have been. Sir Cyril Fox s books *The archaeology of the Cambridge region* (1923) and *The personality of Britain* (1943) are seminal works for this approach.

Now more scientific techniques are available and we gain environmental evidence of past climates and vegetations from mollusc and insect remains and plant residues such as seeds, pollens, and nuts. Archaeologists with a training in the biological sciences are now directing excavations with precisely the aim of recovering such past biological data.

Let us take three examples from modern excavations to see how this sort of evidence can help. When Wayland s Smithy, a Neolithic chambered tomb on the Berkshire chalk downs, was excavated in 1962, pollen analysis of buried soils showed that the environment had actually become more wooded *after* the building of the barrow. This later tree cover on the exposed and well drained chalk ridge showed no retreat until the late Bronze Age. The area around the Lambourne seven barrows, two or three miles to the south, on the other hand, appears to have been grassy and open in the Bronze Age but not cultivated. In fact it is flanked by two large areas of prehistoric fields on the high ground on either side. Earthworks sometimes lie on top of and seal buried ground surfaces, thus preserving vegetation and even insect cover intact. Excavations at Silbury Hill, the largest artificial hill in Europe, produced turves which were growing in *c* 2660 BC. They harboured all the insect and plant life that goes with it. Beetles and winged flying ants tell us that the building of the mound started at the end of July or early in August, the time of year when the wings of flying ants develop. All this sets prehistoric field monuments firmly into a prehistoric landscape. Again, pollen analysis from peat near Vindolanda, a Roman fort just south of Hadrian s Wall, shows forest clearance taking place round about AD 122-130. It seems to have been connected with a military operation aimed at laying bare a hinterland within the environs of the frontier defence work.

The principles of pollen analysis and the identification of molluscan and beetle remains can easily be taught in the classroom but it is not practicable to suggest that schools should carry out these techniques, which are more suitable for the university laboratory. There are, however, several approaches to the vegetational reconstruction of past landscapes through the observation of present-day vegetation which are well within the capacity of schools undertaking archaeological fieldwork.

1 *Wild plants can be useful indicators of past land use.* Differential vegetation growth, for instance, may well betray the lines of former water features such as moats and leats which are now choked with mud. This is how a moated site was discovered in the dry summer of 1976 in southern Oxfordshire in a field next to a primary school. It showed up as a brilliant dark green rectangle in an otherwise yellowed and arid landscape. Areas of disturbed soil where building stone has been removed will often attract beds of nettles. Another species of nettle, being greedy for nitrogen, flourishes above the former sites of middens, stockyards, and cesspits. Thus it is possible to map the positions of houses and farms whose foundations lie buried and otherwise invisible under grass. Many deserted medieval village sites show up in this way.

2 It seems likely that some areas, because of unusual circumstances, have preserved *relicts of ancient landscapes* with their rich flora comparatively untouched. Ploughed-up grassland which is then artificially fertilized and resown rapidly produces a botanically impoverished habitat. Careful listing of species can lead to the-identification of areas of old grassland. These

are found at times in the enclosed platforms of medieval moated sites or the ramparts of hill-forts which are inaccessible to the plough. Occasionally patches of hay meadows, such as the famous Yarnton and Pixey Meads to the north of Oxford, survive to give us some idea of the plant wealth of the Anglo-Saxon landscape. We can be certain that archaeological sites are likely to be much better preserved under such unploughed vegetation cover.

3 The most widely known historical ecology technique is that of *hedge dating*. The majority of hedges in an area might well be the result of early 19th century enclosure of the open fields, but just a few will be much older and perhaps relate to Saxon and medieval boundaries. Data based on several hundred documented hedges indicate that the number of different flowering shrub species is proportional to the age of the hedge, and suggests (but does not explain) that on average a 30m stretch of hedge acquires one new shrub species every hundred years. This work is ideally suited to schoolchildren who learn to identify the twenty or so species regularly found in British hedges with ease. They also experience the value of systematic recording. The stretches for analysis should be chosen objectively, with the first 10m of each hedge being disregarded as atypical, especially where it joins a hedge or spinney. Recording should be from one side of the hedge only and as many lengths as possible should be analyzed, although this may amount to no more than three or four. Counts should include tree species such as oak and ash and woody developments like rose; they should not include bramble, which is ubiquitous, being a fast colonizer. Certain species by themselves sometimes point to a distinction between older and younger hedges, as, for example, with the midland hawthorn, *Crataegus laevigata,* which occurs more frequently in pre-enclosure hedges than the common hawthorn, *C. monogyna,* which is now the preferred species for planting. A suggested layout for a recording form is shown in Fig 50 (p 94).

Hedgerow surveys of this kind will distinguish between Saxon, Tudor, and parliamentary enclosure hedges, but will rarely differentiate between hedges planted at either end of the same century. Sometimes hedges originated around woodland, being either planted with shrubs from the wood or created when assarts or clearings were made. Such wood edge boundaries are generally characterized by a rich variety of shrub species, which include hazel, spindle, field maple, and oak and by an undercarpet of woodland plants such as dog s mercury, common primrose, bluebell, and wood anemone. A good guide to the subject is found in E Pollard, M D Hooper, and N W Moore, *Hedges* (1974).

Maps

Most children readily appreciate the value of maps and plans. One of the delights of Robert Louis Stevenson s *Treasure Island* is that the piratical explorers went searching for treasure equipped with a map which was thoughtfully reproduced for the reader. Other writers like Tolkien give verisimilitude to their fantastic tales by producing accompanying maps. Archaeological fieldwork thrives on maps and plans, printed and in manuscript. It involves (as will be described later) the creation of plans of newly discovered archaeological sites and the drawing of distribution maps of human activity at different periods.

Through a study of maps it is possible to disentangle the various changes in an area chosen for study which have led to the present phase of landscape development. Let us begin with the most recent, which are likely to be the

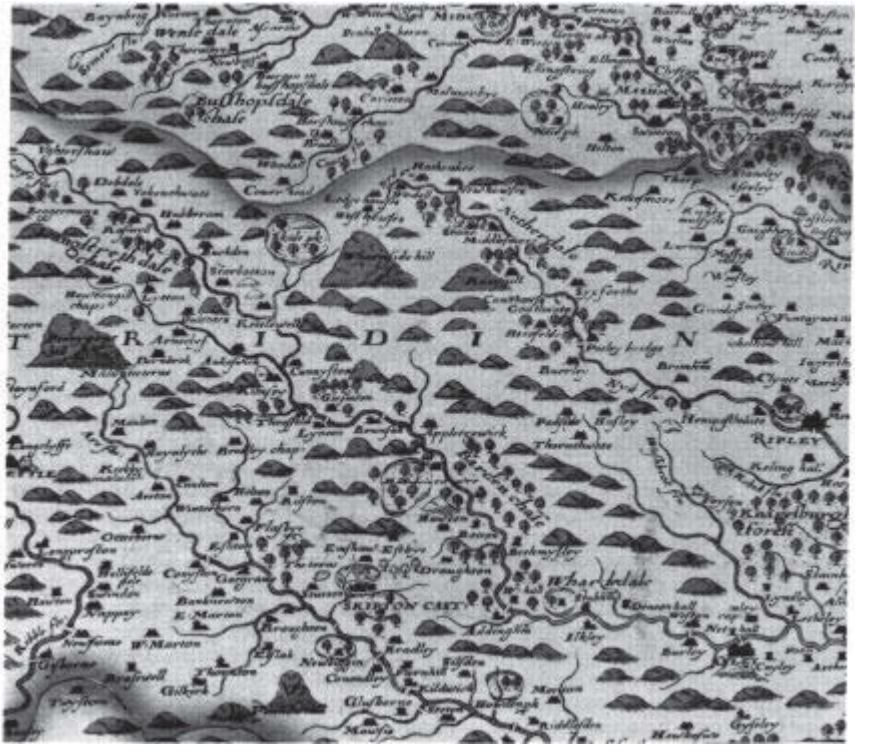


Fig 3 Chtistopher Saxton s map of the County of Yorkshire, 1577. This part of the West Riding *includes the watershed of the Pennine range. The hills are shown as pudding shapes and the rivers as wavy lines. The roads are left out. Parks are oval and circular paled rings. Other features are forested areas, and villages and towns, shown by individual houses and churches.*

most readily obtainable. The *Ordnance Survey* has produced many editions of maps covering the county at several scales. It is justifiably claimed that Britain is the best mapped country in the world. The 1in to 1 mile coverage and its replacement at 1:50,000 scale provides a general view of physical and human geography, and its conventions and interpretations form a part of every secondary school geography course. The trouble, from an archaeological standpoint, is that its practical use is restricted by its small scale. The 2ˆ in to 1 mile or 1:25,000 scale is better in that it provides many individual buildings, most boundaries, and contours at 25ft intervals, in a regional setting. It is often the largest scale on which a parish appears on a single sheet, and, fitted into a handy plastic map case which is supplied free with every map, it is useful for recording with reasonable accuracy the positions of sites within individual fields or other small areas. The 6in to 1 mile maps and their replacements at 1:10,000 scale show accurately all ground features, including field boundaries,

and are ideal for recording the position of field sites. Such things as landowners names and field names themselves may be plotted on these large-scale plans. The largest scale for most rural areas is the 25in to 1 mile (1:2500) survey, which accurately depicts nearly all the significant man-made features to be found on the ground. This is a suitable scale for plotting linear earthworks or multiple features whose precise plans can be drawn directly on to the 25in OS sheet.

The other older and unofficial map sources are very varied in cartographic standard. *Small-scale maps of individual counties,* published between the late 16th and the early 19th centuries (Fig 3), can be found in antique shops (many have been republished in facsimile and can be bought quite cheaply) but they are more decorative than informative. Towns and villages are shown by stylized semi-pictorial symbols; high ground is represented by hillocks looking like inverted suet puddings; the few roads wander aimlessly and indistinctly. They are not accurate because they were not effectively surveyed. They are valuable, however, for display in the classroom because they inspire the historical imagination of children.

Far more valuable for archaeological fieldwork are *large-scale plans of relatively small areas* such as estates or parishes (Fig 4). These survive in some numbers from the 16th century onwards and were very often reliably surveyed. They cover manors, houses, farms, parks, and mines. *County record offices* can supply lists of the places covered in their collections. Such plans can be traced by hand or photocopied, an expensive operation. They are not usually amenable to the much cheaper Xeroxing reprographic method which is suitable for many classes of document, especially those written or drawn on paper. Children will enjoy using these plans because there is nearly always a pictorial element in their conventions. As they make out the buildings, trees, and boundaries drawn in faded brown ink and faint colouring on cracked vellum they get the impression that they are looking at a slice of long-vanished historic landscape. They can be most instructively transcribed into a form comparable with Ordnance Survey maps. By reference to constant features such as streams, fixed boundaries, and major buildings the accuracy of the original plan can be checked and the elements of the landscape existing at the time the map was made can be noted. They can also be compared with aerial photographs (Fig 5). Ancient features can be located in the modern landscape.

The number of such private maps increases during the Tudor and Stuart periods, and they are plentiful from about 1700 onwards. The series of *pre-enclosure maps* commissioned by groups of landowners intent on setting up schemes of enclosure by agreement are valuable in that they depict the 18th century landscape before the last great drive forward to cover the fields with a network of smallish hedged fields. The *parliamentary enclosure* surveys dating from *c* 1750-1850 and the tithe maps of the 1840s between them illustrate the reshaping of the countryside into a pattern which modern intensive agricultural methods have only recently begun to destroy. These last, the *tithe maps,* are on a very large scale (they vary from about 27in to 13in to 1 mile). They give the name of the owner and occupier of each piece of land in the parish. Since three copies were made of each survey one is normally to be found at the Public Record Office; a second may be found lodged in diocesan registries; the third, if it survives, may be found in the parish records.

What can one teach children to look for when analysing such maps?

1 The Ordnance Survey maps themselves contain much archaeological information in the form of antiquities marked on in several conventions. The sheets covering the chalk areas of Wiltshire, Hampshire, and Dorset, for instance, indicate that Wessex was obviously favoured by prehistoric man

because they are thick with the marks of tumuli (burial places or barrows), linear earthworks (possibly boundaries or defences like the Bokerly Dyke and Wansdyke), and hillforts. The archaeological division of the OS, however, only recognizes sites which exist as prominent earthworks, surviving to a height of 0.5m. Very many sites and the number is unfortunately increasing every year with destructive ploughing are only detectable as very slight earthworks, crop-marks, or scatters of material on field surfaces. A blank area on the OS map does not necessarily mean a blank area of earlier human occupation. Another difficulty is that there is little attempt to divide antiquities into periods. On the latest 1:50,000 maps Roman antiquities are shown in roman lettering while all others are classified as non-Roman and are shown in Gothic lettering. Some sites are indicated by a cross. On the other hand, the OS have issued *period maps* from time to time which summarize the archaeological information in an area at the time of publication. The map of *Neolithic Wessex* was produced as long ago as 1932; more recent maps are *Southern Britain in the Iron Age* (1962), *Roman Britain* (3rd edition 1956), *Britain in the Dark Ages* (2nd edition 1966), and *Britain before the Norman Conquest* (1973). Each is accompanied by a valuable essay summarizing the state of knowledge and providing a gazetteer of sites. Clearly, a school undertaking archaeological fieldwork will want to transfer the information contained in these maps to a series of their own period maps at a larger scale to fit the area under study. The preparation of such a series on transparent plastic film (more robust than tracing paper) is an essential precursor to the understanding of the build-up of human settlement within an area. Transparent overlays are desirable because then it is possible to correlate settlement at any period with such relatively unchanging factors as relief, geology, and water supply.

2 Let us take one of the period maps published by the Ordnance Survey, the *Map of Roman Britain,* at the scale o f 16 miles to 1in. Much archaeological work has gone on all over the country in the last twenty years and the pattern of Roman settlement known at the time of the first edition is beginning to alter radically. County archaeological journals contain frequent articles on the discovery of further minor Roman roads which linked many settlements to the major road network. Aerial reconnaissance discovers new forts and villas every year (published in the *Journal of Roman Studies, Antiquity, and Britannia).* Fieldwork, including some notable surveys done by schools, has begun to show that Romano-British occupation of the Midlands, at any rate, was on a far denser scale than was formerly thought possible. This in turn forces us to revise our calculations for the total population of the Roman province of Britain.

One or two possibilities for further work which schools could well undertake may be suggested. Search for more minor roads by considering the total settlement pattern, and see how it relates to the known roads; how were big economic establishments like villas and small towns linked with the rest of the economic life of the country? Such roads may well be on straight alignments and will obviously be very ancient elements in the landscape because nearly all other boundaries (except prehistoric ones) will come up to meet them but will not cross them. Beware of confusing them with the many enclosure roads which were created in short straight stretches in the late 18th and 19th centuries. A glance at an air photograph or a map at 2^ in to 1 mile will show conclusively that they drive over older boundaries, just like the later railways and motorways. A second suggestion is to search for the traces of field and estate boundaries of Roman villas. Much is known about the buildings, little about the fields of which they were the centre. It is possible that drove-ways and ditched field boundaries may have survived unrecognized in the landscape for 1600 years.

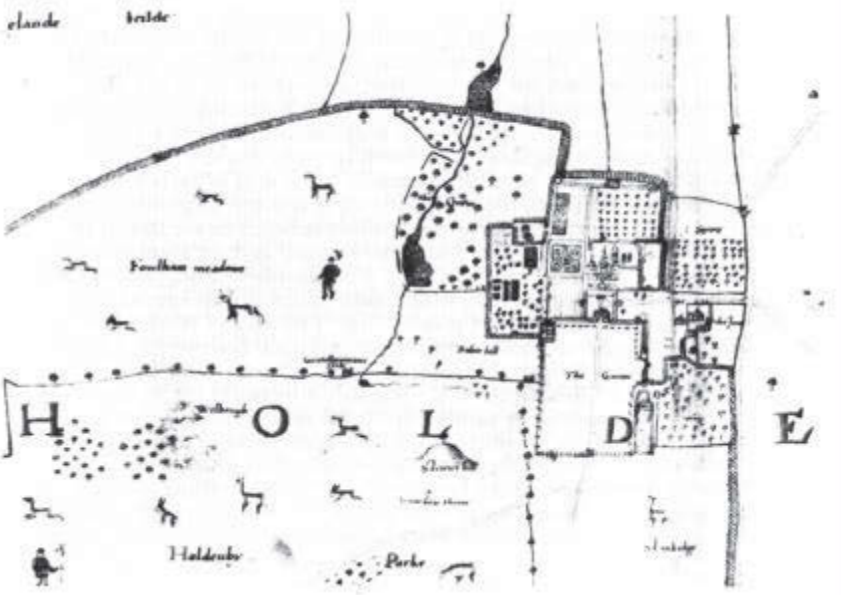


Fig 4 A 16th century estate plan of Holdenby House and Park, Northamptonshire, by Ralph Treswell This plan was made for Sir Christopher Hatton, Chancellor to Queen Elizabeth I. It shows the elaborate house and garden layout to the right of the medieval church and site of the earlier medieval manor. Hatton created a great park, 5 miles in circuit, on the land formerly part of the open fields of Holdenby. This can be seen enclosed by a paling. The gardens to the left of the house have terraces, partewes, fishponds, orchards, andgateways.

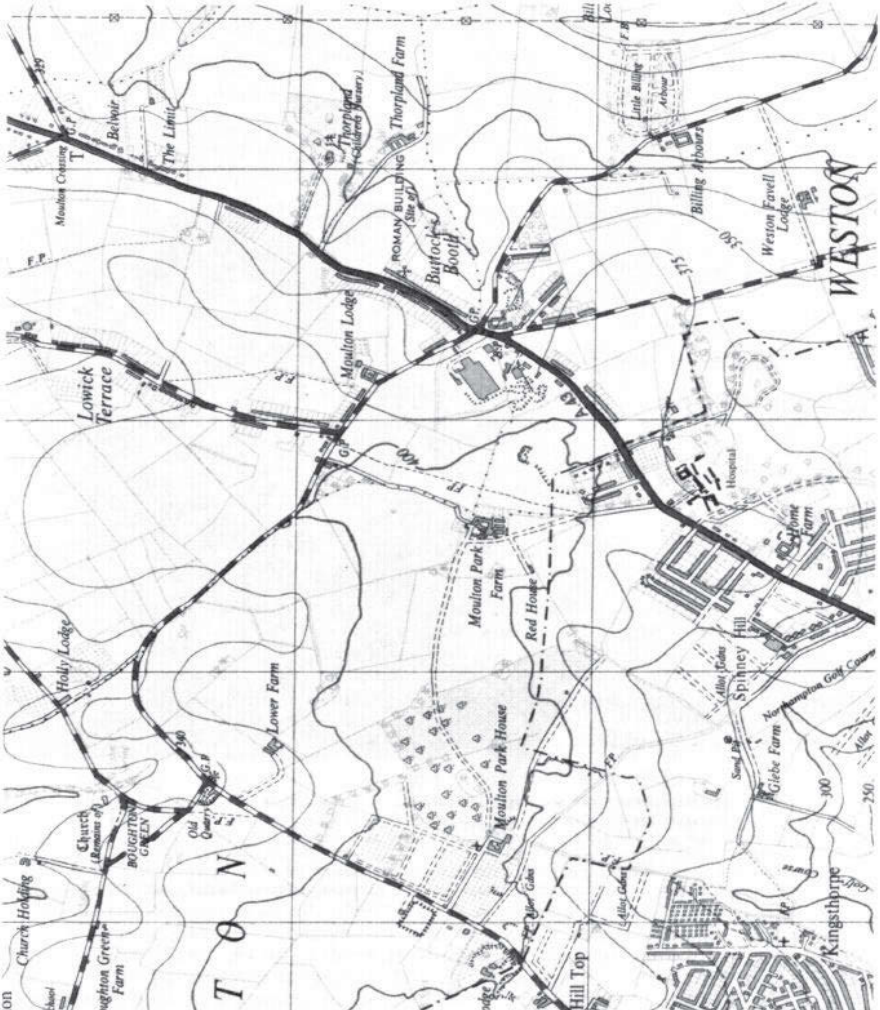
Photo: By courtesy of Northamptonshire County Record Office

3 *Parish boundaries* often date from a period well beyond the earliest documentary evidence. Groups of parishes may well have started off as large so-called composite estates in the Anglo-Saxon period. They were then subsequently subdivided in late pre-Conquest or even early medieval times. These early estate/parish boundaries often have massive linear banks, overgrown with multi-species hedgerows. Children will love to follow them, beating the bounds. Groups of parishes sometimes radiate out from some common area of shared interest; this may be a scarce and valued commodity like rough grazing land. At times there are detached pieces, separated from the centre of the parish by some miles; these may have originated as meadow and woodland, both vital commodities to self-sufficient agrarian communities. The actual shape of parish boundaries sometimes incorporates curious projections or appendages in which there is no present settlement or only a single farm but where formerly settlement existed. Late settlement (ie after the parish boundaries had been demarcated) often occurred on the edge of the parish (see Fig 7). Its position might be matched by the marginal nature of the land occupied, and late settlements often were deserted early. When drawing conclusions about the siting of parish boundaries, however, a warning should

Fig 5 An oblique aerial view of the same area of Holdenby shown in Fig 4. The church and rectangular earthworks of the medieval manor house are seen in the centre. The line of trees in the middle distance crossing the photograph is on the alignment of the Tudor park pale. The terraces of the Tudor garden can be seen in the centre right. In front are the reversed-S shaped curves of the ridge-and-furrow cultivation marks made by the medieval peasant cultivators of Holdenby s open fields.
Photo: Cambridge University Committee for Aerial Photography

be given: they have been subject to frequent revision. If a Tithe Award map of the 1840s is available it is best to check the state of the boundaries of the parish being studied from this. They are very unlikely to have changed markedly in country areas from the 13th until the mid 19th centuries.

4 Anomalies, such as continuous lengths of curving hedge, may be survivals of earlier *parks* (Fig 6). Such boundaries, like Roman roads, may have other hedgelines coming up to, but not crossing them, and this clue suggests that


Moulton Crossing
Belvoir
The Limit
Thorpland (Children's Nursery)
Thorpland Farm
Little Billing
Arbour
Billing Arbours
Weston Favell Lodge
WESTON
ROMAN BUILDING (Site of)
Buttocks Booth
Moulton Lodge
Lowick Terrace
A43
Hospital
Home Farm
Moulton Park Farm
Red House
Holly Lodge
Lower Farm
Moulton Park House
Spinney Hill
Northampton Golf Course
Sand Pit
Glebe Farm
Church (Remains of)
BOUGHTON GREEN
Old Quarry
Church Holding
Boughton Green Farm
Boughton
School
Obelisk
G H T O N
Furze Lodge
Hill Top
Allot Gdns
Kingsthorpe
Cemetery
400
375
350
300
250

they are earlier features. Other evidence for the former existence of parks are the existence of lodges (at times moated), farms with the place-name park, and, of course, the park boundary banks themselves, frequently enlarged so there may be several circuits within the same park as pieces of land were added.

5 Groups of irregularly shaped fields often occur on the outskirts of villages and indicate areas of *ancient enclosure,* predating the age of parliamentary enclosure. Similar irregular boundaries are found on the farthest edge of parishes in areas of former woodland, moor, or common. They represent the work of individual farmers in a period after the open field landscape had been created.

6 *Deserted habitation sites* betray themselves from map study by the convergence of tracks and footpaths which appear to end nowhere but which originally linked the settlement to the outside world. When explored in the field these areas often show the humps and bumps of hollow-ways, ponds, house platforms, and croft boundaries (Figs 7, 10). They are also distinguished by the fact that *ridge-and-furrow,* the corrugated marks of former cultivation, lap up against them and stop short (Fig 8). Furlong blocks of ridge-and-furrow, which can be traced with ease from aerial photographs, are found to fit exactly the shapes of groups of strips that are drawn with such intricate care on the pre-enclosure maps,

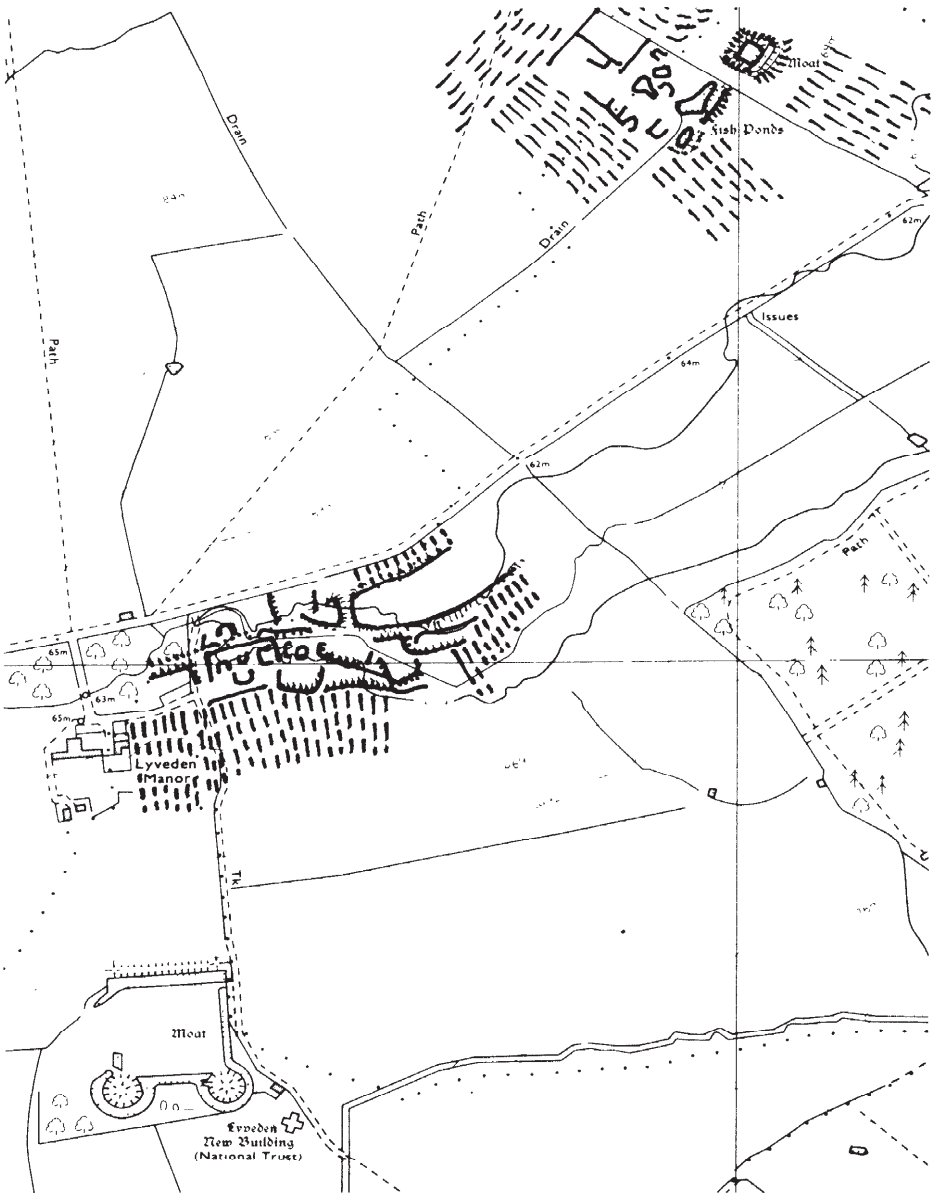
7 Frequently a physical feature which is a *disjointed fragment of a former site* may appear on a map which, when subjected to field investigation, can be reconstructed and fitted into a comprehensible ancient landscape context. The dog-leg appearance of a stream course could indicate where that stream has been previously diverted around a feature such as a mill or ponds associated with fish breeding. Many L- or U-shaped ponds occur which are the partially filled ditched earthworks of moated sites. Now isolated churches may be the only surviving feature of a vanished settlement. They are often found in parks which their lordly owners have created at the expense of the fields and even the houses of a former peasant village.

8 Not only are sites such as moats, windmill mounds, kilns, and furnaces often marked on old maps, but *field-names* such as Windmill Field or Limekiln Piece might also lead to the location of former features in the landscape. Some field names have come down almost unchanged from the early Middle Ages and relate perhaps to sites which have now disappeared. Thus The Towne or Town Fields may indicate the site of a now-vanished settlement, whilst Bury Close might originally have contained the manor house which often became known as The Burystead. Other field names could contain elements such as stony or black deriving from surface observation of structural material or darkened soil brought up by the plough and thus prove a useful starting point to any enquiry.

To summarise, it is possible to build up gradually from a study of the cartographic record of one s chosen area a series of period maps, each of which gives a picture of the density and pattern of human settlement over a restricted

---

Fig 6 (opposite) This section of the l964 1:25,000 (2ˆ in to 1 mile) OS map shows the area north of Northampton. There are remains of the 13th century King s Park at Northampton in the landscape. The signs can be read from the map. They include the curving stretch of drystone wall alongside the B road running north-west from Buttock s Booth. The park follows the parish boundary (another sign: it is on the edge between two parishes on the margins of medieval cultivation) and then curves round (sign 3) towards the site of Moulton Park House (sign 4: place-name). In this stretch of the wall are embedded two carved stones recording the names of townships contributing to the upkeep of the park boundary walls. The boundary then turns east-south-east and runs south of Moulton Park Farm, where its wall has been noticed in section along the hedgerow south of the spring.


Moat
Fish Ponds
Drain
Path
Drain
Path
Issues
64m
62m
62m
65m
63m
65m
Path
Lyveden
Manor
Moat
Lyveden
New Building
(National Trust)

range of time. Such period maps might extend to the bounds of the parish or might be restricted, to begin with, simply to a series of fields. They should be drawn on transparent plastic film so that their relationship to the geological maps and each other can be easily shown by superimposition. Further work in the field could result in the addition of more detailed information to these maps.

Printed sources and documents

Printed sources

It has been suggested that each school undertaking archaeological fieldwork of a given site or area should find out and gather together all the information which already exists. The best starting point is the archive of material formed by the *record cards of the Archaeology Division of the Ordnance Survey.* Such cards are the product of thousands of surveys in the field and the study of published reports by the officers of the Division over the last half-century. The data thus recorded comprise lists of sites and finds of all periods together with detailed map references, descriptions from professional and local amateur fieldworkers, information from museum collections, a bibliography for each site, details of air photographs, and sometimes large-scale plans of earthworks and site photographs. The cards may be consulted or copies made (at a few pence a time) at the OS headquarters in Southampton or at the National Monuments Record in London. Copies of the relevant local entries are often available for inspection in county museums. Having seen the results of this painstaking accumulation of data, children can better appreciate this aspect of the scientific method in action. They can imitate the professionals and be encouraged to build up data collections of their own observations by modelling their records on some system similar to that followed by the OS.

A second major information source is the massive red and gold-tooled volumes of the *Victoria County History,* a national project of historical research begun some 80 years ago but which for some counties is either still in progress or not yet seriously started. It is not a book which every school library ought to stock but the *VCH* (as it is familiarly called) is certainly a source which every teacher interested in archaeology or local history ought to tap. Each volume, as it has been published, has inevitably reflected the historical interests of the period during which its contents were originally researched. The earlier volumes, written when local history was pursued in the studies of squires and clergymen, have an understandable but now outdated emphasis on such topics as ecclesiology, manorial descents, and monastic history. Those sections dealing with the antiquities of the pagan Saxon and earlier periods also suffer from a lack of direct topographical knowledge on the part of the authors. It is often the more

---

Fig 7 (opposite) This section of the 1972 edition of the 1:10,000 OS map has been used as a base plan to plot earthworks (now ploughed out) visible in aerial photographs taken from 1959 onwards. The area is in north-east Northamptonshire, part of the medieval Royal Forest of Rockingham. The earthworks demarcate the deserted forest-edge settlements of Potters Lyveden and Lyveden Parva, situated on cold Boulder Clay uplands on the edge of five parishes. No Anglo-Saxon pottery has been discovered here, a sign of comparatively late colonisation. Excavations at Potters Lyveden have shown that iron smelting was carried on here from 1050 to 1150, followed by pottery and tile making from 1225 to 1475. As the village declined the Tresham family shaped the landscape, substituting large enclosures for arable fields and laying out a huge late Tudor rectangular garden linking Lyveden New Building with Lyveden Manor. Modern farmers have removed most of the 17th-19th century hedgerows and have put in more effective drains, straightening and deepening ditches. *Photo: Crown Copyright*

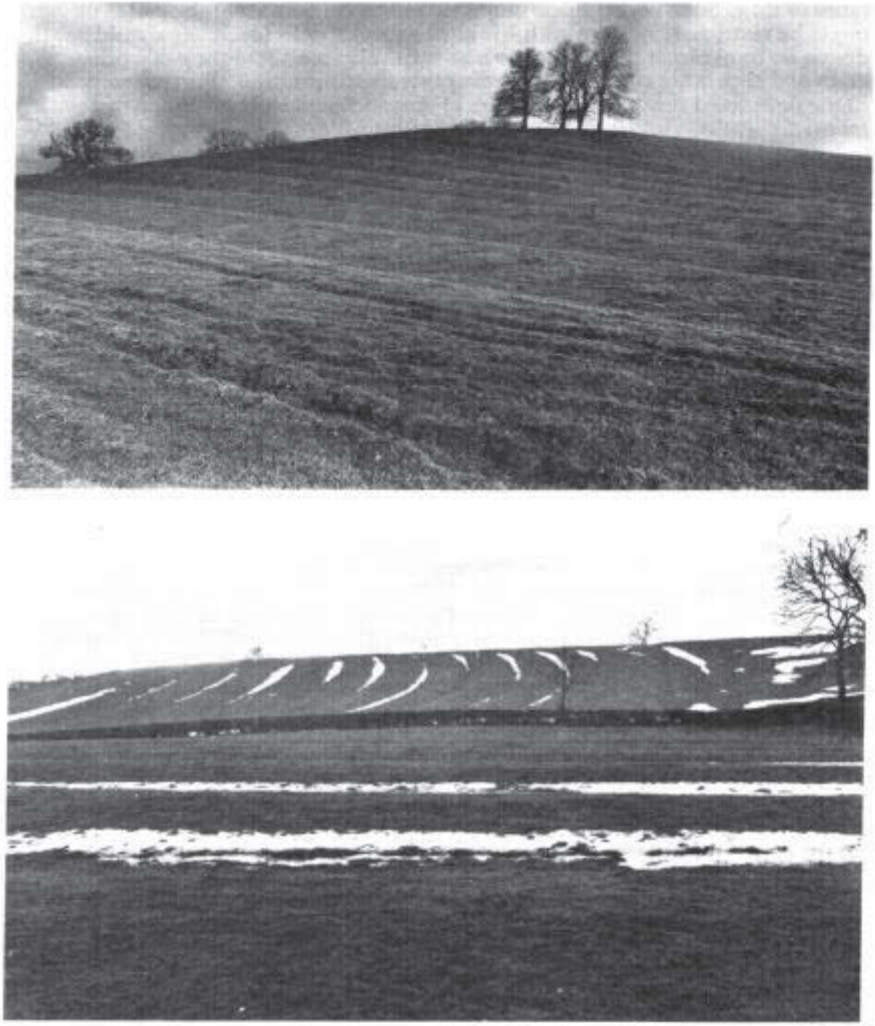


Fig 8 Ridge-and-furrow near Bloxham, north Oxfordshire. Large parts of midland England were covered with these signs of medieval and later cultivation. They were formed by ploughing with teams of oxen along strips or 'lands: which were as much as a furlong in length. Such fields were covered with a chequerboard pattern of hedgerows and ditches during the period of enclosure, and are now often ploughed flat. They can still be detected, however, because of bands of dark- and light-coloured soil. Medieval pottery, the relics of medieval manuring, is often found on the surface of ploughed-out ridge-and-furrow. On the lower photograph there is one furlong block with the cultivation going from right to left in the foreground. An 18th century enclosure hedgerow separates it from the next one, which goes up the hillside. The reversed-S shape of the curved ridges and furrows is clearly seen owing to the presence of snow lying in the furrows.

recent volumes, with their greater emphasis on social and economic history and the more detailed appreciation of the areas they describe, that are of most use to the archaeological fieldworker. The *VCH* is a marvellous quarry because the full references found in its footnotes lead on to further sources available in print and manuscript.

The Royal Commissions on Ancient and Historical Monuments (for England, Scotland, and Wales), founded in 1908, also work on a county basis, and aim to produce ultimately a complete historical gazetteer of monuments specially worthy of preservation. Unfortunately their staffs are small and their painstaking researches inevitably slow; by the time they begin to study an area many monuments have been lost to land development of various kinds. Nevertheless, their published Inventories cover all periods from the Palaeolithic to the 19th century and describe subjects as diverse as burial mounds, Roman villas, nonconformist chapels, and windmills. They are illustrated with plans, elevations, and photographs which are of the highest standard and they are a pleasure to use.

Looking up things is one of the ways we can encourage our children to find out for themselves by using libraries. The keen teacher, anxious to build up an archaeological dossier of his area, will mount a programme of searching local and regional periodicals for references to sites in the area to be studied. He will encourage his senior boys and girls to work through national journals such as the *Proceedings of the Prehistoric Society,* the *JournaI of the British Archaeological Association,* the *Antiquaries Journal,* the *Archaeological Journal,* and so on. Runs of these journals should be available in county and museum libraries. A number of more recently founded journals, such as *Britannia* (and prior to 1970 the *Journal of Roman Studies), Medieval Archaeology,* and *Post-Medieval Archaeology,* additionally contain annual summaries of excavation and other fieldwork. These take the form of gazetteers of sites, period by period, county by county, where fieldwork and excavation have been carried on. There are often interim reports with interpretive plans, very useful for the archaeological beginner who does not wish to wade through full excavation reports. The use of such reference books, supplemented by the annual journals which are produced by the archaeological societies existing in most counties, is a valuable introduction to understanding how indexes and catalogues work. Abstracting information so gained on record cards is again something which involves useful practice in précis, one of the key techniques taught in English language lessons in the fourth and fifth years of the secondary course.

Documents

One way in which historical studies have advanced in schools over the last twenty years has been the introduction of original source material. The handling of documents in facsimile and their transcription, translation, and commentary are no longer the monopoly of the postgraduate researcher in history. Children are now in direct touch with the past thanks to the production of archive teaching units. Sifting the evidence, reconstructing the event, and searching for clues have some of the excitement of detective fiction. Archaeological fieldwork has much in common with this approach.

The earliest documentary references are found inscribed on Roman tombstones or other commemorative or propaganda inscriptions. These are so few and incomplete that the total corpus of Roman inscriptions for Britain would hardly fill an average edition of a Victorian newspaper. The next documents which might repay searching are Bede s *Ecclesiastical History* and the

Anglo-Saxon Chronicle. As one approaches the Norman Conquest topographical references come thick and fast in the 1875 *Anglo-Saxon charters,* documents describing property transactions in the late Saxon period. They contain valuable information about earlier field systems, drainage, woodland, bridges, and roads. P H Sawyer s *Anglo-Saxon Charters: An annotated list and bibliography* (1968), enables the researcher to find quickly whether there is a text which covers part of the area he is interested in.

Domesday Book (1086) provides the first references in the documentary record for a great number of places but it is not an historical gazetteer written for the benefit of the archaeological fieldworker. The teacher needs to understand some of its complexities before use is made of it. The Cambridge historical geographers under the leadership of H C Darby have contributed a comprehensive series of commentaries which now cover the country. For the text itself (and a translation into English) search should be made in the early volumes of the individual *Victoria County Histories.* Professor Darby and his co-workers have shown how Domesday Book can be used to reconstruct a picture of the landscape a thousand years ago. By plotting on county maps using different symbols the distribution of ploughland, woodland, mills, and fisheries, population is graphically portrayed (cf Fig 16). There are many gaps and uncertainties in Domesday, however: the north-western counties are given short shrift, London is left out, and East Anglia is dealt with in more detail than the rest. All in all, however, it is a very valuable quarry, not least for the archaeological fieldworker. There are many places mentioned in Domesday which have now ceased to exist and constitute challenges for us to find in the countryside. Some places not mentioned in Domesday were nevertheless in existence in late Anglo-Saxon England and it has been claimed that there was a greater amount of land under cultivation then than at any time until the mid-Victorian period of high farming. Simply because areas in the 11th century were thickly wooded does not mean that the woodland has been decreasing ever since. Far from it: some areas, such as the Chilterns and central Berkshire, have acquired their thick woodland in the last two hundred years.

Domesday Book is perhaps the most precious national historical document in the *Public Record Office.* It is likely to be one of the few whose name is known to the average schoolchild. In fact there are many thousands of others which contain information that may be of relevance in building up the archaeological record. One does not have to go to the Public Record Office to collect information contained in them. Rows of reference volumes available in the more important city and university libraries contain *calendars,* or summaries and indexes of many of them. Information is indexed under names of places, names of people, counties, and subjects, and so convenient brief descriptions of the contents of documents are available in English. Naturally enough, the best documented estates and buildings were those of the Crown. H M Colvin and others have quarried into the Public Records to produce the volumes of *A history of the King s Works,* in which may be found accounts of royal castles, houses, parks, fishponds, fortifications, and harbour works from the early Middle Ages onwards. Another valuable class of documents useful for the field archaeologist is the inquiries or *Inquisitions* by which the Crown sought to describe or value someone s property, someone s proposed work, or the physical and economic effects of neglect of property by a tenant or former owner.

Documents of various kinds have been used to disentangle individual features of the landscape such as gardens, parks, deserted villages, and failed towns. Here M W Beresford s books are stimulating, especially *The lost villages of England* (1954), *History on the ground* (1957), and *New towns of the Middle Ages* (1967).

Visits to the British Library (formerly that of the British Museum), the Bodleian Library, Oxford, or the Public Record Office will probably be unavoidable once it is decided to go further than searching secondary or printed sources. If application is made in writing beforehand, the books, manuscripts, or maps can be made ready for the arrival of the teacher. In this way time will not be wasted and disappointment will be avoided.

There are, however, so many County Record Offices in existence now that a preliminary search should be directed to them and advice asked before undertaking journeys to the national libraries. Most of the estate plans and maps already referred to will be held here. Here also are to be found the hundreds of wills and probate inventories which provide a detailed understanding room by room of house plans and their furnishings. M W Barley has drawn extensively on this type of evidence in *The English farmhouse and cottage* (1961). His *Guide to British topographical collections* (1974) covers England and Wales on a county basis and lists the topographical drawings, prints, photographs, maps, and plans to be found in County Record Offices and libraries. Often the CRO is the place of deposit of collections of papers of the great estate-owning families. These may include deeds, terriers (lists of the landed possessions of churches), and manorial court rolls which will contain hundreds of topographical references dating from the early Middle Ages.

A school can over the years build up its own archive of documents illustrating the history and archaeology of its chosen area of study. Teachers will need to study the documents, maps, and pictures in the Record Office or library and then order photostats, Xerox copies, or (more expensively) photographs. These copying facilities are nearly always available in County Record Offices and large libraries, Teachers centres can help with the final duplication of material so that there are multiple copies for classroom use.

Place-names

Because documentary sources are scarce between AD 410 and 1066, the study of place-names assumes a great importance. Basically, the theory is that the great majority of places now recorded on modern maps received their names from people who settled in Britain during this dark period. These names referred back occasionally to Celtic or Latin names; far more frequently, however, they took their inspiration from topographical features (such as rivers or hills), from farming, or from personal names. It is not a good idea to guess at the meaning of place-names: the whole subject is full of pitfalls for the unwary amateur. The few experts in the subject have a proper understanding of the languages that were in current use when the place-name was first applied. They search out the earliest spelling of the place-name in the documentary record and its subsequent variants. The linguistic elements are then dissected and their etymology examined.

School children who are beginning to learn foreign languages and those who want to know their own better will quickly be able to learn the elements which are repeated in place-names over and over again, sometimes in slightly different dialect forms in different parts of the country. One essential book for the school library is E Ekwall s *Oxford dictionary of English place-names* (1960). The various county volumes of the *English Place-Name Society* are to be found in any good reference library.

Let us take a few examples from Northamptonshire of the sort of information place-names can give someone interested in past landscapes. Frequent references are found to vegetation in Anglo-Saxon place-names: Brampton (briar or

bramble farm), Oakley (oak clearing of wood), Boughton (beech farm), Thurning (place overgrown by thorn bushes), Brigstock (birch tree stump or *stoc).* There are 37 *-leys,* twelve *-worths,* and nine *-felds* in the county, mostly congregated in the two ancient forest areas, Rockingham in the north and Salcey and Whittlewood in the south. These last three elements all have something to do with clearing and enclosing of woodland. Our past landscapes are populated with wild animals through place-names. Again in Northamptonshire, Wolfage is a reference to an enclosure intended to keep out wolves, Cranford means the crane s or heron s ford; Everdon is wild boar hill, Brockhall means badger slope. There are many references to the beasts of the chase Hartwell (hart s spring), Bugbroke (stream of the bucks), Hargrave (hare grove) and even insects are mentioned Warkworth is spider s clearing and Stuchbury comes from the old English word meaning a midge or a gnat.

Place-names also illuminate the extent and rate of forest clearance and the progress of agrarian colonization of waste, marsh, forest, and moorland during the early Middle Ages. This can be illustrated in eastern England. When village and hamlet names ending in the Anglo-Saxon place-name element *-ley,* meaning clearing from woodland , are mapped in Cambridgeshire, a striking distribution pattern is noticed (Fig 9). Their occurrence is not widespread over the whole area but concentrates on the county borders with Huntingdonshire and Suffolk. Thus the place-name evidence suggests that these were areas of woodland in the early Dark Age. Giving credence to this theory is the fact that the three great defensive dykes which stretch across the chalkland of the county all appear to run into some now-vanished obstacle and stop short. This can hardly be other than the tract of original forest or wildwood which was left for the Anglo-Saxons to colonize. The dykes may have been attempts by local Romano-British populations to stem the incursions of the Saxons into midland England.

Place-names have been used by historians to help them in building up a picture of the chronology of settlement. Those ending in the element *-ing* were thought to mark the earliest Anglo-Saxon settlements, followed by -ton and *-ham* settlements, and then those involving the forest-clearance terms. This simplistic explanation is now discredited and another is gaining support which reckons that those ending in *-ham* are the earliest, at any rate in the Midlands and East Anglia. Before trying to sort out the situation in a chosen area, Margaret Gelling s account in the latest volume of the publications of the English Place-Name Society is recommended (*Place names in Berkshire* Part III (1976), 812-47) as a model discussion.

Air photographs

Most schools are visited from time to time by the representative of a commercial aerial photography agency who announces that his firm s plane has flown over and taken pictures. The samples he produces show the familiar (and perhaps hated!) buildings in a new light when viewed from above, and the pinhead dots of children disporting themselves in the playground can be picked out. Prints sell well. Children are thus familiar at any rate with the concept of aerial photography.

Aerial photography has been the greatest single instrument of progress in modern times in the identification of archaeological sites. Once the surface of the land has been disturbed by human or natural agency, the imprint of that disturbance remains practically for ever and will be revealed as contrasts in tone or colour on a photograph taken from the air. There are three ways in which sites are located from the air:

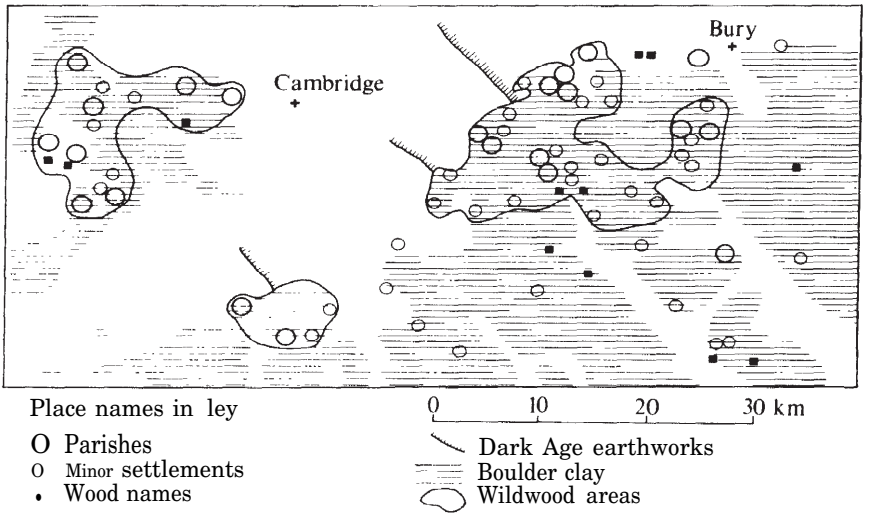


Fig 9 *Place-names ending in* -ley *in Cambridgeshire (after O Rackham).*

1 *Shadow sites.* Every child will have noticed that his shadow, much shorter than himself at noon, lengthens as the sun moves across the sky until at the end of the day it will have grown many times his height. Similarly, the banks and ditches of archaeological features, however slight, will show up from the air. They will be recognizable in the contrasts between shadows, normal even lighting, and reflected light or highlight (Fig 10). The best results will depend upon the direction and altitude of the sun. If its rays are parallel to a bank or ditch, the lighting will be even and the site will remain imperceptible. If the direction of the sun differs from that of the line of the earthwork, then the nearer the angle between the two approaches 90°, the more marked the shadow will become. Dawn or late evening are obviously the best times, when the sun is low on the horizon. Water, frost, and snow, which lie longest in the hollows of ditches or the lee side of banks, will also indicate the existence of slight earthworks.

2 *Soil-marks.* When a jumping pit is dug on the school field and filled with sand, the ground never returns to its original geological compactness. That jumping pit will be evident to future archaeologists, surveying from the air, long after the school has fallen into disrepair. Buried features in fact often show up as soil-marks on the surface and are detectable because of marked contrasts of colour. The white chalk of a now-flattened barrow mound and the dark earth of its surrounding ditch will show up magically from the air. The sites of demolished buildings show up as a contrast of tone between the mortar and clay of the building debris and the normal soil. Such marks thus reveal surface variations to the depth at which the ground is commonly disturbed by ploughing.

3 *Crop-marks.* It is a commonplace of gardening that certain crops, such as runner beans or leeks, require special preparation in the form of deep trenches

Fig 10 Shadow-marks, Great Haseley, west Oxfordshire. This site, when photographed in 1954, showed many of the classic features of deserted medieval settlements. It is the former village of North Weston. The tofts and crofts of the peasant holdings, roughly rectangular in shape and divided by boundary ditches, slope down to the hedged stream and are cut in the lower part of the photograph by the Victorian railway line. In the centre is the hollow-way of the former village street. Surrounding the peasant holdings and abutting up to the irregular dog-legged boundary ditch are the furlong blocks of ridge-and-furrow, relics of the medieval cultivation system.
Photo: Cambridge University Committee for Aerial Photography

dug down to the subsoil and filled with manure. Moisture is thus retained for long periods, and the crops flourish. A similar effect is apparent where ancient man has excavated gullies, pits, or ditches in compact subsoil or in rock. These hollows have subsequently filled with silt or earth and thus provide pockets of deeper and often richer soil. No matter how many hundreds of times the field is ploughed, these archaeological features cut into the subsoil persist and affect the crops planted above. They encourage deep root development, since moisture will be retained for quite long periods. Thus they promote an abnormal growth, differing in height and rate of ripening from the crop elsewhere (Figs 11, 12, 13). Areas over such buried archaeological features may therefore stand out as

Fig 11 Cropmarks 1 mile south-east of Fyfield, Oxfordshire, on the gravels of the Upper Thames Valley. This oblique aerial view shows in the upper part five ring ditches, a ploughed-out barrow cemetery of the Bronze Age. Gravel quarrying in the 1940s destroyed part of the site to the right. In the lower half the mesh of cropmarks indicates a multi-phasedagricultural landscape of the pre-Roman and Roman Iron Age. Pit alignments, field boundaries, stock enclosures, pit groups, and the gullies surrounding circular huts can all be disentangled. Photo: Cambridge University Committee for Aerial Photography

taller and greener amongst a ripening crop, forming what are termed positive crop-marks . Where stony features such as walls, floors, and yard surfaces lie beneath the ploughsoil, the reverse process will operate. The overlying crop, having less nourishment and moisture to draw upon, will be weak in its growth and so produce a negative crop-mark , which can be intensified by parching of the ground in a dry summer. Although growing cereals, particularly barley, are the most sensitive to moisture changes, root crops (swedes, beet, and turnips), which draw their nourishment from the topmost layers of soil, may react not only to moisture but also to the greater thickness of well drained soil. In such crops the lines of more vigorous growth may mark the position of obliterated

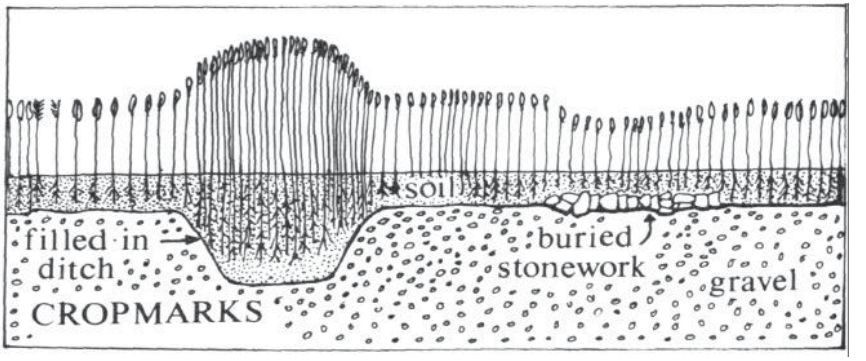


Fig 12 *Diagram showing how cropmarks are formed.*

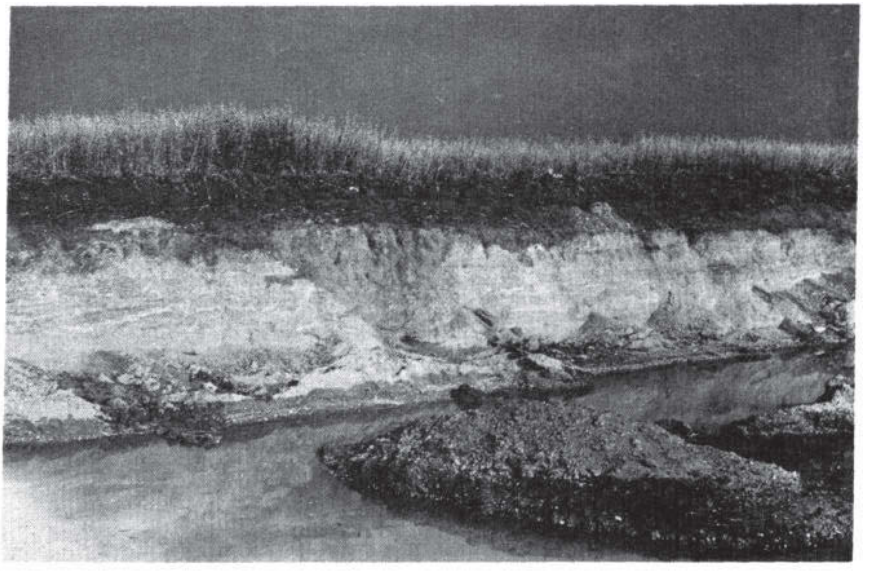


Fig 13 *This section of Allen s gravel pit, Buscot (Oxfordshire), shows a pre-Roman Iron Age ditch cut into the lighter gravel. The deeper soil in the ditch fill has caused the cereal crop above it to grow longer and greener.* *Photo: Ashmolean Museum*

ramparts, and over road causeways crossing ditches and other similar deep features the growth may be less regular and stunted, giving a blotchy marking.

There are two *main groups* of air photographs available:

1 The largest group comprises those taken for non-archaeological reasons such as the *vertical coverage* of the British Isles compiled by the Royal Air Force in the period after World War II (eg Fig 1). These are valuable in that they show the state of the landscape as it was nearly thirty years ago; comparison with recent ones will show ancient and modern features damaged by recent development. More recently, various commercial firms have undertaken further vertical photography as an aid to mapping and survey work. Often the scale of the photographs, which were generally taken at a height of about 3000m and printed at a scale close to 1:10,000, will not provide sufficient detail for many smaller sites. Areas of prehistoric fields, medieval and later ridge-and-furrow, and settlement plans might profitably be plotted from their coverage.

2 Air photographs taken for purely archaeological purposes are often *low-level oblique views* which usually reveal much detail (see Figs 10 and 11). At carefully chosen times of the year, it is common practice to fly over a site at 60-150 or 300-400m, approaching it from a number of angles to accommodate variations of relief and light. Since they are always at a larger scale than the vertical photographs of non-archaeological surveys and show features from a more recognizable angle than verticals, they are of considerable value.

Using aerial photographs

The most useful practical application of air photographs involves *plotting cropmark and earthwork sites on Ordnance Survey maps.* The 1:10,000 and 1:2500 scale maps are best suited for plotting as only they show in detail those modern features which are likely to appear on air photographs. The way to do this is to have at hand the 6in to 1 mile map, a piece of transparent plastic film to act as an overlay, and the aerial photograph. First the air photograph is orientated by matching features appearing on the photograph with those on the map. Then the archaeological features are drawn on the overlay. Differences in scale and distortions due to surface relief have to be adjusted. Low-level oblique shots, while providing a portrait of the antiquity, may make it very difficult to draw an accurate plan. It is easier if several views of the same subject are taken from different angles or heights; then the drawing of oblique lines to join field boundaries may make the correct location of the site possible.

2 *The absence of crop-marks in an area does not indicate that this area is devoid of traces of former human activity.* Soil conditions in fact affect the incidence of crop-marks and they generally will not appear where the soil and underlying strata are of similar consistency, as is the case with clay and sand. South Northamptonshire and north Oxfordshire, for instance, are virtually devoid of crop-marks owing to the boulder clay mantle over the ironstone/sandstone formations. Surface scatters of pottery and other finds, however, indicate that prehistoric and Romano-British occupation was reasonably dense.

3 *Not all visible marks represent ancient disturbances.* It is as well to be aware of the signs left by modern ploughing, cropping, and tractor patterns. Check the date of the flight which usually can be found on the margin of the picture. In some areas, local drift geological conditions, such as the crazed lines left by frost cracks or the undulations of silted-up river beds, may have resulted in natural crop-marks which can be confused with man-made features. Golf

courses seen from the air are particular hazards. A deserted golf course on the island of Lundy was taken by the unwary to be the remains of a well preserved Iron Age field system until it was properly surveyed. Every site photographed from the air should be visited on the ground and other evidence brought to bear on the problem of interpretation.

4 *The identification of various sites* appearing as earthworks or crop-marks has to be done by comparing them with other and excavated sites. Descriptions of types of site are given in a later section, but two most valuable guides which should be in every school library are the Ordnance Survey s *Field archaeology in Great Britain* (5th edn, 1973) and E S Wood s *Collin s field guide to archaeology* (3rd edn, 1972).

Sources of aerial photographs

1 There are difficulties of access to air photographs because they cannot normally be inspected for selection. The RAF national survey air photographs are now held by the Department of the Environment and enquiries for English sites should be addressed to The Air Photography Officer, Room II/4, Department of the Environment, Whitehall, London SW1; for Wales, The Air Photographs Officer, Welsh Office, Summit House, Windsor Place, Cardiff CF1 3BX; for Scotland, The Air Photograph Library, Room 016A, Scottish Development Department, York Buildings, Queen Street, Edinburgh EH2 1HY. If a description of the intended research and an indication of the types of evidence sought is included, the most relevant photographs, with due regard to height of camera, vegetation, and season, can be supplied. The sheet number of the appropriate 1in to 1 mile or 1:50,000 OS map, together with the National Grid Reference of the area for which photographs are required, should be quoted in all requests. A map-tracing showing the boundaries of the area to be studied should also be supplied for ease in relating the area to the National Grid maps held by the photographic unit.

2 *The Archaeology Division of the Ordnance Survey* at Romsey Road, Maybush, Southampton SO9 4DH, also keeps a collection of air photographs showing selected sites. The regional offices of the Survey have photographs at 1:2500 scale for map revision purposes which can normally be seen by arrangement. In recent years various government departments, local authorities, and other organizations have acquired or commissioned vertical air photographs for specific purposes and many of these collections, together with those of the commercial firms which often carry out the surveys, may usually be seen on request.

3 *The National Monuments Record* (England) at Fortress House, 23 Savile Row, London W1X 1AB, maintains a growing collection which includes many RAF, OS, and commercial air photographs as well as prints of purely archaeological photographs taken by past and present private flyers. Some museums and local archaeological societies likewise keep copies of air photographs relating to their own area or region. However, the largest and at present most important collection of archaeological air photographs is that administered by:

4 *The University of Cambridge Committee for Aerial Photography* at Mond Building, Free School Lane, Cambridge CB2 3RF, and here are photographs of large numbers of crop-mark sites as well as many fine views of earthwork sites. Whilst the collection is not normally accessible, the Committee will supply prints upon receipt of details of parish and National Grid Reference.

Oral evidence

Mention was made in the last section about the danger of confusing the marks left by modern agriculture with those imprinted on the landscape by ancient man. A way of checking the recent cultivation practice, which will shed light on the present condition of archaeological sites, is, of course, to speak with those who work the land in the course of their daily lives. Landowners, farmers, and labourers who live near and work on the land have an intimate knowledge of the fields they plough, drain, and hedge, and they may well have noticed scatters of pottery and stone and patches of dark soil, perhaps without understanding their archaeological significance. They will also be able to recall recent changes, such as the grubbing-up of hedgerow boundaries, the pulling-down of farm buildings, the filling-in of ponds, even the erasure by bulldozing of the enormous banks and ditches of an Iron Age hillfort (such as happened recently at Madmarston hill, Oxfordshire (see Fig 48)). When interviewing it is important to make a note in the logbook of the name and address of the informant, the information given, and the name of the interviewer and the date.

Planning a programme of fieldwork

Let us assume that the teacher who is interested in encouraging archaeological fieldwork in his school has now succeeded in accumulating a body of background information. He will now wish to plan a programme of work for his school and will need to choose an area for activity. The area chosen for younger children to work in will of necessity be near the school for ease of access in school hours. It is likely to be the fields worked by some friendly local farmer, or the lanes, woods, moors, or common land nearby. For secondary pupils it may well be a district deliberately chosen some way from the school because work there will give children experience of an unfamiliar and therefore more stimulating environment. It is sad to record that the difficulties of soaring transport costs may well restrict even secondary schools to the immediate locality of the school, despite their budding parent associations which provide minibuses and have a good tradition of supporting outside activities.

To help teachers to choose an area and to aid the assessment of current archaeological problems the next section surveys some of the main achievements of archaeological fieldwork (as distinct from excavation) in different physical situations, and points the way towards what still needs to be done. Seven situations have been chosen to illustrate the major types of rock, soil, and vegetation which are to be found in Britain. These are gravel, fen, chalk and limestone, clay, moorland and heath, woodland, coast and rivers. In each case a brief analysis is made of the physical features of the situation, followed by a survey of the work which has been undertaken recently and the problems still unresolved. It is hoped from this that schools will recognize the possibilities for further fieldwork in their region and will set about formulating plans for their own work.

Gravel

Over the last 5000 years the wide flood plains of gravel terrace and subsoil which flank the principal rivers of eastern England have provided easy routes for settlers moving inland from the coast after the short sea-passage from the continent of Europe. The habitation sites which they afforded, in addition to

being well drained, were easily cleared of light vegetation. There are two main reasons why archaeology has concentrated work on the gravels. First has been the response of excavation to the destruction of remains by increased quarrying activity. Secondly, and more significantly, gravel subsoil is extremely prolific in the production of crop-marks (see Fig 13). This phenomenon was first noticed by observers on the ground in the upper parts of the Thames and Nene Valleys in the 19th century. The development of archaeological air photography in the period following World War I provided a technique for the recovery of this information (see Figs 10 and 11). Much aerial reconnaissance has been extended to other river valleys only since World War II, and even then the documentation, plotting, and publication of the results have lagged behind the original discoveries. Hence it is only in recent years that comprehensive surveys have been published such as those of D Benson and D Miles *The Upper Thames Valley: an archaeological survey* of *river gravels* (1974), and R Hollowell *Aerial photography and fieldwork in the Upper Nene Valley* (1971).

These surveys present the results of aerial photography in the form of a gazetteer of crop-mark sites, and they illustrate the various features at 1:10,560 or 1:10,000 scale. Such a choice of scale does tend to limit the accuracy of the positioning of the marks; it also restricts the amount of detail which can be shown. However, it has the advantage of showing the character, extent, and density of the crop-marks. They are seen as a complex mesh of interrelated elements within archaeological landscapes. It is easy to use them to highlight the threats from development such as gravel extraction. Similarly, they can prompt recommendations for future fieldwork, excavation, and selective preservation.

On many occasions the recognition of a site from the air has been followed by some attempt at fieldwalking, but hitherto the purpose of this has often been little more than to collect material to provide some indication of the date and rough extent of a settlement. Only in a few instances, such as those where specific scatters like kiln debris and pottery wasters (the cracked and distorted fragments of pot spoiled by overtiring or bad packing in the kiln) demonstrate a centre of pottery production, has field walking made any suggestion of the function or the character of a site. This means that if the site is to be interpreted it has to be by recognizing the analogies between the aerial record and upstanding monuments or excavated sites elsewhere. Some crop-marks such as those of pit alignments and ring ditches are sufficiently distinct to do this satisfactorily. Others remain unassignable to a particular period and unclassified as to type. Indeed, excavation increasingly shows that crop-marks of similar appearance can relate to features of different date and different function. It might be helpful to describe them in largely geometric terms, such as circular/rectangular enclosure, parallel lines, etc, rather than to make unjustified assumptions about function and period. Even on a subsoil as responsive as gravel, only a percentage of features on any site will be recorded by air photography. It will often remain for fieldwork on the ground to discern the unknown elements and trace the total pattern.

Recent work in the Nene and Great Ouse valleys of Northamptonshire and Bedfordshire has shown how systematic fieldwalking can combine with the evidence of air photography to result in a more complete understanding of many sites. Collection and recording of surface material from 20 and 10m squares extended over known crop-mark sites has been carried out. From an analysis of the artefactual material it is possible not only to identify variations in the density and type of scatter, but also to reconstruct a chronological sequence of the structural development of a site. To take an example of how this has been linked

in with subsequent excavation, we can turn to Odell, in north Bedfordshire. Here the rescue excavation of a Romano-British farmstead site has allowed the results of a surface collection to be directly compared with the record below the ground surface. Buildings of late Roman date were found overlying earlier levels of occupation where formerly a stone scatter and a range of late Iron Age and Roman pottery sherds had been visible on the surface. Elsewhere at the site, concentrations of Saxon pottery may point to the position of ploughed-out settlement remains, since only deep features of the period such as timber-lined wells survived beneath the level of medieval and more recent cultivation.

The type of approach to fieldwalking advocated in this booklet is still in a stage of infancy. It emphasizes the need for more intensified techniques of data recovery to be attempted. It is well within the capacity and organization of schools to mount such operations. The accelerating rate of gravel extraction provides the incentive for such comprehensive and detailed field surveys.

Further reading

Dix, B, 1977 Excavations at Odell, Beds: A progress report, *CBA Group 9 Newsletter,* **7**

RCHM (England), 1960 *A matter of time*

———— , 1969 *Peterborough New Town: A survey of the antiquities in the areas of development*

Webster, G, & Hobley, B, 1964 Aerial reconnaissance over the Warwickshire Avon, *Archaeological Journal,* **121,** 1-22

Fen

The Fenland of eastern England affords an unrivalled opportunity to reconstruct an almost complete landscape of the Roman period. The spread of peat in the area around the Wash due to successive failures in land drainage resulted in the filling of open features and the burial of the Roman land surface. Whilst subsequent reclamation permitted the conversion of some land to arable, much remained as moist pasture well into the 18th and 19th centuries. Since then, improvements in drainage and increased cultivation have returned the old land surface to view and, following World War II, all but a few fields have been brought under the plough. In the few remaining areas of pasture, ditch lines are visible in relief owing to the sinkage of their peaty infill under recent more efficient drainage. Elsewhere ploughing reveals a contrast between the dark lines of peat fill and the light buff silts and grey-brown clays now devoid of their peat overlay. As the farming year advances, so these dark soil-marks give place to quite distinct crop-marks. Aerial photographs taken since World War II have shown the settlement pattern of the Roman Fenland with a remarkable clarity.

Many years study of the area by geographers, soil experts, and archaeologists has shown that the Romano-British population was more concerned with livestock and less with arable than had previously been thought. It has also indicated a shift in settlement away from scattered single farms at the end of the 1st century AD towards nucleation in the 2nd century. Canal systems, roads, and straight-line droveways associated with new predominantly multiple settlements suggest a possibly official large-scale planning taking advantage of increased dry conditions (Fig 1). However, drainage remained a constant problem, and the archaeological evidence indicates a gradual retreat of occupation from the lower-lying silt, particularly in the 3rd century, when

silting of the rivers towards the sea resulted in much freshwater flooding. The renewal of occupation in the 4th century was short-lived, with the Fens becoming almost deserted by the end of the succeeding century. They reverted to marsh and became the ague-ridden haunt of fish and water fowl, sought out by Anglo-Saxon hermits like St Guthlac of Crowland.

The precision of this overall picture derives in part from palaeoecological studies (especially pollen analysis of peat samples), but its main basis lies in archaeological fieldwork carried out on the coastal silt lands of south Lincolnshire and the fen edge south of the Isle of Ely.

For a preliminary overall view of the Lincolnshire settlement zone, the general pattern of canals, roads, droves, fields, and clusters of small enclosures, which were probably settlements, was sketched at a scale of 1:25,000. Other find spots of material such as those referred to in published sources held by museums or known by local workers were recorded at the same time. Part of the area originally examined was selected for detailed plotting at 1: 10,500 scale and a representative area was chosen for detailed field investigation. The survey was restricted to those fields where air photographs indicated the probability of settlements and to areas where local enquiry prompted investigation. Unsuitable ground and crop conditions were further factors limiting the coverage. The result is estimated as roughly 75% complete.

Almost all the sites investigated had been ploughed, often several times, and observations of the density of surface scatter often permitted the identification of individual sites within a larger settlement area. If there was sufficient dating material from each it suggested to what extent they were contemporary and how far successive. To determine date and status, as much material as possible was recovered from each scatter. Bones, shell, and industrial debris were collected as well as pottery and metalwork. Detailed notes recorded variations in soil and relief and related the area of supposed settlement to major natural and artificial features. Each site was positioned by offset from the nearest field edge, and in this the very precise straight lines of the plough were found most useful. All measurement whether to position a site or determine its extent was paced, with the pace-lengths carefully calibrated for each day s conditions.

The mass of data relating to over 250 domestic sites which this type of survey produced was subsequently analyzed, resulting in a revolutionary new understanding of an area of Roman Britain which had previously been regarded as of little historical interest. The fenland region is admittedly unique but there are other large areas of drained marsh and silt land such as the area between Ribble and Mersey, the Somerset levels, and the Pevensey levels where the techniques of fieldwork pioneered in the Fens could be employed with equal profit.

Further reading

Hallam, S J, 1961 Wash coastline levels since Roman times, *Antiquity,* **35,** 152-5

———— , 1964 Villages in Roman Britain: some evidence, *Antiquaries Journal* **44,** 19-32

Phillips, C W, 1951 Fenland Research Committee, in *Aspects of archaeology in Britain and beyond: Essays presented to OGS Crawford* (ed W F Grimes), 258-73

————(ed), 1970 *The Fenland in Roman times,* Royal Geographical Society Research Series, **5**

Salway, P, 1966 The Roman Fenland, in *Rural settlement in Roman Britain* (ed C Thomas), 26-7

Taylor, C C, 1973 *The Cambridgeshire landscape*

Chalk and limestone

Chalk deposits are found diagonally across England from eastern Yorkshire to Dorset and the Isle of Wight, with fingers stretching eastwards from Salisbury Plain along the North and South Downs. Limestone occurs in a roughly parallel band to the west of the main chalk deposits, from Yorkshire to Somerset. Of the two geological types, the chalk formations are the more traditionally associated with archaeological fieldwork, and the dense remains of earlier human activity surviving upon the chalk downlands as barrows, forts, field systems, and other earthworks have received much attention since the 16th century. Subsoil disturbances such as pits, gullies, and post holes are easily detectable on the chalk, so thin is the top soil, and such pioneers in archaeological technique as Pitt Rivers centred most of their excavation on the chalk. Such a prolonged interest in the rich spread of antiquities of the chalk situations led to a belief that this geological type was particularly favoured for settlement by early man, although it is now realized that the main reason for the widespread survival of earthwork sites is one of subsequent land use. Arable returns were small on the chalk before the advent of artificial fertilizers, with the result that Anglo-Saxon and medieval farmers tended to use the chalk areas for sheep farming. Many of the north-south trackways leading from the clay vales to the chalk were doubtless connected with droving such flocks and herds. Similarly, later agriculturalists only ploughed up the chalk lands during crises such as wars and grain shortages. The earthwork remains were therefore preserved better on the chalk than in the more favoured loam-soil areas, where they were ploughed out. Similarly, recent work on the clays, where a dense network of hedged fields and woods of Saxon and later farmers obscures the remains of prehistoric man, has shown that man was originally present here in some strength,

Several important studies have been extended to the chalk areas, which between them have defined large areas of previous late Iron Age and Roman landscapes that were cultivated by farmers whose numerous settlement sites were centred in the middle of the fields providing their economic base. A recent study undertaken in the Berkshire Downs (now mostly the new Oxfordshire) showed two main types of field system, the cohesive or planned and the aggregative which appeared to have grown slowly, field added to field over a long period. The shape of these fields seems to have been dictated by the ploughing techniques: cross-ploughing on the tops of the downs made for smallish square or rectangular fields; contour ploughing on the slopes produced larger rectangular shapes.

Detailed survey in the parishes of Pentridge, Cranborne, and Wimborne St Giles (Dorset) has produced an impressive map of a Celtic field group. Their distribution coincides closely with the areas of downland pasture mapped in 1811 and their survival is also linked with the degree of slope which inhibits modern destructive ploughing. Many such features, however, have been severely damaged by later cultivation and are only barely visible on air photographs.

Agrarian practices of a different kind have recently been investigated at Wharram Percy, where the Medieval Village Research Group has been carrying out a programme of excavation and survey since 1953. Wharram Percy parish is situated on the north-western edge of the chalk wolds in North Yorkshire, and during the medieval period comprised five nucleated settlements, four of which are now deserted and the fifth is shrunken or has migrated from its medieval settlement nucleus. The locations of four deserted villages are known

from the evidence of surviving earthworks and air photographs. Fieldwalking has pinpointed several pre-medieval settlements by concentrating on five kinds of surface scatter material associated with settlements and with manuring, industrial debris, chance finds, and cemeteries.

Once the material had been collected from the surface, it was analyzed according to its condition, apparent density, and geographical relationship to other known archaeological sites and features, and in this way the number of known Roman settlements in the parish has been increased from two to eight. It seems, in fact, as if the layout of the early medieval field system was to some extent determined by the previous existence of Romano-British field boundaries.

However, perhaps the most interesting observations of the fieldwalking survey are those which relate to the medieval practice of manuring. The presence of abraded sherds in a third of the total major fields of the township has been interpreted in this way. The broken pottery was thrown into middens and eventually was carted out into the fields with the manure. There is as yet no indication of the relative intensity of manuring in fields at some distance from the settlement. There was a change to pastoral farming following the desertion of Wharram Percy and no arable cultivation took place until the period of high farming in the 18th century, when much land reverted to arable, and it seems likely that those fields in the township which show signs of ridge-and-furrow cultivation received them in the medieval period. The fields which have no medieval pottery scatters were presumably manured in other ways, such as the controlled folding of animals for concentrated grazing purposes, although it is possible that they formed part of an infield-outfield system whereby the lands closest to the settlement were intensively cultivated and regularly manured, whilst those further out were cropped once in every three or four years.

The experience gained at Wharram Percy shows that every sherd counts. Using such techniques a school might well be able to work out the areas cultivated from centres of settlement during successive periods, and possibly even to demonstrate the relative intensity of such arable cultivation. To do this several modern fields would be chosen and their area measured. A preliminary reconnaissance, such as that recommended on p 63, would establish whether there are any concentrations of pottery, building debris, and other material indicating settlement. If this is ruled out the thin scatter of pottery found all over that field surface might then be collected and its volume in relation to area compared with that collected from the adjoining fields. The results could be mapped, one dot representing so many sherds and in this way a picture of earlier cultivation areas might be built up even if all trace of earthworks or ridge-and-furrow had been obliterated by later ploughing practice.

Further reading

Bowen, H C, 1961 *Ancient fields* (reprinted 1970)

Hayfield, C, 1976 *Wharram Percy Parish survey,* a lecture given at Knuston, Northants, November 1976

Rhodes, P P, 1950 The Celtic field systems on the Berkshire Downs, *Oxoniensia,* **15,** l-28

RCHM (England) 1975 *An inventory of the historical monuments in the County of Dorset:* **5,** *East Dorset*

Taylor, C C, 1975 *Fields in the English landscape*

Interim reports of the work at Wharram Percy have appeared since 1953 in the annual reports of the Medieval Village Research Group.

Clay

Over large areas of midland England the solid geological formations such as sandstones and limestones are masked by superficial deposits left by retreating ice sheets, with the result that the distribution of this so-called drift and the soils it produces is more significant in determining vegetation and subsequent land use than the underlying rocks. Earlier archaeological theory saw prehistoric man favouring the lighter soils and avoiding these heavier clay lands which were considered to have been cloaked in a dense oak-elm forest, the natural regeneration of which was only prevented by later clearance. However, recent fieldwork in some areas shows that this was a somewhat over-simplified picture.

On the boulder clay lands of north-east Northamptonshire, for example, settlement was probably well advanced by the end of the first millennium BC and became relatively widespread in the succeeding Roman phase, when farmers were exploiting large areas of land. Whether there was a reversal to forest conditions with the collapse of Roman civilization is not clear, but certainly there is little or no evidence for Anglo-Saxon settlement except in widely dispersed nucleated settlements which have survived as villages. Although the Rockingham Forest area was declared a royal hunting preserve, together with other parts of the county, in the early Middle Ages, it was thickly studded with assarts and dispersed settlements. Such isolated forest holdings and straggly settlements occurred in the Lyveden Valley, where iron smelting and pottery and tile production flourished for some 400 years until the beginning of the 16th century when sheep farming took over, imparking occurred, and the area became deserted.

The Lyveden valley is formed by a stream which winds eastwards to join the river Nene at nearby Oundle (see Fig 7). The surrounding unexciting low hills of Oxford Clay and Cornbrash fall away gradually to the north-east, their heavy Boulder Clay cappings precluding the production of crop-marks. The few air photographs taken of earthwork sites during the last twenty years demonstrate the progressive destruction of such features in the area by ploughing and indicate that much of the landscape history can now only be recovered by systematic fieldwalking and documentary research. A ten-year study of the area undertaken from 1965 onwards by the Kettering Grammar School Local History and Archaeological Society has combined such analysis with excavation at one of the key medieval sites in the area to result in a detailed understanding of the development of the valley in the Middle Ages and also to provide some indication of its earlier history (Fig 14).

As in all such studies, the totality of the overall picture is limited by various factors, among them the proportion of arable land under cultivation, the possible inability to recognize certain fabrics of prehistoric and Saxon pottery, the poor survival rate of some artefacts, the physical conditions in which fieldwalking was carried out, and, of not inconsiderable significance, the Mars Bar factor, or the distance over ploughed boulder clayland which a 12-year-old boy will walk when fortified by the consumption of some confection at the furthest point. Perhaps more restrictive was the fact that the thick undergrowth of the sometimes extensive woodland areas which occur in the valley was not explored, despite the fact that much of the woodland was secondary and therefore likely to conceal evidence of former cultivation and settlement. However, a number of the fields in the area investigated were walked in detail several times during the ten-year study period, with the result that it may perhaps be claimed that a true understanding of the pattern of occupation is beginning to emerge. For whilst the developments of pre-medieval

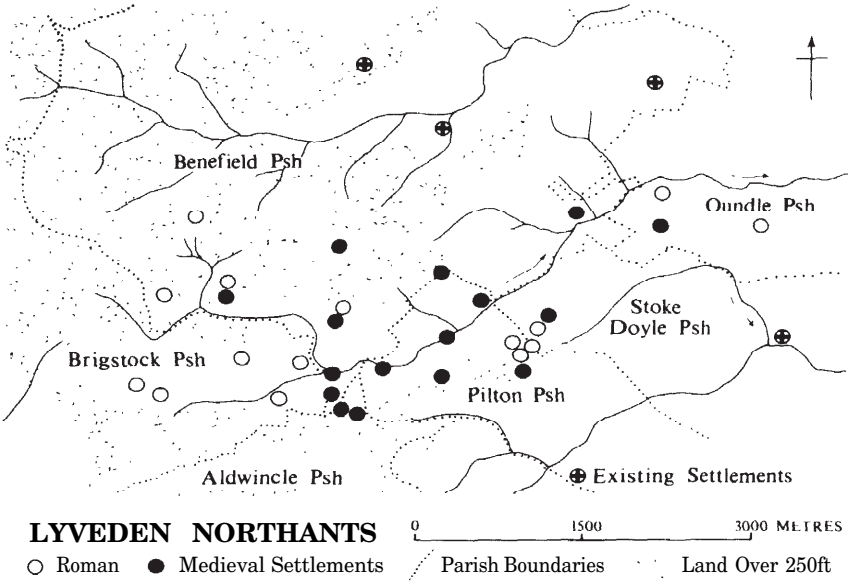


Fig 14 Lyveden (Northamptonshire)

times remain imperfectly understood and, with the exception of the Roman period, rest solely on such chance discoveries as that of a Neolithic polished stone axe-head, excavation and documentary evidence supplements the main field record for the period from the 11th century onwards.

Careful excavation at the deserted village site of Lyveden, situated approximately half-way along the valley, has indicated that iron smelting was being carried out in the 11th century and provides a context for the slag picked up on the stream banks at this point. Sherds of contemporary St Neots ware found in and around moated sites on either side of the valley also suggest a dispersed pattern of forest-edge settlement beginning at this time. Industrial activity at the main settlement site continued with the subsequent emergence of a potting industry, the surface traces of which, comprising dense concentrations of potsherds, broken kiln furniture, burned limestone, and charcoal, had originally led to the identification of the site with that of the Magna or Potteres Lyveden mentioned in 14th century documents. Further concentrations of Lyveden-type pottery recorded in isolation from the main settlement may indicate assarting from the forest. Pottery production did not, of course, necessarily involve the destruction of woodland on a large scale. Coppicing was well understood in the 13th century and there is little doubt that the surrounding woodland was managed systematically to provide the forest potters with fuel. The documentary record is sparse, and the last reference to potters at Lyveden occurs at the beginning of the 15th century, although farmers continue to be mentioned and the archaeological record shows some pottery and tile manufacture to have continued to at least the end of the century. The

final desertion of the settlement may be connected with the imparking activities of the Tresham family who acquired the manor at this time, extending their parkland at the expense of the South Field of Lyveden, where its boundary may still be seen. Towards the end of the 16th century, a great rectilinear garden was laid out overlooking the by then deserted village, and connecting the probable site of the medieval manor with a more recently constructed building. Fieldwalking showed that the pleasance overlay a small moated site which had been occupied in the 15th century. A number of spurs, stirrups, and arrowheads picked up from the ploughsoil in the area provide a reminder that hunting was but a lordly extension of the poaching practised by the medieval potters, which was found to be reflected in both the archaeological and documentary record.

The Treshams introduced stock rearing to the valley on a large scale during the 16th and 17th centuries, as evidenced by the hedgerows defining their large enclosures. By the Victorian period of high farming, these fields had been subdivided by straight stretches of single-species hedge, which contrasted quite markedly with the more species-rich older lengths. In the 1960s many of these hedges were removed in response to the demands of an increasingly mechanized arable farming, and at the same time many areas came under the plough for the first time, thereby restricting the elucidation of the development of human settlement in the area to a primarily fieldwalking approach.

Further reading

Brown, A E, & Taylor, C C, 1972 The gardens at Lyveden, Northamptonshire, *Archaeological Journal,* **129,** 154-60

Bryant, G F, & Steane, J M, 1969 Excavations at the deserted medieval settlement at Lyveden: 2nd interim report, *J Northampton Mus,* **5**

———— , 1971 Excavations at the deserted medieval settlement at Lyveden: 3rd interim report, *J Northampton Mus,* **9**

Dix, B F, 1969 Gazetteer of sites discovered to date in the Lyveden valley, in Bryant & Steane 1969, 48-50

RCHM (England), 1975 *An inventory of the Historical Monuments in the County of Northampton:* **1,** *Archaeological Sites in NE Northamptonshire*

Steane, J M, 1967 Excavations at Lyveden, 1965-67, *J Northampton Mus,* **2**

———— , 1974 *The Northamptonshire landscape*

———— , 1976 *A school s experience in fieldwork,* a lecture given at Knuston, Northants, November 1976 (to be made available in printed form by the DOE)

Steane, J M, & Bryant, G F, 1975 Excavations at the deserted medieval settlement at Lyveden: 4th report, *J Northampton Mus,* **12**

Moorland and heath

The tracts of moor and heath which occur in northern and western England and in large parts of Scotland and Wales are generally inhospitable to us today, but were not necessarily so in antiquity. These areas include high ground which might be regarded as above the level at which human occupation is possible, but former settlements have been recognized as high as 722m OD and funerary monuments have been recorded at even greater altitudes. With climatic deterioration and perhaps declining population pressure, human occupation withdrew to a lower level. Since then an undercapitalized agricultural effort,

together with the prevalence of weather-resistant stone as a building material, has resulted in a high survival rate of many field monuments in these situations (Fig 15). Although their details and distribution may be recovered by fieldwork, the moor and heathland surface is often obscured by a dense vegetation cover. Bracken, in particular, hides the evidence and can cause considerable discomfort to anyone trying to do fieldwork when it is wet or when, in the summer months, it shelters acrids. The best time for survey in bracken-infested areas is thus March or April when the fallen fronds have subsided under winter downpours and frosts. Periodic controlled burning and accidental fires will frequently clear bracken, gorse, and heather. After wind and rain have dispersed or settled the ash, an excellent opportunity is afforded to recover artefacts and investigate such surface remains as field systems marked by slight boundary banks, stone clearance heaps, religious monuments, and habitation sites.

Another problem arises out of the deep peat cover which, over the past few millennia, has blanketed much moorland with its steady growth. Human activity, including over-grazing and removal of the moorland hay, led to soil erosion and the exposure of boulders and rock outcrops. As a result of worsening weather, leaching increased, arable land high up the valleys was abandoned, and peat encroachment began to cover the remains of this former farming activity. This growth is now less active and peat has been extensively removed for fuel in some areas, but its masking effect is still widespread, with the Pennines, much of Wales, the moors of Devon and Cornwall, and many parts of Scotland being seriously affected. All disturbances of these deposits should be observed for any archaeological feature and objects which they might reveal.

Although pollen analysis is likely to be beyond the capacity of schools to practise, it should be emphasized that where anaerobic (oxygen excluded) conditions prevail, organic materials such as pollen and the other vegetable remains forming the peat can yield data on the development of local vegetation. Core sampling of peat deposits is undertaken and the results are analyzed to establish past local environmental conditions; these are invaluable as a means of relative dating and, when linked to the results of archaeological fieldwork, can provide a detailed record of former settlement history.

Two examples may be given which illustrate the inextricably interwoven nature of the palaeo-environmental and archaeological records. On Dartmoor, pollen and soil studies have combined with the field archaeological record to indicate that marginal Mesolithic clearance of an original oak forest cover was greatly increased by a sizeable population increase during the 3rd and early 2nd millennia BC. The result was to create stretches of open country where grazing prevented regeneration of the woodland and rain leached the unprotected soils to their present impoverished state. In north Derbyshire, on the other hand, similar analyses have shown that clearance remained only small-scale and temporary throughout the Neolithic and Bronze Ages and did not become extensive until the presence of an increased and less nomadic population in the area towards the end of the 1st millennium BC. Although there are differences in the time-scale of the events in the two regions, the disastrous effects of prehistoric man s activities are broadly similar in both.

Very little systematic fieldwork has yet been attempted in the highland zone of Britain. Schools which are sited near moorland can do much to map field systems whose boundary banks lie under bracken and peat. Children can be encouraged to explore areas, freed of surface vegetation by burning, for artefacts and the remains of settlement. By kicking molehills and investigating cow scrapes they can pick up surface objects. Any collection of material should be recorded with as much care as when it takes place in lowland fields.

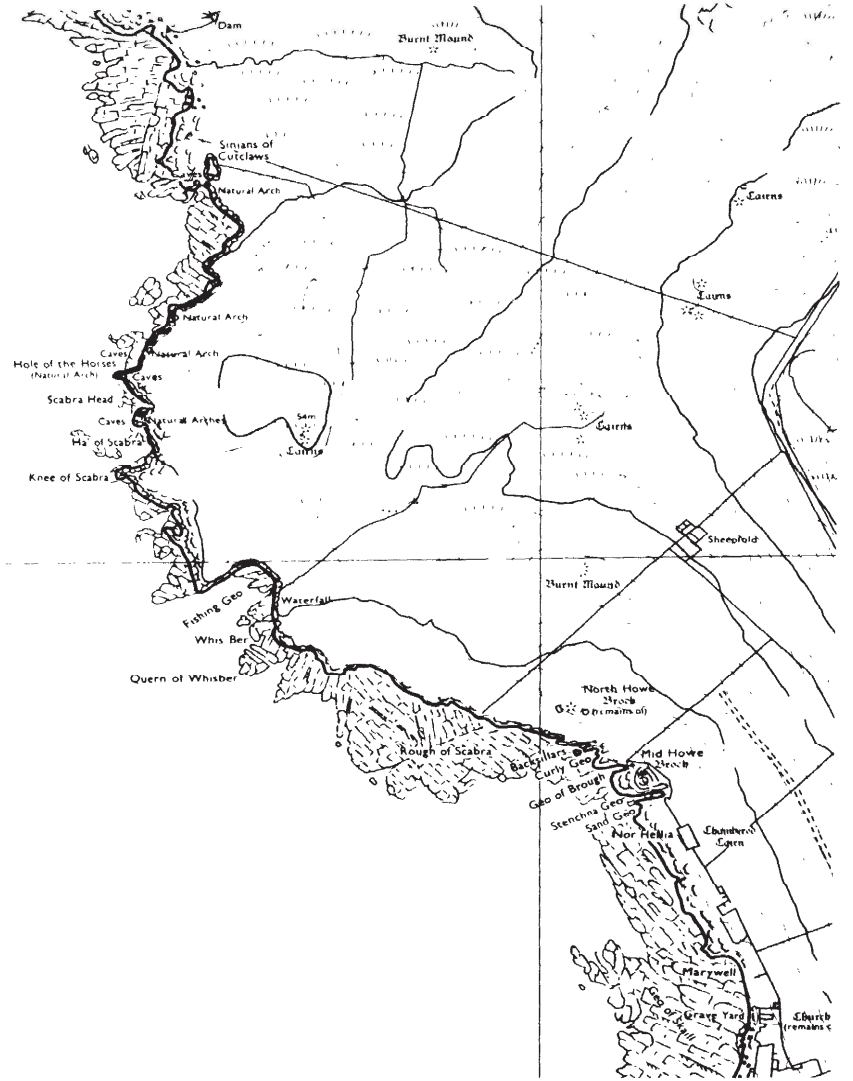


Fig 15 *This section of the most recent edition (1977) of the 1:10,000 OS map (slightly reduced in reproduction) shows part of the south-western coast of the Island of Rousay, Orkney. An undercapitalized agricultural effort over the last 3000 years, together with the prevalence of weather-resistant stone, has resulted in a high survival rate of prehistoric field monuments. Childe demonstrated how the distribution of chambered tombs on Rousay coincided with the units of arable land, one collective tomb being found in each unit. The place-names indicate the intensive Scandinavian settlement of the Orkneys. The long straight field walls date from the 19th century attempt to improve the grazing potential of the island. The deserted settlement of Marywell is in the southern portion.* *Photo: Crown Copyright*

Further reading

Dimbleby, G W, 1962 *The development of British heathlands and their soils,* Oxford Forestry Memoirs, **23**
Godwin, H, 1975 *The history of the British flora,* 2 edn
Hides, S P, 1972 The impact of man on the east moor of Derbyshire from Mesolithic times, *Archaeological Journal,* **129,** 1-21
Simmons, I G, 1969 Environment and early man on Dartmoor, Devon, England, *Proc Prehist Soc,* **35,** 203-19
Walker, D, & West, R G (eds), 1970 *Studies in the vegetational history of the British Isles*

Woodland

Although Britain is one of the least wooded countries of north-western Europe, it remains quite rich in the exceptionally large number of hedgerow trees and the myriads of small scraps of woodland, coverts, shelter-belts, coppices, and more regular plantations which occur in its countryside. Such woodland can be divided into three main types. There are plantations of trees which are nearly all of one age and often of the same species, and which contrast with those more mixed woods wherein an often rich variety of trees occur, some of which may originally have been planted whilst others have grown up by natural regeneration. There are also other areas such as parks, hedgerows, and commons where different land uses like the breeding of deer for hunting, the cultivation of arable land, and the grazing of domesticated animals have been considered more important than the trees. All such wooded areas, however, contain features of interest to the field archaeologist, yet have so often, until recently, been dismissed as impenetrable.

The recent advances in pollen analysis have done much to dispel the myth that vast tracts of land remained covered by forest in the early Saxon period, and indicate that considerable clearance had taken place in prehistoric and Roman times. The impact of the Saxon farmer upon the woodland areas was therefore relatively minimal, with the result that many of our modern woods, albeit merely scraps of the original tree cover, have survived comparatively intact since at least the early Middle Ages. Yet, whilst many have increased in size, they often encapsulate within their bounds relics of medieval woodland and deer parks (see Figs 6, 7). By mapping place-names (see Fig 9) it is possible to reconstruct some of these areas, which will often lie on inferior farmland or in remote places on parish boundaries. In midland England, for example, woodland is often grouped in areas of former royal forest, occupying soils which were suitable for little else than growing trees.

Forestry takes advantage of the natural propensity of many trees to propagate themselves not merely by seed but also by coppicing and suckering. When trees such as maple and wych elm are cut down, their stumps send up shoots and thereby become stools. On the other hand, when aspen and mast elm are cut, their stumps die whilst the root-systems generate successive crops of poles which might be harvested at fairly regular intervals. Such coppices have been identified from their surrounding earthwork banks, which were designed to protect the young shoots from grazing animals. However, grazing was permitted where the trees were pollarded or cut at a height of several metres from the ground, and such pollards thus became common in parks which contained large areas of pasture or lawns wherein stocks of deer and other animals were kept. The livestock was often prevented from straying by the

provision of a surrounding earthwork comprising a ditch and an outer bank, which might be surmounted by some sort of paling. Occasional gaps in the circuit would be matched by pits or hollows inside the boundary line to enable deer to enter, but not leave, the park, and might often survive as substantial earthwork traces. Their evidence can be linked with supporting historical studies to identify the position and extent of the parks which became so distinctive a feature of the medieval landscape from the 12th century onwards. Medieval parks might also be distinguished from later woodland areas by their richer trees and lichen content, for, whereas a piece of average coppice woodland will have between 40 and 50 species of lichen in it, 188 have been recorded in Boconnoc Park (Cornwall) and 170 in the medieval Melbury Park (Dorset). Primary woodland will similarly contain a richer flora than a recently established wood, having inherited species from the original wildwood, and might be the habitat of the oxlip, wild service, and herb paris as well as of other plants which do not readily cross open ploughed land. In contrast, secondary woodland, comprising land which has been cleared and subsequently planted with trees, will usually contain a less developed flora, although recent studies suggest that a 5-80 ha wood with twenty native trees and shrubs and some 150 flowering-plant species may be at least 400 years old. Secondary woodland, however, may frequently overlie earlier features as at Ashdown Park (Oxon), where the remains of a network of Celtic fields run up to the edge of a medieval park and continue beneath its tree canopy. Such areas will therefore often constitute the best preserved part of former landscapes which have elsewhere been eroded by the plough.

Archaeological work in woodland for schools can involve mapping the former traces of cultivation and settlement which underlie secondary woodland. Earthworks such as boundary banks and ditch systems connected with woodland and park management can be disentangled and planned. Children can be encouraged to take species counts at intervals to ascertain whether the different parts of woodland are primary or secondary. They can take measurements of the girths of ancient trees and count annual rings of felled trees to ascertain their age. The signs of former coppicing and charcoal burning can be noted. On the slopes of Blorenge near Abergavenny (Gwent) clearings are still to be seen covered with a deep layer of ash from the fires of the charcoal burners. Mementoes of hunting in former woodland such as arrowheads, deer spears, and spurs can occasionally be picked up.

Further reading

Beresford, M W, 1957 *History on the ground*

Cantor, L M, 1972 The medieval parks of Leicestershire, *Trans Leics Archaeol Hist Soc,* **46,** 9-24

Rackham, O, 1976 *Trees and woodland in the British landscape*

Shirley, E P, 1867 *Some account of English deer parks*

Steane, J M, 1973 The forests of Northamptonshire in the early Middle Ages, *Northamptonshire Past & Present,* **5,** (1), 7-17

———, 1975 The medieval parks of Northamptonshire, *Northamptonshire Past & Present,* **5,** (3), 211-33

Wilson, J D, 1971 The medieval deer-parks of Dorset, part 10, *Proc Dorset Natur Hist Archaeol Soc,* **92,** 205-11, the latest in a continuing series

The sea coast and rivers

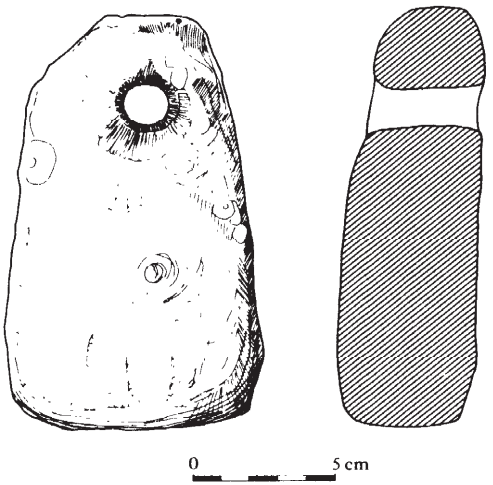
The sea coast offers dramatic demonstrations of the ever-changing nature of the landscape and also gives opportunities for fieldwork similar to those presented by quarries (see Fig 13). Along many stretches of the coast the sea has cut back rock strata with its top-soil capping, exposing man s disturbance of the surface in the form of pits, ditches, wells, and buildings. In other places the unstratified remains of human occupation lie at the foot of cliffs, mingled with shingle, silt, or mud. Elsewhere the coast has retreated inland, either because of slow-moving geological processes, or because generations of farmers have painfully reclaimed coastal marshes.

Mesolithic man originally hunted and fished the area of flattish land between Denmark and these islands, now covered by the North Sea. His implements have been found in the peat trawled up from the sea bottom by fishermen s trawls. This area was flooded by a rise in sea levels which followed the melting of the Pleistocene ice. The isolation of Britain from the continent and the draining of such river valleys as the Clyde, Humber, and Thames took place *c* 6000 BC. With this began the gradual rise of the western part of the British Isles, relieved from the great weight of ice. The post-glacial shore of the Western Grampians in Scotland has been uplifted to a maximum of 15m OD since its formation, and the process is still going on at a rate of 2-3mm a year. Conversely, on the eastern coast tilting has been going on the other way and here the sea is eroding back the coastline. The long tubular boring of a medieval well with a black organic fill became visible in section recently in the chalk cliff below Belle Tout lighthouse near Eastbourne (Sussex). The walls and stone-littered ditch sections of the Roman fort of the Saxon Shore protrude from the north Kent coast at Reculver. The Romano-British temple set on the cliff at Jordan Hill (Dorset) has been sectioned by the sea. The sea now covers most of the medieval town of Dunwich (Suffolk). It seems that it has nibbled away about a quarter of a mile in the four hundred years since 1587. All Saints, the last of Dunwich s medieval parish churches, tumbled down to the beach in this century. The beach lies littered with the detritus of this sea-wracked site.

Sand dunes and beaches are as likely as fields to contain remains of man s fugitive presence. Mesolithic tools lie scattered on sandy beaches, evidence of their owners search for shellfish and the herds of herbivores which moved to the coast to feed on seaweed and the maritime pastures when herbage was in short supply during winters. At times settlement sites were covered with drifting sand. Skara Brae, perhaps the best preserved and certainly the most well known Neolithic habitation site in the British Isles, was covered by sand drifting in towards the Orkney coast.

As one walks along the shore of any stormy coast one cannot help noticing the debris of wrecks, and storms are continually cutting back and exposing new remains. Glass, coins, and metalwork are there for collecting and recording as carefully as similar material found in fields, though the sea is likely to have moved them much further from their original place of deposition than the plough. Even the money dropped from the pockets of careless picnickers is archaeological evidence for that comparatively new phenomenon, the seaside holiday.

In other parts of the coast the land has been gaining at the expense of the sea. Along the coasts of Sussex and Kent, the Cinque Ports Rye and Winchelsea, formerly flourishing providers of ships for the royal wars against the French in the 14th century, have now been left far inland by their silted havens. As the



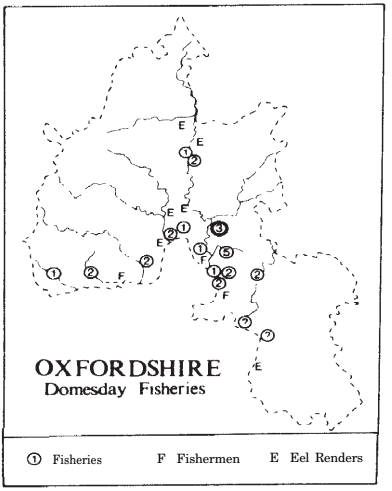


Fig 16 A medieval fishnet sinker found on the bank having been dredged from the river Cherwell at the site ringed heavily on the map. Here according to Domesday Book (1086) there were three fisheries. This is an instance of fieldwork and documents combining to throw light on the economic history of an area.

sea receded, large-scale reclamation of the salt sea marshes in Romney Marsh on the borders of Kent and Sussex was carried out by the monastic landlords of Battle Abbey in the 12th and 13th centuries. Similarly, around the rim of the Wash in Lincolnshire and Cambridgeshire are the mighty sinuous banks and remains of sluices, works connected with early medieval attempts at winning land from the sea. Their success may be judged by the magnificent fen-edge churches, built with the wealth flowing from these impressive feats of civil engineering.

A further source of wealth from the sea which can be traced by fieldwalking along the coast was salt making. Salt was won by evaporation from seawater in prehistoric and early Roman times. The methods involved boiling down salt-enriched water and the sites are found at the inland tidal limits of seawater creeks, as close as possible to the peat which was the fuel used in the evaporation process. The salters working places are often marked by low, extensive mounds of earth and broken clay objects including handbricks used to support clay troughs over fires. Other clay objects include moulds for casting salt into blocks. Such salterns, as they are called, are dated by associated pottery.

No systematic archaeological survey has ever been made of the sea coast. Schools situated near the sea might well be encouraged to make a start.

Two further areas of fieldwork are estuaries and river banks. Mudlarking

along river estuaries with their ever-changing banks of silt and sand produces a multi-period range of flotsam and jetsam. Along the southern banks of the Humber, for instance, in the last few years a remarkable collection of medieval jugs and post-medieval pottery and bottles has been picked up. These were doubtless dropped from the hands of the careless cargo handlers of Hull and the other smaller ports along the estuary. Strong tides are continually exposing new seams of finds as they scour the mud.

Fords, bridges, and the sites of ferries are also rich quarries for archaeological material because objects dropped or thrown by passers-by, even breakable ones like bottles and containers, sink into the ooze at these points and can be picked out of the mud. The dredging of rivers and streams leaves mounds of material to be sorted over by the schoolchild. Humble objects of everyday use such as stone fish sinkers (Fig 16) may mark the site of medieval fisheries recorded in Domesday book. Dredging operations at fords and locks of the River Thames have yielded magnificent artefacts of prehistoric metalwork. Swords, shields, and spearheads were obviously deliberately cast into the waters by their owners, intent on appeasing some river god. As the course of a great river, like the Thames or Trent, shifts, it cuts into the bank exposing human occupation in just the same way as quarrying.

Further reading

Salzman, L F, 1910 The inning of the Pevensey levels, *Sussex Archaeological Collections,* **53**

Evans, J G, 1975 *The environment of early man in the British Isles*

Whitwell, J B, 1970 *Roman Lincolnshire (History of Lincolnshire,* Vol 2)

Scarfe, N, 1972 *The Suffolk landscape*

Carrying out fieldwork

The teacher should now be in a position to assess what needs to be done in the area around the school. Archaeological fieldwork can be organized in class time, perhaps as part of an integrated studies scheme of work in the third year, or perhaps as part of an archaeological scheme of work aiming towards the Certificate of Secondary Education examinations. The most fruitful long-term research programmes that schools have engaged in have usually been centred on the *voluntary out-of-classroom school club or society.* This can offer an exciting hobby to children across the age and ability range. It can undertake expeditions to other archaeological sites, visits to excavations, guided tours to Ancient Monuments in the Guardianship of the State, journeys to listen to lectures, and visits to museums. These activities all help to dispel a myopic obsession with one s own small area. The headteacher might well be persuaded that the school should join the county archaeological society as an institutional member. To keep in touch with national or international developments the school library could well take a journal such as *Current Archaeology* (a popular and well illustrated account of recent work, issued several times annually). The school could also join the *Council for British Archaeology,* which provides a number of services, including a valuable Calendar of excavations, issued nine times a year. These can provide information about archaeological events, and older pupils may get to hear about opportunities for gaining digging experience under the direction of seasoned professionals. Our interest in archaeology was originally fostered by being able to read back numbers of *Antiquity* (with much exciting news from world-wide archaeology), which was available in the staffroom

library. Other periodicals, a subscription to which might be provided by departmental or library budgets, are the *Proceedings of the Prehistoric Society* (the leading national journal on prehistoric archaeology), *Britannia* (covering current Romano-British studies), *Medieval Archaeology,* and *Post-Medieval Archaeology* (similar to *Britannia* in format but for the Anglo-Saxon, medieval, and post-medieval periods). By consulting these periodicals regularly the school society can appreciate the problems which interest modern archaeologists. The members will be able to fit their chosen study area into the wider context of the county or region.

It is now proposed to set out in order practical hints as to how fieldwork might be organized in schools. A few suggestions have already been made in passing when the information-gathering stage was being described. These included keeping a watch on rock and soil exposures during cuttings for service trenches, visiting quarries, and gathering botanical data. Even for these simple tasks certain equipment will be needed. Access to the land will require to be negotiated. Records will have to be made.

When a more ambitious research programme is undertaken covering several fields or a complex of earthworks, these techniques will need to be systematized. The section which follows has been forged out on the anvil of experience of running a school archaeological society for twelve years. Everything suggested has been tried and has been adapted until it works.

Equipment and recording

1 *Maps* are obviously vital to all stages of the work, and a complete coverage should include maps at various scales (see pp 14-23 above). It is suggested that for work in the field a provision of one copy of the 2ˆ in to 1 mile sheet (1:25,000) per three children is a reasonable outlay. These are protected from wear and weather by plastic wallets. Two copies of the relevant 6in to 1 mile (1:10,000) sheets should be purchased, one to be kept at school as a master copy, on which the information gathered in the field is transcribed, and one to be kept by the teacher for use in the field. This can be carried in a cardboard container with plastic covers.

2 *Logbook* Recording should always be carried out in the field and a notebook of A4 size, with alternate scaled and ruled pages, is convenient for both written entries and drawings. It should be plastic-covered for durability and clips can be used to secure the pages in inclement weather. Entries should record in detail *all* the fieldworkers activities, visits, and observations. First on each occasion the names of those taking part should be registered: this encourages a sense of teamwork, but it also provides a check upon the accuracy of observations and enables points of research to be discussed with individual members of the team, The logbook should also contain relevant sketch plans and other field drawings, as well as detailed records of the results and jottings expressing current thoughts and ideas. It need not be an entirely dry and humourless record but can very well include occasional reference to the human side of the project. Indeed, it is surprising how much detail can be recalled when, years after the event, there is a reminder of how on a February afternoon in 1967 a group of schoolboy fieldwalkers sank into the boulder clay slurry of a Northamptonshire hillside, leaving behind two wellington boots, sizes 7 and 9, at grid reference SP 980854! Or when a plump member of the same fieldwalking group fell into a stream and was aided by his headmaster, who in turn became so immersed that water filled his wellington boots, to the great delight of the other members of the team guffawing high and dry on the

adjacent bank. Since the records written in the logbook will form the basis of all subsequent discussion and interpretation, they should be legibly written with a ballpoint pen (which, unlike ink, does not run). Several ballpoint pens should therefore be included in the stationery, as well as a range of lead pencils and rubbers. A set of coloured pencils can be useful when there are a variety of features to be recorded.

3 *Surveying equipment* For simple surveying two 30m plastic-coated tapes, and perhaps also a 20m one, will normally be required, as well as a shorter hand-tape. The drawn record should be made on a firm base such as a suitably sized board of Formica or hardboard, This may be covered with graph paper, an overlay of tracing film being attached by means of masking tape. Drawing pins are not recommended since when one is working out of doors wind manages to get under paper held by drawing pins and it tears. Surveyors arrows can cheaply be made in the school workshop from thick wire, suitably twisted at one end in the form of a ring which can be used to attach small white plastic tags, useful for quick location in a large green or brown field. Ranging or sighting poles can similarly be home-made and painted orange or red and white in equal metric divisions. They can be used as scales when photographing sites, but their principal use in surveying is to sight on them. A bundle of canes will need to be carried to use when setting up grids. More elaborate surveying equipment will generally only be required for specific exercises. Again, a plane table might be made in the school workshop. A prismatic compass should be available as part of the equipment of the geography department.

4 *Photography* A camera is indispensable both as a memory-aid and means of recording and to provide illustrative material for eventual publication and for teaching purposes. Some expression of scale should be included in every view. With earthworks it helps to have a human (not more than one that would be too distracting!) standing holding a ranging-pole at the bottom or the edge of the ditch to give an idea of scale. Photographs can be duplicated in black-and-white negative and colour-reversal film. It is suggested that one camera per group, in the hands of a specialist, is a better idea than a swarm of photographers, each duplicating the work of the others. The specialist will undertake to produce as many copies/prints from the best negatives as the other members of the group require.

5 *Finds bags* Finds are best collected in polythene bags, which may be economically bought in bulk from a wholesaler, They either may be self-sealing or can be secured with wire ties. The provenance of the material they contain should be adequately recorded in waterproof ink either on the outside of the bag or on a plastic (not a paper) tag placed within it. It is often convenient to prepare these beforehand. Paper bags disintegrate when damp and are therefore suitable for no more than short-term storage. Small cardboard or plastic boxes, lined with acid-free tissue paper, are useful for storing smaller objects such as corroded metal and coins, which must be protected from rubbing against other finds.

6 *Clothing* Over the seasons, the teacher will soon discover which items of clothing are essential and which to advise the group to leave at home. Archaeological fieldwork can be an arduous, damp, and cold business. Warm protective clothing, such as an anorak or cagoule, covering two pullovers and two pairs of trousers, a woollen hat or balaclava which can be prevented from becoming sodden by being encased in the hood of the cagoule, as well as wellingtons or walking boots, will therefore become *de rigeur*.

7 *Food* Over the years experience has shown that the most useful forms

Fig 17 (Left) How not to fieldwalk: the boy is encumbered with unnecessary impedimenta. (Right) How to fieldwalk: the girl is suitably equipped with a bundle of canes with which she will mark individual finds during the reconnaissance and a bag for the finds she will pick up in the square that has been allotted to her.

of refreshment taken on fieldwalking expeditions were of two kinds. A stock of concentrated chocolate confectionery (Mars Bars), when distributed at the furthest point of the expedition, improved morale and revived flagging energies. A hot cup of tea or soup was also found invaluable at the end of a cold afternoon s walking. Such refreshment as the latter is best kept at a temporary base or source of transport, since lunch bags and similar clutter rapidly become a tedious encumbrance.

8 A warning about *metal detectors.* Untold damage has been done to archaeological sites by the dubious practice of metal detecting by electronic gadgetry. Collecting instincts and sometimes greed for making easy money have been exploited by commercial purveyors of these instruments. The mass medis, by advertising spectacular finds such as the Water Newton silver bowls, encourage irresponsible people to trample over other people s land, trespassing for treasure. We talked recently to the curator of a Roman villa site which is in the Guardianship of the Department of the Environment. He finds he has to protect his site from almost weekly depredations by treasure hunters, who speed

around the countryside in Land Rovers, riddling such sites with their holes. Even museums and national institutions have not been free from the taint of encouraging such piratical activities in the search for coins and medals. It cannot be too firmly emphasized that to rip a find such as a coin or brooch out of the archaeological deposit in which it lies below the surface is to destroy a unique and unrepeatable piece of our history. The nests of rare birds and the habitats of scarce plants are justly given legal protection from wanton damage done by vandals and ruthless collectors. So archaeological sites need protecting by every right-minded schoolchild who, we hope, will grow up to be the conservation-conscious citizen of tomorrow. There are harmless places where people can indulge their hobby of treasure-hunting; raking over archaeological spoil heaps, rubbish tips, estuaries, and river banks does no damage. Fortunately the government is aware of the danger and new legislation is being prepared to control this threat to our national archaeological heritage.

In general it is advisable to keep the carrying of equipment to a minimum. One can never predict the weight of finds to be carried back to school as the result of an expedition. If boys and girls are cluttered up with binoculars, cameras, food bags, sticks, and other impedimenta, not only will their progress be slowed down and their interests diverted, but they will also be unable to offer a hand for tranporting a heavy carved stone or a bulky bag of pottery fragments back to base (Figs 17a and b).

Access

Before entering the field it is essential for the school to obtain permission from the landowner or tenant. Here the headteacher s help should be mobilized. He can seek for the necessary introduction with the aura and reputation of the school behind him in his negotiation. This will ease the way for the teacher to meet the farmer and then explain courteously, and in full detail, the aims and methods of the fieldwork programme. Difficulties in ascertaining the identity of farmers can be solved in one of four ways. The simplest is to ask locals sitting round the bar of the village pub. A visit to the local constabulary will maybe suffice. If these suggested approaches draw a blank, a telephone call to the regional office of the National Farmers Union will probably help. Finally, the larger estates may well be represented by the Country Landowners Association. Large estates, though apparently hostile and embattled with lodge gates, patrolled by gamekeepers, and given over to the sporting proclivities of the rich, have in our experience been uniformly gracious and accorded willing permission to school-inspired archaeological fieldwork. Complimentary copies of maps, reports, and publications should, when completed, of course, be sent to the people who allow access to their land. *Once permission has been given, and the fieldwork started, the normal rules of the countryside must be obeyed.*

Earthwork remains and their recording

Whenever an earthwork site has been located by aerial photography or by studying maps, or perhaps has shown up in conjunction with a surface scatter of pottery and stone, the first essential is to make some sort of plan. There are three reasons for this:

1 If the earthwork is subsequently destroyed, this plan may be the *only surviving evidence* for its former existence. Thus we are grateful for the drawings which the antiquary, William Stukeley made of the stone circles and avenues at Avebury (Wiltshire) between 1720 and 1724 because they

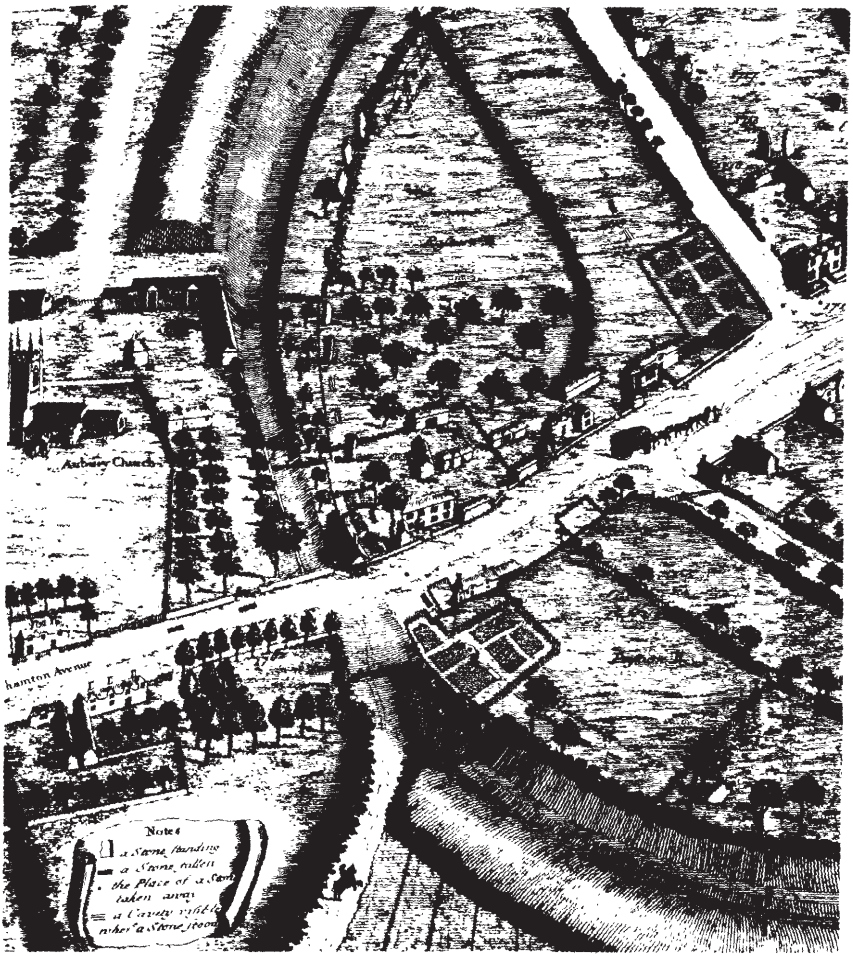


Fig 18 The Ground plot of the British temple now in the town of Aubury, Wilts, Anno 1724. William Stukeley, perhaps the greatest British antiquary of the 18th century, recorded the Neolithic henge religious monument of Avebury 250 years ago. Many of the stones he recorded have either been moved or broken up. The engraving illustrates the importance of recording field monuments now so that future archaeologists can have accurate statements before further destruction takes place.

enable us to reconstruct the former appearance of this now much damaged monument (Fig 18).

2 By comparing the plan so gained with published plans of similar sites we may well be helped to *identify the type of the monument* and proceed to interpret its multiple features. In any case, such a plan is vitally

necessary to enable later workers perhaps to interpret or reinterpret a site which the original fieldworker misunderstood.

3 It is useless to draw the plan at home: *observations must be made, and the plan drawn, in the field.* By being involved in making the plan, children are bound to give concentrated attention to the earthworks. Discussion about the function of the site will be promoted by the holders of ranging-poles, and the runners with tape-measures. The plan will gradually emerge as a tangible result of team effort.

Whether one s class or group are going to make a sketch plan or an accurately measured survey, there are preliminaries to be gone through which are common to both.

1 It is necessary first of all to walk round the earthwork, getting to know its bounds and physical features. These may extend over several fields and so it is worth looking over hedges, because different ploughing practice may have reduced and levelled the upstanding features of the site in one field while they may be well preserved in the next. Sometimes barrows are obscured by trees and undergrowth; farmers have over the years allowed this to happen because the mound was of no other economic use.

2 If it is a habitation site, it is worth while seeking the source of water supply.

3 The context of the earthwork needs to be studied. Has it been dropped in at a comparatively late state, perhaps on top of or disturbing features already present? Pitt Rivers found out when excavating at Cissbury (Sussex) that the Iron Age hillfort cut through a group of Neolithic flint mines, the filled shafts of which were found both inside and outside the fort. Alternatively, it may be one of the earliest features of the landscape, to which all subsequent boundaries, hedgerows, ditches, roads, and properties will have adapted themselves. Such is the Roman road which runs over the Wiltshire open downland between the East Wansdyke and Bath; it was almost certainly one of the first features to appear in this area and it is eminently feasible that it should have served as a boundary from the start.

4 Next, it is worthwhile enquiring of local inhabitants the name (if any) given to the earthwork, and the surrounding field names. These may, of course, relate to local (and unfounded) traditions. Again, Pitt Rivers found that an earthwork called Caesar s Camp proved on excavation to be Norman in date.

5 The plan needs to be accurately tied into the National Grid by a six-figure map reference. The scale will need to be added.

If time is pressing, or if one wants to gain a general impression with the idea of returning later to give it fuller treatment, a *sketch plan,* in which the earthworks are roughly sketched and measurements added by pacing, may provide an interim record. It will be useful to make notes of the feature s relationship to upstanding buildings, walls, and other more or less permanent features of the modern landscape which will appear on large-scale OS maps. Trees are not good features to relate a site to because of the possibilities (probabilities if they are elm or beech) of their being felled at short notice. A compass may be found useful in orienting the plan. Reference should be made (and written on the sketch plan) to the method of measurement used. Many earthwork sites on the chalk downs of southern England have been recorded by pacing. Obviously this method has difficulties when used by children with different leg lengths. The only way round it is for each child walker to check the length of his pace by walking along a measured distance beforehand. If this is repeated over various slopes and types of ground and checked with the tape a number of pace factors (Atkinson s phrase) can be found by which paces

can be converted into metres. All measurements should be in metric.

A more satisfactory method of recording an earthwork is to *make an accurately surveyed plan* of it (Fig 19). The choice of scale is important and is best settled by initially walking over a site to get a general idea of its extent. The most appropriate scale for surveying a relatively small set of earthworks like those of a shrunken medieval site is 1:1000, although for a single feature such as a moat, windmill mound, dovecot, mill, or house platform 1:500 is preferable. For large earthworks such as hillforts, which are likely to have already attracted the attention of the OS, a smaller scale such as 1:2500 is more suitable. A scale of 1:500 will permit an accuracy of measurement to within 0.5m. The exact edges of a feature on many earthworks will be difficult to define, as, for example, the point where a low bank begins to dip or where a gentle slope ends.

The basic principle of simple earthwork surveying is to establish the angular and linear relationships between the two points. In practice only 90° and 45° angles are required since all that is necessary is a line laid out at right-angles from a known fixed point on an existing line.

1 Initially a base-line must be laid out in such a position that all points of the earthwork can be seen from it. In order that the base-line may be established as a straight line, two ranging poles should be set up 10m apart, and a third sighted into position along the line which they make at a distance of 20m to give an overall measurement of 30m (Fig 20).

2 A right-angle may be subtended from the base-line by constructing with tape measurement a triangle whose sides are in the proportion 3 : 4 : 5 which, by Pythagoras s Theorem, makes one angle of the triangle a right-angle. A point at 10m can then be sighted along the 90° axis by measurement through the newly fixed point. An alternative would be to construct a right-angled triangle with two equal sides of 10m and a hypotenuse of 14.14m (Fig 21).

3 The fourth point of the square, lying diagonally opposite the right-angle previously established, can be laid out by the same method or, more simply, be fixed by tape measurement from the other two points, each 10m away. A check should be run to the point opposite, which should be 14.14m away.

4 The exercise can be repeated to result in the extension over the site of a grid of 10m squares (Fig 22).

5 The details of the earthwork, such as the tops of banks, the breaks of slope, and the bottoms of ditches, can now be plotted by offset measurement at right-angles to the main base-line and the secondary bases connecting the points of the grid. A free tape, held firmly at the point to be measured, will be at right-angles to the fixed base-line at the shortest distance at which it bisects that line. Such measurements should be taken at regular or appropriate intervals along the base-lines, with particular consideration given to keeping the tapes taut and horizontal in order to avoid the inaccuracies which sagging can cause (Fig 23).

The points so measured should be transferred to the drawing board as soon as possible, preferably in the field. Whilst graph paper should be fixed to the board, the plotted drawing should be made on an overlay of tracing paper or transparent plastic film such as Kodatrace or Permatrace, which can be used. during rain and which will not shrink, as paper does, during subsequent storage. The drawing surface should be kept clean and securely taped to the board as a protection against wind lift.

When the scale of the drawing has been chosen, the fixed points should be accurately drawn in and from them all subsequent points plotted, with underlying graph paper providing a guide. The points should be joined together in smooth continuous lines and hachures added to indicate the direction and fall of the

slopes. The head of the hachure should always represent the top of the slope, with its tail pointing downhill. Variation in the shape of the head may be used to indicate variation in the abruptness of the break of slope—a rounded head perhaps showing a gradual change and an angular flat-topped head representing a sharply defined break. Hachures close together should indicate a steep slope, whilst those further apart a more gentle one. In general, the more heavily the hachures are drawn, the more impressive the feature is on the ground (Fig 24).

Fig 19 Laying out the grid. The ranging rod on the left is on the base-line and the fieldworker is now beginning to measure out a 20m side to the right-angle. In the foreground is a box of canes, which will be used to mark each corner of the grid squares.

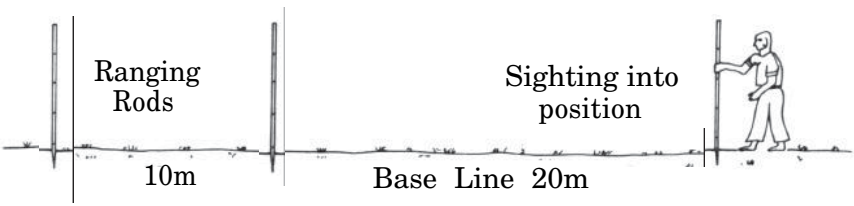
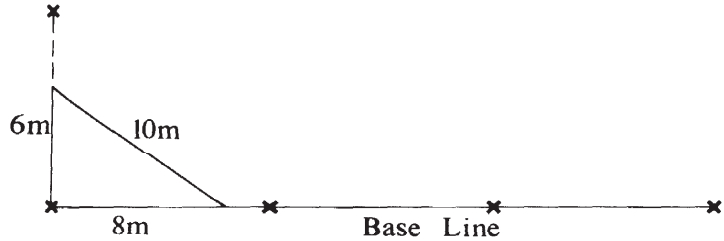


Fig 20 Surveying earthworks: the base-line.



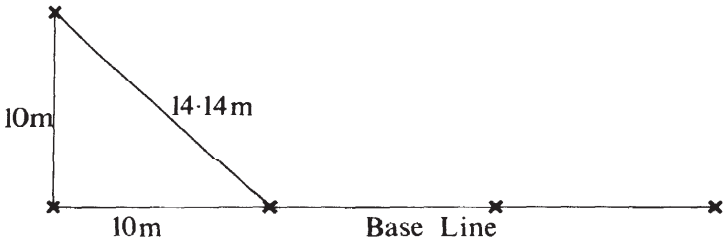


Fig 21 *Surveying earthworks: setting out right-angles.*

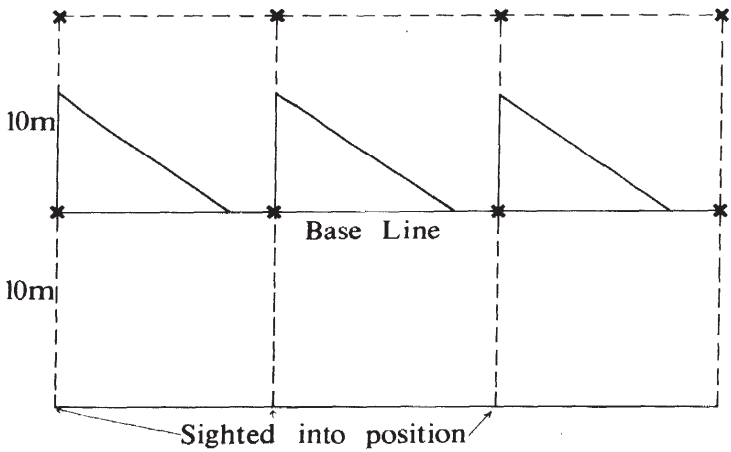


Fig 22 *The 10 metre grid.*

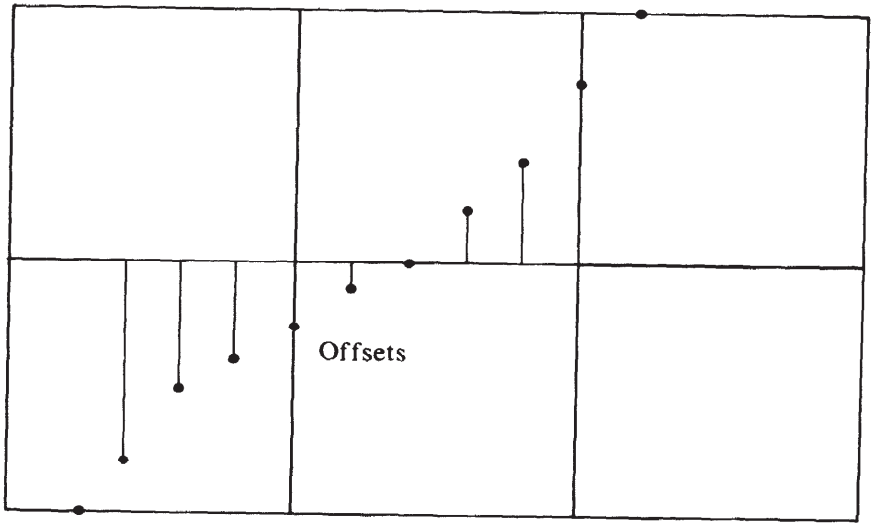


Fig 23 Drawing in offsets.

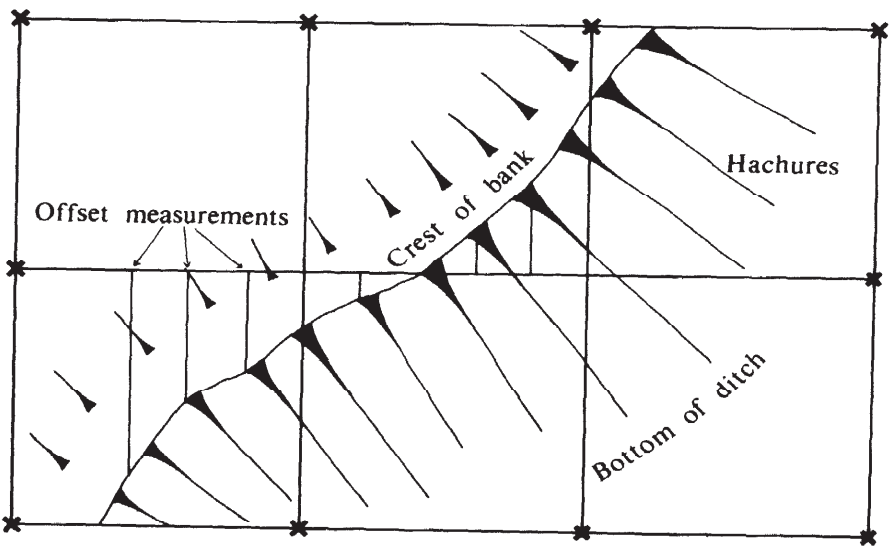


Fig 24 Drawing in hachures.

Surface scatters and their recording

Every child has collected something at some time or another; it may be matchbox labels, or the plastic animals which are slipped by advertizers as bait into cornflakes packets. Often coins and sometimes bottles are the theme. The teenager progresses to beer mats and postage stamps. The unconsidered trifle in the detritus of past cultures becomes the most valued item in the child s collection. This collecting instinct, allied to a spirit of adventure and an insatiable curiosity, has led children to notable geological and archaeological discoveries. The Ribchester helmet (a Romano-British parade helmet, one of the prized objects of Roman metalwork in the British Museum) was picked out of the bank of the river Ribble in Lancashire by a boy in 1796. This year another lad, playing in a Yorkshire stream and indulging in trout tickling, fished out a 10th century Anglo-Saxon sword. The remarkable Palaeolithic painted caves of Altamira in northern Spain were discovered by a boy who followed his dog through a fissure in the ground which led into the caves. These archaeological finds were important enough; they are paralleled in geology by the great discoveries of the famous girl geologist, Mary Anning, who found a splendid skeleton of an ichthyosaurus and the paddle of a Plesiosaurus nearly 7ft long, in the Lower Lias cliffs near Charmouth in 1811. They are now the glory of the British Museum (Natural History).

It should be possible to harness some of this potential energy in schoolchildren into encouraging them to look for the tangible and visible clues of earlier human occupation on the surface of ploughed land. With few exceptions, every type of archaeological site can be detected by the presence of flint and stone objects of various kinds, bones, pottery, metalwork, and building materials. These finds, when studied and compared with other published or museum material, will give some indication of the function of the site and the date-range of its occupation. First the techniques of fieldwalking will be briefly discussed and then the problems of recording and identification of finds will be outlined.

Timing

Fieldwalking is best carried out from autumn to spring, and most landowners willingly allow access to their arable fields when the ground is bare or recently sown. Whilst artefacts are often visible on the surface immediately after ploughing, however, their number will increase as the larger clods of earth begin to weather as a result of drying, frost exposure, or rain action. The further break-up of the soil caused by harrowing will similarly increase the artefact recovery-rate, so that intensive fieldwalking is generally best left until this stage of the farming programme. Walking can also be carried out after drilling or planting, in the few weeks before the crop starts to cover the ground completely. Thus, where winter cereals are grown, investigation should be carried out during October and November, but it will often have to be delayed until December or January in those areas where root crops are cultivated. When spring cereals and potatoes occur as crops, fieldwork can generally be undertaken during the first quarter of the year.

Bright or low-angled sunlight makes it most difficult to recognize surface material. The best results are usually obtained in overcast conditions. Similarly, many smaller objects show up better during light rain, or after heavy rain has washed them clean. It will be realized that the most productive time for fieldwalking will be those when the weather and time of year will be at their most uncomfortable. Warm waterproof clothing and suitable refreshment needs thought and planning (see above).

Cultivation practice

Land which has been ploughed only for the first or second time after it has been permanent pasture for many years will show its archaeological content more clearly than that which has been under cultivation for a long time. The finds will be less scattered and more closely tied to their original context. Their spatial distribution will thus give a better indication of the area of the site than finds which have been moved by successive ploughing. Air photographs give a good indication of this happening; when they are taken of the same patch of Celtic fields under plough over several years they show that the effect of ploughing is gradually to spread the wall banks which originally surrounded each rectangular field further and further from their original position. If the breaks in the pottery fragments that are picked up from the field surfaces seem comparatively fresh and unabraded they have probably been ploughed up from their archaeological deposit quite recently. If heavily bruised and abraded they may have been lying in the plough-soil for many years and, indeed, may be nothing more than the result of successive manurings (see p 40 for an elaboration of this). Prolonged cultivation at a site limits the usefulness of the results there obtained. This is why it is essential to discuss the cultivation history of their fields with local farmers (see section on *Oral evidence,* p 35). For example, ploughing will often penetrate deeper on heavy land than on light soil, and this will result in a greater disturbance of any underlying archaeological content. The increasing practice of direct drilling, with a minimum of preparatory cultivation, may well inhibit the discovery of sites. The consequent impaction by heavy machinery, however, often leads to the use of pan-busting every five years or so which can be more destructive of archaeological levels than prolonged ploughing. Lambrick s booklet on *Archaeology and Agriculture* (1976) demonstrates this well.

Fig 25 The reconnaissance. The children are walking across the field with sticks in their hands, looking for signs of human occupation which they will mark with their sticks. The dip in the fieId surface in the background is the line of the north Oxfordshire Grim s Ditch, a pre-Roman Iron Age territorial boundary. This field produced evidence of three Romano-British sites, dated by the pottery, to the 2nd-3rd centuries AD.

The reconnaissance

For the best results from fieldwalking, arable land should be crossed initially along a number of closely and evenly spaced traverses by way of a reconnaissance, *without collecting,* to determine the position and extent of sites. The children taking part should be spread out into a line about 3 metres apart (Fig 25). The line then moves forward across the field. Almost every field in England will produce a handful of medieval and later pottery, and many will yield Romano-British pottery, resulting from successive dungings. The miscellaneous character of this material will soon become apparent to the beginner and may be discounted with little more than a reference to its nature and occurrence. However, denser and consequently more significant scatters of artefacts and building materials should be recognized and marked with canes. If these scatters occur at the edge of a field, search should be made of the adjacent areas on the other side of the boundary for any continuation.

This location and preliminary survey of a site can best be carried out by a group of people. However, to collect an even and representative sample of the total artefactual material of the site, the detailed recording must be left to an individual worker. A fieldwalking group might therefore combine to locate and define a number of sites and subsequently disperse to carry out the detailed investigation at the individual sites.

Detailed investigation the grid

A simple grid or network of points extended over the area of an observed surface scatter will provide a series of squares in which finds can be located and recorded. It will also permit the results to be accurately plotted on a large-scale map such as the OS 1:2500. A base-line should be established by either tape measurement or compass bearing from known fixed points such as field boundaries, barns, etc, and from it a square or rectangle extended to surround the area to be recorded (see above, *Earthwork recording,* p 57). The opposite sides of this framework are then divided into an equal number of parts, being the same for all four sides. Two more lines, similarly divided, are then set out, joining the centre points of opposite sides of the framework, with the result that all the remaining points of the grid can now be sighted into position without further measurement, as each point will be in line with four others already fixed (Fig 22). The individual squares of the grid may be marked by pegs or bamboo canes. These can be painted white or have small plastic or cloth pennants attached for easier sighting. The size of the squares can be varied according to the particular problems of the site, but generally should not exceed 20m 20m.

Collection of material

When gridding out is complete, a start can be made on collecting material. Bags marked with numbers, each number corresponding to a square on the plan, are given out, one bag per child. Each child is allotted a square and is asked to traverse the square for a fixed number of times to ensure an even coverage, picking up everything in his square which is man-made (Figs 26, 27, 28).

What to pick up

This will be dealt with in more detail in the section on *Identification of finds,* but basically it encompasses all man-made objects, which may include worked flints, shaped stones, pottery and glass fragments, and objects of bone and

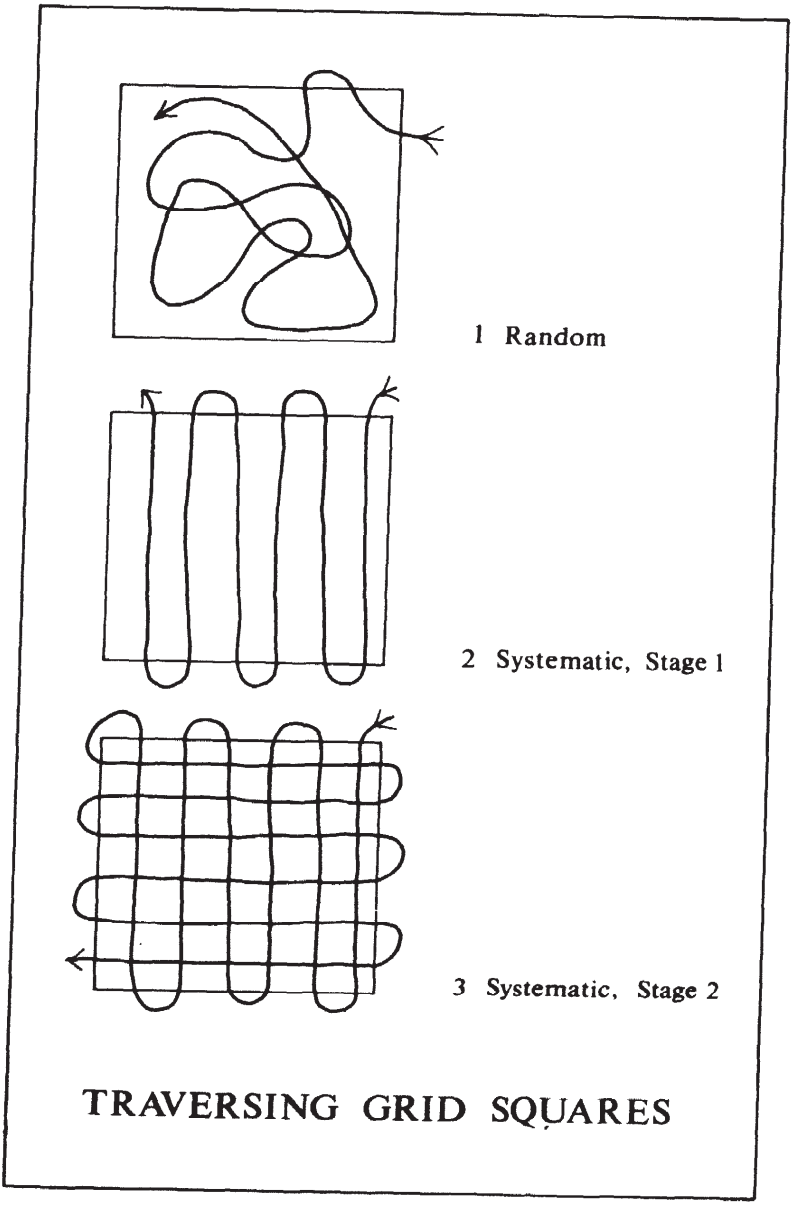


Fig 26 *Traversing grid squares.*

Fig 27 *Detailed investigation. The field has now been gridded out in 20m squares and the children are being issued with marked bags, one bag for each square.*

Fig 28 *Collecting material. One child is allotted to each square and is engaged in picking up and bagging all the finds within that square.*

metal. The inexperienced fieldwalker will undoubtedly put pieces of stone and other natural objects into his bag initially. This can be dealt with by carrying out a rough and ready identification on the field-edge. Obviously extraneous geological material can be discarded if bags get too heavy too soon! It is worth making the point, however, that pottery and stone objects, heavily coated with soil, may well look like clods of earth. When the square has been traversed for a sufficient time, say 10-15 minutes, a halt is called and the bags are closed with wire ties and collected. Further numbered bags (corresponding with the numbers given to fresh squares) are issued and the children are directed to new squares. So the fieldwork proceeds, square by square until the area has been systematically scoured. Children of, say, 8-11 years can well take on the fieldwalking of at least three squares in an afternoon. Secondary schoolchildren are able to cope with more, perhaps up to half a dozen.

The processing of finds

The finds, when duly bagged and tied and the labelling checked, are piled on the field edge and are put in a rucksack or barrow or simply carried back to the car or bus which has brought the party on the expedition. They need to be cleaned, sorted, and classified as soon as possible afterwards. This is best done (in a day-school) during the lunch hours of the week following the actual collection of the material. A sink-unit and an area of benching for laying out finds are desirable facilities for a school archaeological unit.

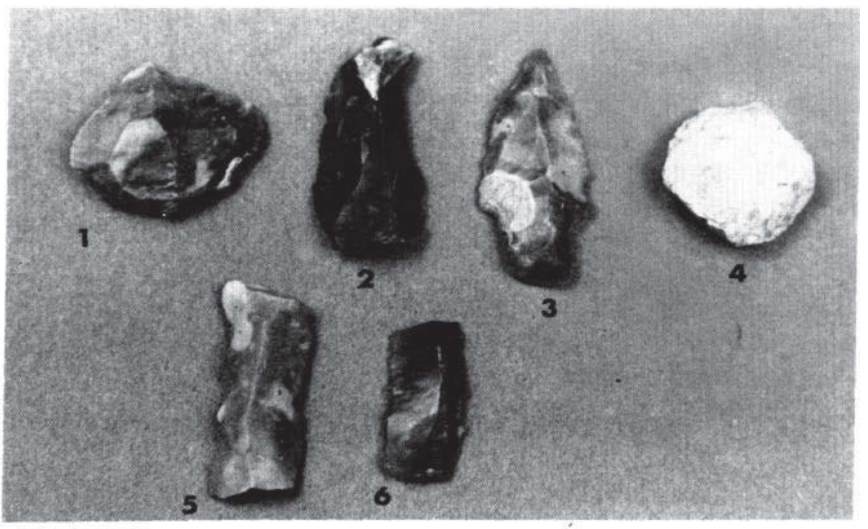


Fig 29 Prehistoric flint implements found in fieldwalking in north Oxfordshire: 1 multi-purpose tool which started life as a scraper and was subsequently used as a gouge by a left-handed person; 2 thick flake, triangular in section, probably hafted an obtuse angle and flat curving top edge suggests a knife; 3 small tanged spearhead; 4 thumbnail scraper; 5 uncertain, but a worked flint, possibly a gouge with a broken end; 6 a thin snapped blade. Scale . (Oxfordshire County Museum).

The finds should be divided into different groups by the material of which they are composed. *This means separating out pottery, stone, bone, and metal. The same cleaning processes are not appropriate for all materials.* Prehistoric and Saxon pottery is so friable and ill-fired that it should not be washed at all. Wetting it will simply encourage it to disintegrate still further. It needs drying and gently brushing to remove loose dirt; it should then be put into contamers which will protect it from knocking against harder objects. Roman, medieval, and post-medieval pottery can all be washed and dried, but not scrubbed, because interesting evidence such as a sooty deposit on the outside of the vessel (indicating contact with a fire) can easily be removed by scrubbing. Bone objects should be dried, not washed, because bone is absorbent. Metal objects should also be cleaned carefully rather than washed, since washing only hastens the process of corrosion. They should be placed in individual boxes and a drying agent such as silica gel introduced which will effectively dry out the micro-atmosphere within the box. Once the material has been cleaned it can be more easily identified and marked with Indian ink.

The identification of finds

Until the teacher is familiar with the material he is handling, assistance with identification must be sought from more experienced people, such as the staff of the local museum, members of the archaeological society, and perhaps the field officers of the archaeological unit in his area. Study sessions might profitably be arranged for this. Much can be learned by going to museums and handling the considerable study collections which are to be found behind the scenes in store. Some museums are also prepared to make up reference collections which they are willing to lend out for periods of time. After a year or two of fieldwork, the ideal solution can be achieved, which is for the school to build up its own reference collection whose identification has been checked by experts.

Stone objects (Figs 29 and 30)

An admirable guide to flint implements is that produced by the British Museum, *Flint Implements: an account of Stone Age techniques and cultures* (3rd edn, 1968). By reading this and studying collections in the local museum the teacher, and through him the children, should quickly begin to distinguish those flints which were humanly shaped from those whose form derives from natural agency. Characteristic combinations of acute-angled scars left on the stone surface by the deliberate detachment of flakes often include flat, small, and steep scars resulting from retouching at the edges as well as a swelling or bulb arising beneath the original point of percussion. Abrasion, to produce the ground surface of an axe, might similarly be identified from the mass of tiny parallel wear scratches marking a very smooth stone. These ground and polished axes of Neolithic times, when subjected to thin sectioning and petrographical analysis, turn out to have been made at axe factories as widely separated as Cornwall or near Great Langdale in the Lake District. Even solitary individual finds thus acquire an importance when seen against the pattern of trade over the whole of Neolithic Britain. The Council of British Archaeology (see *List of useful addresses.* p 92) can put teachers in touch with the local member of its Implement Petrology Committee, who will be able to advise. Often, the single flint implement is found after further searching to be part of a much more numerous assemblage. Several hundred, or perhaps even several thousand, flint flakes picked up within a small compass suggest that perhaps here there was an

Fig 30 Querns for grinding corn: 1 (right) pre-Roman Iron Age or possibly Romano-British quern; 2 (left) medieval millstone fragment; 3 (centre) piece of millstone grit quern, uncertain date. (Oxfordshire County Museum)

implement factory, a flint mine, or a working floor of a Mesolithic, Neolithic, or Bronze Age site. Stone went on being used for implements into the Iron Age and beyond, particularly in areas such as the far north where other materials were in short supply. In the treeless Orkney and Shetland Islands, for instance, stone clubs, slate knives, stone lamps, spindle whorls, perforated stone net sinkers, and weights are found in profusion in prehistoric and Viking sites. There were even quarries of a soft soapy stone called steatite where bowls were carved out of stone in the Viking and early medieval periods. Iron Age hillforts produce round or oval pebbles which were used as slingstones or pot-boilers (the latter are found covered with a web of small cracks). Pieces of quernstone often turn up in field scatter. The earliest type used from the Neolithic until the Iron Age are saddle querns, made of fine-grained sandstone with a concave contour where a hollow has been worn down by rubbing grain to grind it into flour. Fragments of coarse, quartz-filled sandstone, with one side flat and sometimes milled, are from hand rotary querns; look for signs of a central hole (Fig 30). Sometimes they are made from grey, pock-marked lava, a material which was imported from the Rhineland from Roman times until the 14th century. Honestones, sticks of mica schist, a glistening grey stone used for sharpening knives, were also imported across the North Sea from Norway. They are found frequently on deserted medieval village sites. Sandstone rubbers and sharpening stones, often cigar-shaped, are found frequently near hedgerows where they were broken and dropped by hedgers in the 18th and 19th centuries. The evidence for prehistoric ploughs has nearly always disappeared (except for plough-marks found on the subsoil under barrows) but we know that pebble studs were attached to the wooden heels, apparently to lessen friction. Such pebbles will show wear on one side, resulting in pronounced striations.

Pottery (Figs 31-45)

This has been made in Britain for well over 7000 years at a great number of places where suitable clay and fuel and a convenient water supply are found. A wide variety of both coarse and fine fabrics has been produced which at times displayed conservatism in manufacture and design, yet on other occasions quickly dated with rapid changes in fashion. Similarly, some potters had large outputs, providing for a mass market and using industrial techniques, and trading their wares over long distances (the famous Roman samian ware was like this). Others were small, possibly catering only for the community in which their wares are found. Within any region, pottery styles and the material or fabric of the finished vessels therefore varied from one locality to the next. The prolonged exploitation of particular clays and potting techniques could lead to similarities between the fabrics of vessels produced at different times. The information which pottery may be able to supply our school field archaeologists can be summarized under five headings.

1 The *form and function* can be retrieved from studying the sherd and deducing which part of the vessel it has come from. This will be a piece of rim, base, body, handle, or spout. The diameter of the vessel can be inferred from fitting the curvature of the sherd into a piece of card which has marked on it a series of concentric circles of different diameters. By studying pottery reports in excavation reports or by referring to a general guide such as the CBA s *Romano-British coarse pottery, a student s guide* (3rd edn, 1976), different forms can quickly be recognized. Form is shape; shape is dictated by technique, skill, and function. It is worth recalling, when considering the functions which pottery has, that the very many materials from which we make containers today, such as cardboard, plastic, tin, and steel, were not available to more primitive societies who had to be content with leather, wood, and pottery. Hence a huge variety of forms, with a multiplicity of functions, is found in pottery. Such vessels as jars, bowls, cooking pots, burial urns, and cups are found in prehistoric pottery. Romano-British pottery produced a vast extension of the range of forms from inkwells and money boxes at one end of the scale to enormous amphorae for the import of oil and wine at the other. Medieval pottery also produced new forms such as costrels, fish dishes, chafing dishes, and even watering cans. Only gradually did post-medieval ceramic traditions produce such familiar standbys as chamber pots, casseroles, and cups and saucers. Fragments of all these can be picked up on the field surface. When washed they are easily identified..

2 The *fabric* is of interest because a study of it can tell the initiated where the pot was made. This is because clays have mineral traces which are unique to the particular geological source of the material. Scientific analysis of minerals present in the fabric of Iron Age pottery of the West Midlands, for instance, has shown that much of it was made in the Malverns and distributed widely through Herefordshire and Shropshire. Pottery nearly always contains some other material than clay which acts as a filler . These were sand, shell, limestone, or calcite which were added to give the clay a porous relatively open body, capable of surviving the hot temperatures of firing, and of resisting the stresses of rapid heating when being used for cooking. Sometimes material such as hard calcite or ground-up ironstone was introduced into the inner surface of Roman mortaria to produce a resistant hard-wearing surface suitable for pounding vegetables against. At other times the vessel was dipped in a solution of clay of a different colour (slip), and this may have given a cheap, coarse pot a more expensive appearance. Pseudo-samian pottery was manufactured in this way in

the Roman period, with the glossy orange appearance simply being surface finish.

3 *Decoration* can take many different forms. Neolithic pottery was decorated by grooves incised into the surface of the vessel, or by using whipped cord, finger-tipping, stamping, and combing (Fig 31). Bronze Age pottery added applied strips to this repertoire of decorative techniques (Fig 32). Iron Age pottery introduced the idea of colour coating, and all over burnishing (Fig 33). Belgic pottery (the last stage of the Iron Age) specialized in rouletting transferring a pattern cut on a small revolvable disk against the outside of the vessel. Romano-British pottery exhibits great variety and complexity of decoration (Fig 34). New ideas came in such as thick body-colour slip which was piped on the side of the pot in the form of animals and men, and the use of slip with a high iron content to provide a wide range of colours from jet black to bright orange. Another Romano-British decoration was rustication, whereby the clay was pulled up from the surface of the pot when still plastic and allowed to remain in a rough form. Some late Roman pottery is glazed; glazing was reintroduced in the late Anglo-Saxon period and lead glazing became generally widespread after the end of the 12th century. Only a small proportion of medieval pottery is glazed certainly a far smaller proportion than appears in the display cabinets of museums. Decoration also took the form of applique strips, hatched pads, stripes of slip, and animal and human forms, attached particularly to jugs. Rackham s book *Medieval English pottery* (2nd edn, rev J G Hurst) is

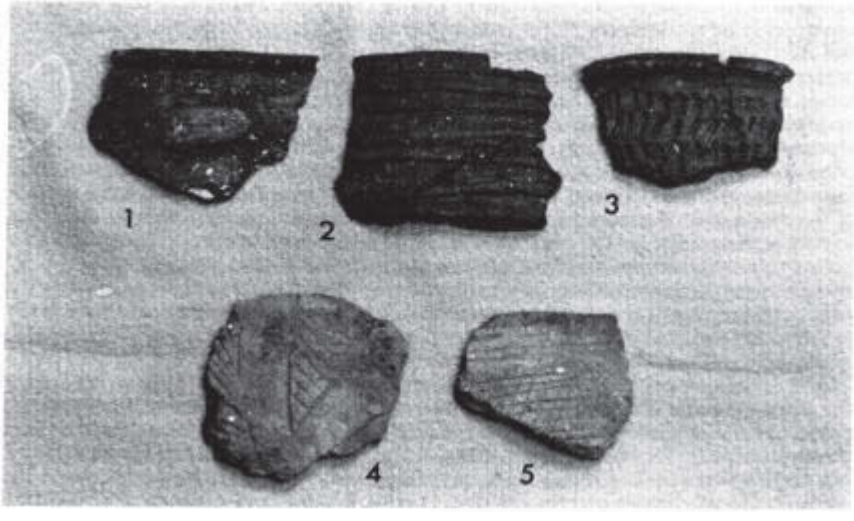


Fig 31 Fragments of Neolithic and Beaker pottery: 1 a piece of early Neolithic round-based bowl of shell-gritted ware, probably fired in a bonfire. Note the lug far suspension. From a causewayed camp at Abingdon c 3000 BC; 2 a piece of late Neolithic shell-gritted grooved ware. The grits allowed the pot to expandand contract without cracking when it was fired in a bonfire. From a gravel pit at Sutton Courtenay c 2000 BC; 3 part of a large round-bottomed bowl in hand-made shell-gritted ware, ornamented with impressions made by a bird bone. Middle Neolithic c 1500 BC; 4 and 5 are parts of a Beaker, a flat-based pot of fine ware, made between 2000 and 1500 BC, a traded prestige item often buried with its owner. The decoration of zigzags and pendant triangles reflects contemporary designs and is often found in zones on the vessel. From a gravel pit at Radley. Scale 1:4. (Pottery by courtesy of Ashmolean Museum.)

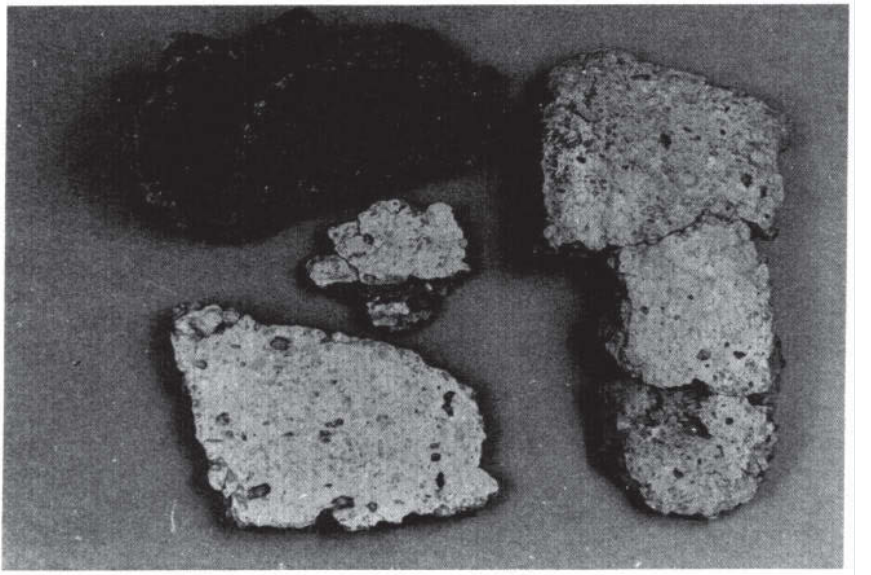


Fig 32 Fragments of a Bronze Age cremation vessel. The top left view is of the inside of the base of the vessel and indicates the soft, friable nature of the fabric of the pot and the large size of the sandy pebble inclusions in the clay. The sherd on the right comes from the centre of the vessel and is decorated with a flattish thickened cordon at the shoulder. The corky nature of the outside of the vessel shows that pieces of organic material were burned out when firing took place, probably in a bonfire. From Stanton Harcourt, c 1000 BC. Scale 1:4. (Oxfordshire County Museum)

helpful in describing the range of English medieval pottery. Post-medieval pottery is characterized by slip decoration, and at the end of the 16th century delft (tin-glazed earthenware) was introduced. Salt-glazed stoneware came in at the end of the 17th century and finer decorative techniques such as sprigging, printing, and transfer work came in during the last two centuries.

4 *Technique:* The condition of the fabric of potsherds will suggest what sort of firing conditions the pot has been through. The very friable nature of some prehistoric pottery indicates that it has been fired in a clamp kiln (very little different from a bonfire on the surface of the ground). By studying the surface of the sherds we can tell much about how the pots were made. They may have been built up using the coil method; there may be signs of knife paring; the use of the potter s wheel is obvious when the thickness of the body becomes more uniform and the rilling (marks left by the potter s fingers on the inside of the pot) can be seen. With more efficient kilns in the Romano-British period and the use of the fast wheel, pottery becomes mass-produced, hard, machine-made, and common. Cultural degeneration followed in the pagan Saxon period. Kilns were mere scrapes in the ground and the pottery coarse and ill-fired, apart from barbaric, bulbous, and overdecorated funerary urns. Medieval pottery rediscovered many Roman techniques but substantial technical development did not take place until more effective kilns delivered high enough temperatures

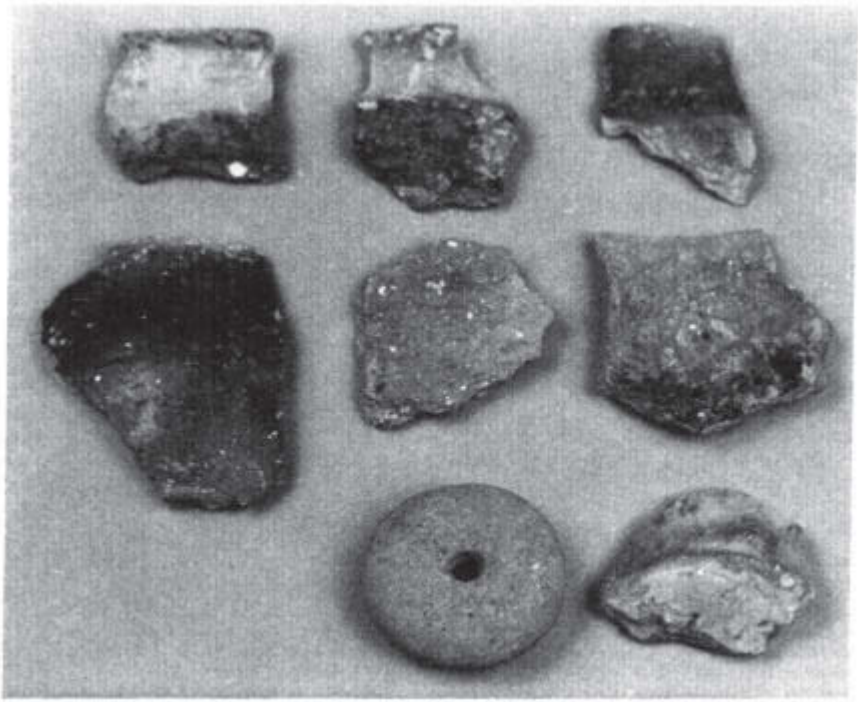


Fig 33 Iron Age pottery found in fieldwalking in Oxfordshire. Note the irregular thickness of the walls of the vessels and the large limestone inclusions introduced by the potter to temper the pots in the firing. The pots are coil-made and the surface of the large black sherd has been burnished to produce a smooth shiny finish. Early 3rd century BC. The ironstone spindle whorl was found nearby. Scale 1:4. (Oxfordshire County Museum)

to produce stonewares at the end of the 16th century.

5 *Imported wares:* In almost every period some pottery has been brought into the country from abroad. These imported wares which produce distinctive sherds are of particular interest in defining trade routes and distribution areas and in suggesting dates for home-made pottery found in association with them. What imported pottery does *not* demonstrate in the prehistoric period is the invasion or migration of people coming into the country bringing their pottery with them. It is now becoming increasingly fashionable to play down the invasion hypothesis in British prehistory: every major change in pottery styles is no longer interpreted in terms of a folk migration or even a hostile invasion. The new explanations lay more stress on the import of pottery by trade and less on the imposition of new populations. Two examples may be quoted. In the last century of the Iron Age in southern England, between Caesar s expeditions (55 and 54 BC) and Claudius s invasion (AD 43), the south-east of the country was overrun by Roman traders promoting their pottery and metal wares, pushing wine and other luxuries on a market patronized by a willing Celtic aristocracy. This imported pottery is found on many Belgic sites in eastern and southern England. Trade in this case preceded the flag. During the 9th to 11th

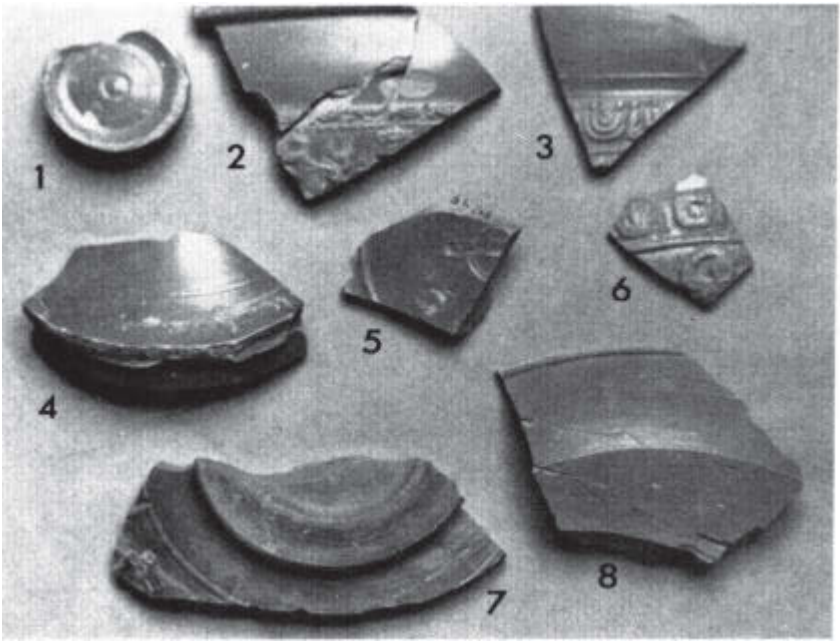


Fig 34 Fragments of Roman luxury table wares. Samian pottery made in central and southern Gaul and the Moselle valley in the first three centuries AD. It is a red/orange ware with bright, glossy surface, easily identifiable in the field. It can be elaborately decorated by means of moulds (2,3,6) or plain (8). It is sometimes called Terra Sigillata *or stamped ware because the potter frequently added his name by stamping it on the base before firing (5). It is of archaeological value chiefly because it can be closely dated within 15 to 20 years. Scale 1:3. (Oxfordshire County Museum)*

centuries pottery was imported on a large scale into England from the Rhineland and Holland. After the Norman Conquest pottery imports tended to shift down-Channel to Normandy. The Angevin Empire, based on a link between England and western France, encouraged the Anglo-Gascon wine trade. Pottery from the Saintonge region of south-western France came in with the wine and the distinctive parrot-beak jugs are found in many urban and castle sites in 13th century England (Fig 38).

The characteristics of pottery in each period are briefly outlined and illustrated here (Figs 3l-37, 39-45) but it is important to remember that each locality and each region is liable to produce a different range of forms, fabrics, and decorations. Until firmly stratified sequences of pottery from sites occupied over a long period are published there will be much guesswork about the dating of particular sherds.

K J Barton s book *Pottery in England, from 3500 BC to AD 1750* (1975), although short, is a valuable guide to further information. Whilst the broad development of pottery in Britain might be understood from a textbook, ability to recognize pottery sherds can only develop with increasing practical experience and first-hand acquaintance with the material displayed and stored in local museums.

Fig 35 Romano-British coarse pottery. Fragments picked up from fieldwalking at North Leigh and Dorchester, Oxfordshire: 1,2,3 two rims and a piece of base of cream fabric mortaria. These were shallow bowls with heavy flanged rims and spouts, strengthened internally by the addition of multi-coloured translucent quartzite gritting (3). They were used for pounding vegetables and grain and were made in the 2nd/3rd centuries AD in potteries to the west of Oxford; 4 two bases of red colour-coated enclosed vessels from kilns near Oxford. The colour-coating was a form of slip which the vessels were dipped into before firing. The resultant colour was at times aimed to produce the effect of a more expensive luxury table ware like samian; 5 six rims and bases of grey wares. The forms suggest necked bowls and they vary from black to light grey; such sandy wares were made widely and locally; 6 rim of very large coarse storage vessel in a grey fabric with an incised lattice decoration; 7 rim of a cream fabric vessel with red paint applied underneath so-called parchment ware from Oxford kilns; 8 rim of a black dog bowl , shallow and straight-sided; 9, 10 three pieces of creamy fabric colour-coated enclosed vessels, 9 dark brown slop, 10 a base dipped in red slip. Kiln source is Nene Valley; date 2nd to 3rd centuries AD. (Oxfordshire County Museum)

Fig 37 (opposite) Late Saxon wares, AD 1050-1100 from Church St, Oxford. The dark sherds are from straight-sided, hand-turned cooking pots. The rim is thickened, T-shaped. The body sherds are decorated with rectangular rouletting and combing. The four sherds of light shiny pottery are Stamford-type ware. They are likely to be from pitchers, wheel-turned, in a fine white fabric; the lead glazing varies from light green to orange and the mottling is caused by iron present in the clay. Scale 1:3. (Oxfordshire Archaeological Unit)

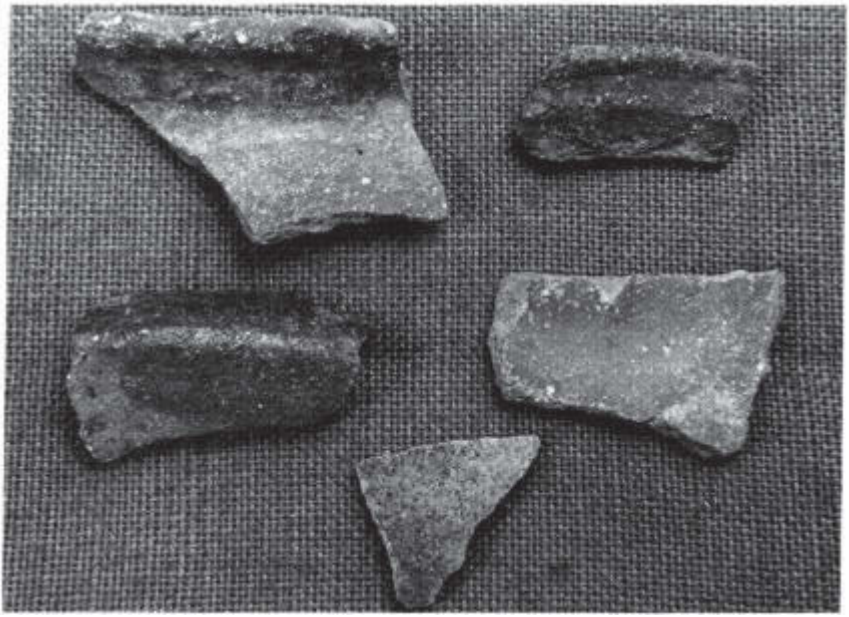
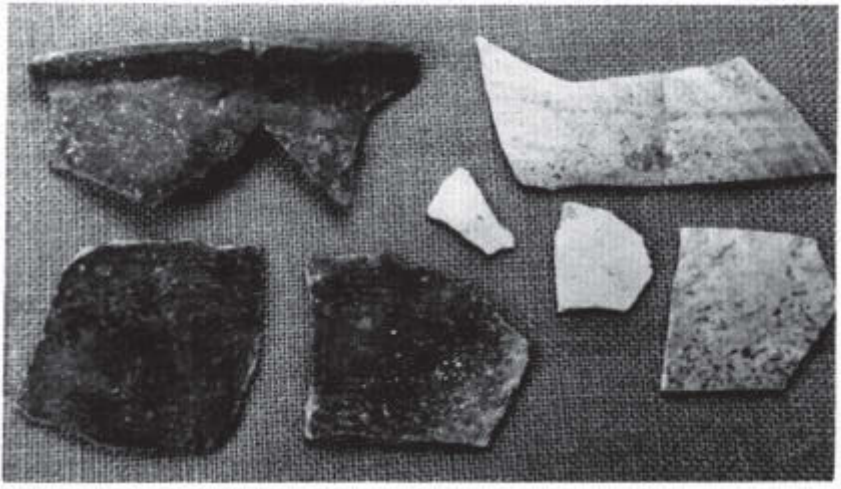


Fig 36 Late Saxon wares, AD 1050-1100 from Church St, Oxford. The fabric of these sherds is clay with limestone inclusions which probably comes from the local calcareous gravels. The bulbous cooking pot is hand-turned with a simple rim. Scale 1:3. (Oxfordshire Archaeological Unit)



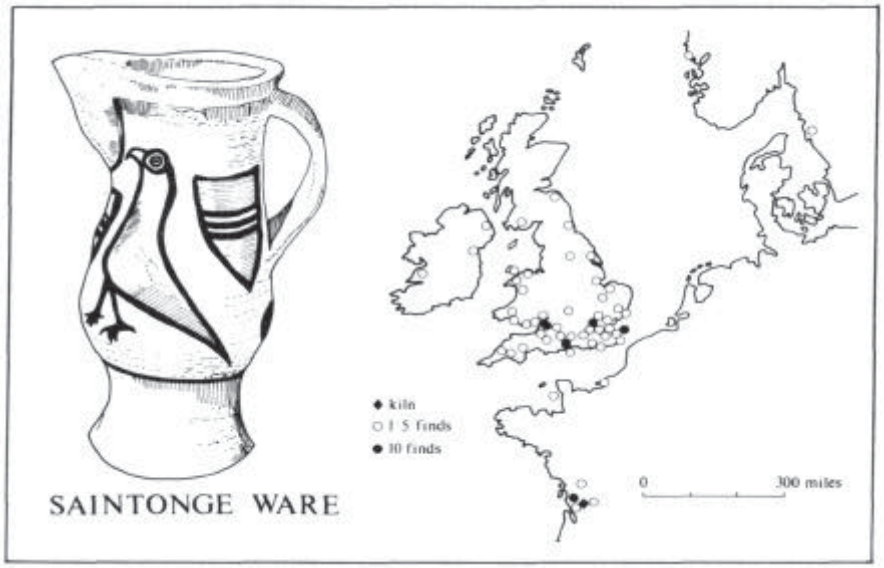


Fig 38 The jug on the left is a late 13th century product of the Saintonge kilns of the Loire Valley in south-western France. It is of white fabric with a distinctive parrot beak lip and polychrome painted decoration of birds, heraldry, and sometimes foliage. Such jugs were brought into England with cargoes of Gascon wine. Their wide distribution in urban and castle sites gives a good indication of the popularity of Gascon wine in late 13th century England. Potsherds of such vessels can provide supporting archaeological evidence of medieval trade. Map and drawing based on G C Dunning's work in Rotterdam Papers, *1968, with permission.*

Fig 39 Different types of jug handles from Oxford late-medieval jugs, 14th-15th century in date. It is necessary to pierce or slash these thick clay handles to promote even firing in the kiln. The main types are strap and rod handles. Scale 1:4. (Oxfordshire Archaeological Unit)

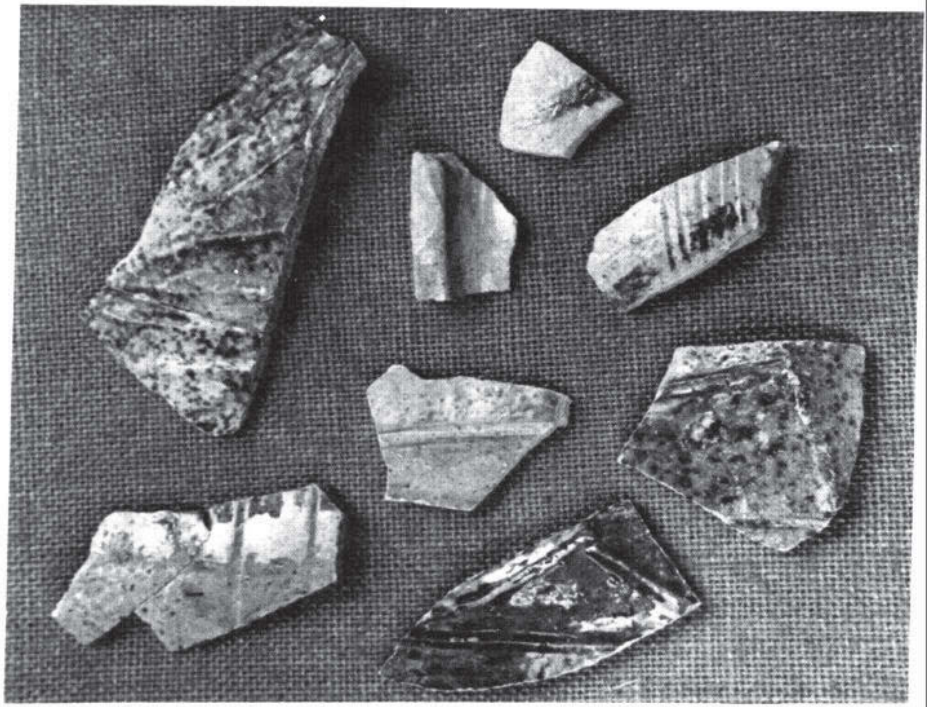


Fig 40 These sherds are from a homogeneous group of Oxford late medieval decorated jugs (14th-15th century). The decoration is applied strips of clay in the same fabric as the body, or in red-brown clay strips. The two groups of colours, yellow/orange/brown and green, are caused by firing the jugs in different conditions in the kiln. Firing with oxygen present produces a yellow/orange glaze; when oxygen is removed, the reducing atmosphere produces a green glaze. Mottling is caused by adding copper filings to the lead glaze. Scale 1:3. (Oxfordshire Archaeological Unit)

Fig 41 Two fragments of 14th century vessels from Church St, Oxford. The upper one is coil-made and is a large cooking pot or storage vessel. The lower one is a porringer, wheel-thrown with external rilling. Note the black carbonization, proof that the vessel has stood over a fire. Both were probably made in the Chiltern region. Scale 1:3. (Oxfordshire Archaeological Unit)

Fig 42 These two large jug fragments came from the artisans quarter of the Hamel, Oxford and were made in the mid 16th century AD in the Bucks/ eastern Oxfordshire region. Note (1) the internal rilling, the marks left by the potter s fingers as the spot spun round on the wheel; (2) the pitting on the left hand piece, the result of frost action, indicating that the vessel was kept outside the house; (3) the lead glaze which is crudely applied over only part of the jug. Scale 1:3. (Oxfordshire archaeological Unit)

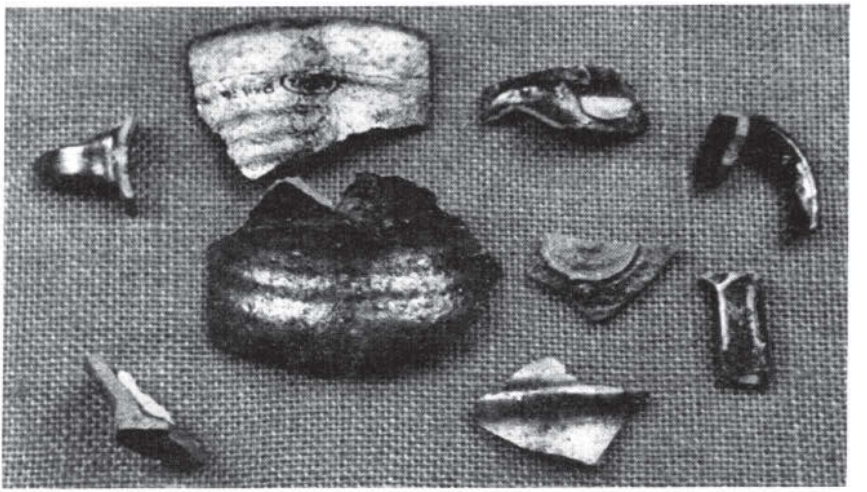


Fig 43 A number of fragments of Cistercian ware, mid 16th century in date, from the Hamel, Oxford. These were from small multi-handled tygs or beakers. Scale 1:3. (Oxfordshire Archaeological Unit)

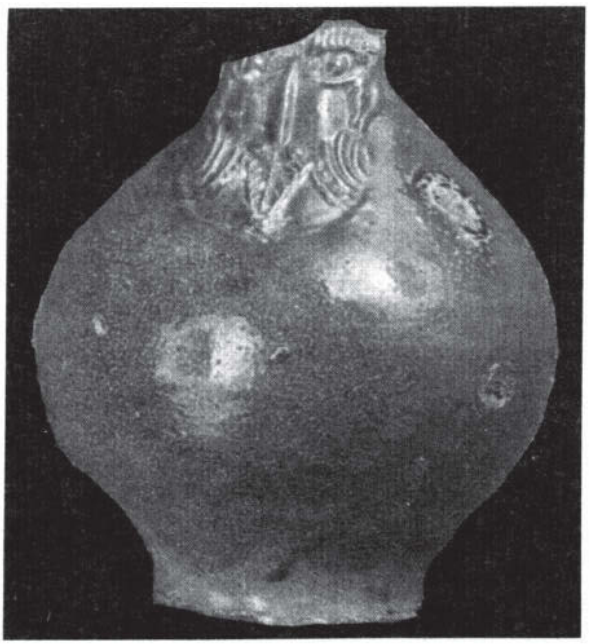


Fig 44 A Bellarmine. Such Rhenish flagons with a human grotesque mask on the neck were called Bellarmine after an unpoplar Catholic cardinal in the Spanish Netherlands. They were widely imitated in England in the late 16th to 17th centuries. This one has a brown mottled glaze; the neck is broken and the rim and handle absent. Scale 1:3. (Oxfordshire Archaeological Unit)

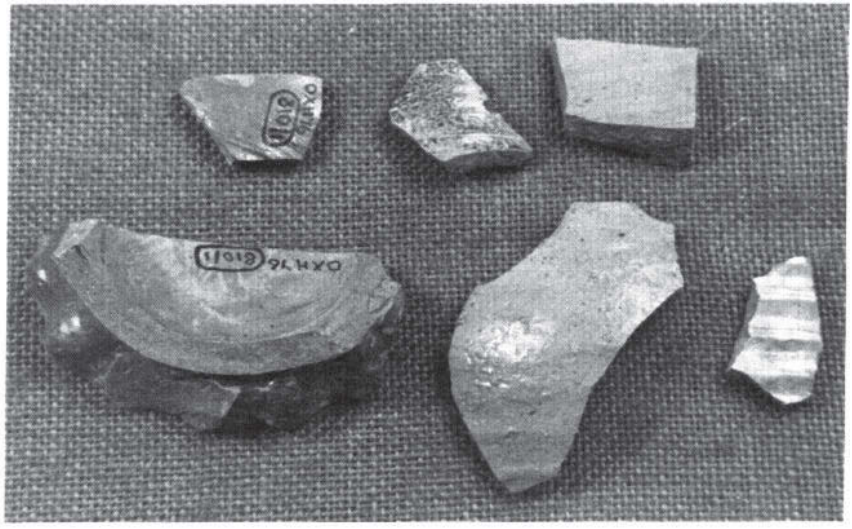


Fig 45 Pieces of stoneware from Church St, Oxford. Such pottery was initially imported from the Rhineland and then imitated in the late 16th century. It led to the English salt-glazed stonewares of the 17th and 18th centuries, grey or brown mottled or speckled. These fragments are from tankards or small jugs. The fabric is extremely hard and breaks correspondingly sharp. Scale 1:3. (Oxfordshire Archaeological Unit)

Building materials (Fig 46)

The signs of prehistoric buildings are elusive in the stoneless regions of the south and south-east, but daub (fire-hardened clay with wattle) impressions are sometimes to be found on ploughed-up prehistoric occupation sites. This material was used to infill panels between timber uprights of huts. In the north and west, hut circles of large stones are common from the Bronze and Iron Ages. The former sites of barrows which have been ploughed out can be recognized by building materials. The Lambourn long barrow in Berkshire, for instance, shows up as a series of pieces of sarsen (hard siliceous sandstone) jutting up from a low chalky mound. The sarsen represents the remains of a collapsed burial chamber. A number of long barrows in the Cotswolds have been virtually destroyed by ploughing, but are seen in ploughed fields as long, much eroded mounds of limestone fragments. Quantities of bricks, tiles, and plaster picked up in a small area point to the likelihood of former building. Unfortunately confusion may arise from the practice that farmers have of filling up ponds and putting down hardcore round rutted and muddy field openings. Check the patch of building material found in the middle of a field with early maps. Often hedgerows have been pulled out and nothing is left except the site of the gate opening.

Bricks are of many sizes. Wood in *Collins field guide to archeology in Britain* (277-8) gives the dimensions of bricks from Roman times onwards, and John Williams has written interestingly on Roman building materials in *Britannia,* **2** (1971), 166-95. Tiles were used extensively by the Romans and the rectangular flat tiles *(tegulae)* with two opposite edges turned up were linked by curved cover

Fig 46 Romano-British building materials. Fragments picked up from fieldwalking in Oxfordshire: 1 two pieces of curved roof tile (imbrices). *These were semi-circular in shape and fitted over the junction of two flat-flanged roof tiles (2) called* tegulae; *3 two pieces of box-shaped flue tiles the curved incised patterns are for keying in with plaster; 4 pink wallplaster made of ground-up pottery, tile, lime, and sand; 5 structural iron work. Nails (square-sectioned and wedge-shaped) and two pieces of hinges; 6 floor tile with mark of dog s foot made before the tile was fired; 7* tesserae, *cubes of limestone, grey and white, the raw material of mosaic pavements; 8 two pieces of stone slate, one with perforation for roof nail. (Oxfordshire County Museum)*

tiles *(imbrices)* (Fig 46). Hot air was piped through walls and under floors by box-tiles, which are bottomless ceramic boxes with patterns of incised lines to serve as keying for plaster. The presence of Roman flooring can be detected by small cubes of brick, tile, or stone; the more elaborate mosaic floors show up as masses of small cube-shaped coloured stones. The evidence for roofing may simply be a large number of stone slate fragments with peg holes perforated in them. Medieval peasant house-roofs occasionally had tiles round the inflammable chimney areas. Glazed and crested ridge tiles are often picked up on medieval sites. Glazed floor tiles and sometimes inlaid floor tiles are found on the sites of more important buildings such as manor houses or monastic granges. Ashlar (squared) masonry has usually been robbed out from a demolished building, but stone rubble of an unexpected geological provenance will betray the previous existence of a building.

Glacial erratics lying on the surface of fields were often collected together to form the foundation walls of buildings. Fire-reddened or cracked stones may

betray the former presence of a hearth or kiln. Stones with circular depressions drilled in them were used as door pivots. Structural ironwork such as hinges, locks, and keys only became frequent when iron was made in large quantities from the 16th century onwards.

Metal objects

Prehistoric bronze tools and weapons are found fairly frequently by digging operations. Groups of tools and weapons, sometimes broken, were the stock-in-hand and scrap of itinerant bronze smiths who buried hoards and never returned. The British Museum s *Guide to the later prehistoric antiquities of the British Isles* gives a useful indication of the main types of bronze object likely to be found. The *Catalogue of Bronze Age Objects* published by the Castle Museum, Norwich, is also very helpful. Far more frequently picked up in field scatter, and more problematical, are objects made of iron. The iron artefact is usually heavily corroded with rust and is hardly ever found intact, and so its original form is difficult to recognize. Another difficulty is that the forms of many tools such as saws, knives, and chisels, once determined, usually in Roman times, changed very little during the ensuing fourteen hundred years. For these reasons iron objects are rarely closely datable. They fall into several broad divisions. Horse furniture (as it is called) includes stirrups and spurs which fell off while their riders were spurring over fields and were lost, These went through many fashions and are quite closely datable. Horseshoes, too, had changing forms of design: wavy-edged horseshoes, for instance, are 12th century or earlier; they were succeeded by straight-edged ones and those in which the nails fitted into a continuous groove round the outside (Fig 47). Bits, buckles, terrets, and bridles are more difficult to date closely.

Pieces of structural ironwork are often found in or near the ruins of buildings. They include hasps, staples, hinges, window pivots, and many kinds of iron pins and nails, which range in size from thick, hand-forged (square-sectioned), broad-headed nails used for studding heavy doors, to small cocked-hat shaped horseshoe nails. The point at which nails are bent over may show the thickness of the timber or planks into which they have been nailed.

Tools and weapons are a third category. Some are datable: knives, for instance, with a pointed tang (or spike at the end of the blade for driving it into the handle) are an early medieval (pre-1300) type. The strip-tang type (with a handle consisting of two plates of bone or wood riveted through) is a later medieval type. The location of iron objects often gives a clue to land-use. Barbed hunting-arrowheads, cross-bow bolts, and even deer spears are found in forested areas, where doubtless they missed their targets and were lost, Hodges s book *Artifacts* (1968) is very good on the chemical and technological aspects. An interesting commentary which fits Romano-British objects into their social and economic contexts is Joan Liversidge s book *Britain in the Roman Empire* (1968). Two first-rate reference books are *The London Museum medieval catalogue* (obtainable from the new Museum of London) and I N Hume s *Guide to artifacts of colonial America* (1969). Britain, of course, had a virtual monopoly of manufacturing goods to the colonies in the 17th-18th centuries and so post-medieval artefacts of the USA are virtually identical with those in Britain itself.

Glass

Fragments of containers of various kinds, periods, and types of glass are less often picked up on the surface of ploughed fields than pottery. Glass tends to

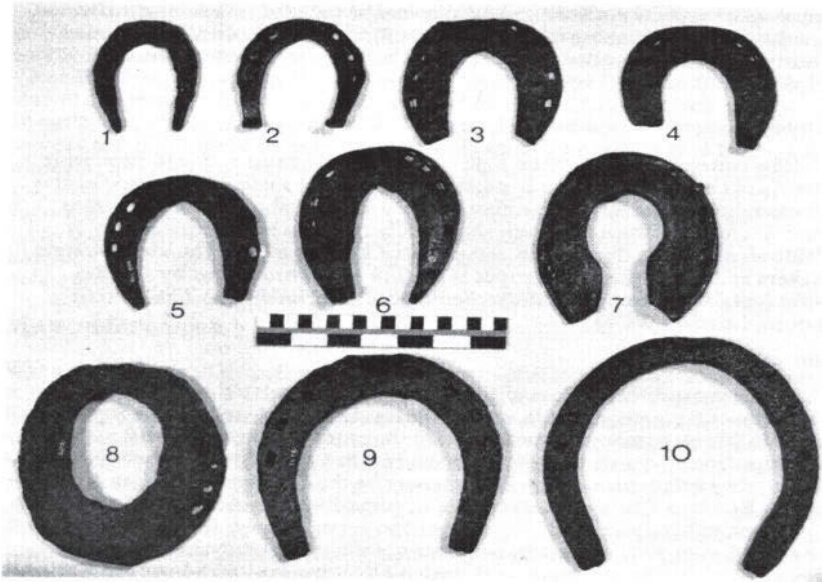


Fig 47 Horseshoes: 1 possibly donkey or pony shoe, probably 18th or 19th century; 2 wavy-edged shoe, 12th century. The wavy edge is not found after the 13th century; 3 and 4 14th/15th century. There is no fullered groom, which tends to be a 15th century introduction; 5 13th or early 14th century, the type of the Dove or Guildhall shoe with the pointed arch; 6 same but with a more pronounced arch. Note the asymmetry of the shoe; each shoe was tailor-made to fit an individual horse s hoof; 7 key-hole shoe, the regular type from the mid 17th century until well into the 18th century. Notice the fullered groove; 8 probably a surgical shoe, possibly 17th century in date. Note the marked dished shape; 9 and 10 19th century draught horse shows probably late 19th century rather than earlier. (Oxfordshire County Museum)

weather more rapidly than pottery and the surface acquires a scaly iridescence which renders it opaque and not so readily recognizable. Glass was not used in Britain before the Roman period, but it was then imported in great quantity and variety; it is found in green, brown, yellow, and blue hues. Saxon glass is much rarer, but sometimes beakers of clearer whiter glass are found with burials. Medieval glass was made in quantity in Surrey from the 13th century onwards and is greenish in colour. The most likely glass finds will be pieces of post-medieval wine bottle and 19th century medicine and lemonade bottle. Wine bottles can be ranged in a fairly closely datable typological series, beginning with small hand-blown bottles with globular bases. A good series up to the middle of the 17th century was published by S Moorhouse in Finds from Basing House (*c* 1540-1645) in *Post-Medieval Archaeology,* **4** (1970); **5** (1971). Noel Hume deals with the evolution of the bottle in the 18th century in *A guide to artifacts of Colonial America* (1969). Talbot has an article on The evolution of glass bottles for carbonated drinks in *Post-Medieval Archaeology,* **8** (1974). Rubbish tips on the edges of towns are now regularly scanned by bottle collectors. We once knew a boy at Kettering who had collected 500 by the age of 14 years, almost all acquired by digging into rubbish heaps, a dangerous and insanitary hobby but one which introduces children to such fascinating

archaeological aspects as the changing shapes and functions (typology) of bottles, the methods used in making them (technology), and the weathering processes (chemistry). For later bottles, A A C Hedges s *Bottles and bottle collecting* (1975) is helpful.

Clay pipes

One of the commonest finds when fieldwalking are the stems and, less frequently, the bowls of clay pipes. Dating is possible by type and shape; as tobacco became cheaper and pipes got larger, the bore of the stem tended to become narrower. Sometimes makers initials on pipes (generally two) can be identified with individuals named in the records. An essential booklet to help the identification of makers and the dating of the pipes is *English clay tobacco pipes* by Adrian Oswald (obtainable from British Archeological Association, c/o The British Museum, London WC1).

Bones and shells

Perhaps the most difficult class of finds to deal with when fieldwalking are the remains of humans, animals, and molluscs. D R Brothwell s book *Digging up bones* (1963) is an excellent introduction to the study of human skeletal remains. The temptation to dig up the rest of the body when an odd human bone is found on the surface must be resisted. It may be the first sign of a pagan Anglo-Saxon or Romano-British cemetery, and expert advice should be sought from the professional archaeologist, With regard to animal bones, archaeologists have tended to neglect the faunal evidence coming from excavations; they have relegated it to the end of reports and contented themselves with long and boring lists of identifications (by a specialist), failing to integrate the findings into their reports. It is now more widely realized that, by collecting large numbers of bones from stratified contexts in archaeological sites, something meaningful can be said about the food of former inhabitants, for example the proportions of beef, mutton, pork, and venison in their diet. Moreover, animal bones contain much vital information about stock breeding and size and age of animals at death (the latter can be computed from a study of the teeth and the extent to which the ends of the long bones have fused). Butchering techniques and the use of animal bone for tools (waste cut-outs, for instance) are other areas of interest. Clearly, stray bones ploughed up from buried archaeological deposits are not going to answer specific questions of this kind. It is, however, helpful to be able to identify cow, horse, sheep, and pig teeth, and to be able to tell from which part of the skeleton the various bones have derived; the comparative size will then afford a valuable clue as to which sort of domesticated or wild animal they have come from. A readable introduction is Don and Patricia Brothwell s *Food in antiquity* (1969), which covers plant remains as well. More detailed books which aid identification are I W Cornwall s *Bones for the archaeologist* (1964) and R E Chaplin s *The study of animal bones from archaeological sites* (1971).

Recently, much interest has been aroused by the study of land snails, which are seen as indicators of the environment of early man in Britain. The effects of prehistoric farming communities on the landscape and the ways in which they have gradually cleared forest and drained marshes are reflected in the snail populations, which are highly selective of their favoured habitats. Hence it is possible to say whether the landscape was open grassland or a shady forest, and whether a ditch was stagnant or the water was free flowing when the silts containing the snail shells were deposited, from a study of the molluscs.

J G Evans brings snails into the evidence in his brilliant work *The environment of early man in the British Isles* (1975). A more detailed but equally fascinating book is his *Land snails in archaeology* (1972).

Another type of shell the fieldwalker will soon become familiar with is the ubiquitous oyster, extensively used as a food by the Romans, but an equally favourite and cheap dish in the age of Dickens. Furthermore, it has often been ploughed in by farmers because of its lime content. This means that when these white, flaking, irridescent shells are seen on the surface, together with a thick scatter of Romano-British pottery, they may indicate the occupation debris of an ancient settlement. When they are found in a thin scatter over a field which yields fragments of white and-blue china and brown glazed earthenware, however, they may be nothing more than the detritus of some Victorian public-house.

Map references

When recording and mapping a site it is often useful to give directions leading to the site as well as a description of its state of preservation or deterioration. Far more important than these, however, are map references, because many modern landscape features are so short-lived. They can be computed from the National Grid which all modern Ordnance Survey maps show, and the most accurate (and therefore the most useful to other researchers in the field) will be those calculated from the 1:10,500 (6in to 1 mile) or larger-scale maps. Diagrams illustrating the method are printed in the margins of these maps. Initially the south-west corner of the kilometre square within which the site falls should be identified, and from that point a reading should be taken of the large figures corresponding to the grid number of the vertical (eastings) line in the north and south margins and the grid number of the horizontal (northings) line in the east and west margins. As the sides of each square are divided into 100 metre units, the distance east and north of the point of intersection can be accurately calculated to give a six-figure reference. It may be converted into an eight-figure one, accurate to within 10m, by estimating the distance in tenths along the relevant 100m units. The reference should always be prefixed by the two letters representing the 100km square in which the site falls.

The recording and interpretation of fieldwork

The recording of finds

This involves two stages: the record sheet and mapping. Once the material is washed and marked it can be re-sorted again into the three broad categories of stone, pottery, and metal, which may be subdivided as appropriate. The results can be tabulated in a scheme such as the Field Record Sheet reproduced in Fig 49 (p 93), to provide an immediate overall picture of the material. Some of the more interesting finds could be illustrated and more fully described on supplementary sheets, which should be adequately referenced to the main entry. Normally, however, one record sheet should be completed for each square or unit systematically searched in the field, and details of such features as scatters of building materials should be noticed. In practice the system should be sufficiently flexible to permit new columns to be introduced as necessary.

The mapping of sites and finds

The plans and other detailed drawings made in the field should be copied into a neat form whilst their details are still fresh in the mind. If originally executed on graph paper, they should be traced on to more durable transparent plastic sheets. Good-quality Indian ink should be used in a pen such as a Rapidograph which gives lines of constant thickness and has an ink reservoir. Copy-drawing should proceed from the top left to the bottom right in order to avoid smudging work already done. If additions or alterations are made, care must be taken to protect the parts of the drawing already completed by placing a sheet of paper between the hand and the drawing surface. Where mistakes are made, they may be masked by application of process white, such as Snopake. Neat lettering is important in the general appearance of the drawing and can be achieved by using stencils, or more easily, though more expensively, by self-adhesive letters such as those of the Letraset sheets. A drawn metric scale must always be included and all plans should bear a true North point, preferably pointing upwards. Drawings usually look much better when they have a plain border, and any vacant spaces left within the area so enclosed should be used for the title, which should bear the name of the site, the initials of the recorder, and the year of the survey. This last is very important because land development can completely alter the appearance of a site in a very short time, and the date of the survey can be the only clue to assist someone else in appreciating the plan.

It may be felt that such care in drawing up plans of school fieldwork is a counsel for perfection; in fact sixth-form pupils of the school best known to both of us, with an aptitude for technical drawing and mathematics, have learned to prepare such plans for publication, simply as an extension of their A-Level studies, seasoned with a warm interest in archaeological fieldwork.

The interpretation of sites and finds

The whole exercise described might well be dismissed as mere mindless data accumulation unless some attempt is made to evaluate and interpret it.

The material found on the surface of a field can indicate the date range of previous human activity at a site, although it must be remembered that the later levels of occupation may be over-represented; the plough may not have penetrated to the earlier levels. The distributions recorded from the individual squares of the grid, by revealing significant variations in the occurrence of different artefact groups, will perhaps suggest something of the original character of a site and the activities carried on, whether domestic, agricultural, or industrial.

Let us take a simple example. Children of a North Oxfordshire primary school gridded and fieldwalked the interior of a badly ploughed pre-Roman Iron Age hillfort near their school. They summarized the results of their work in four maps (fig 48). The first showed the ramparts of the hillfort reconstructed from maps and aerial photographs taken 20-30 years ago. They showed the distribution of worked flints on the second map and demonstrated that the hilltop had been occupied during the Neolithic and Bronze Ages. Their sherd-count and sherd-weight maps both showed a preponderance of late Roman activity in the south-east corner of the hillfort. Evidently it had been reoccupied but not refortified in the 3rd-4th centuries AD. The presence of quantities of burned daub retaining the marks of wattle suggested ovens in this area. In this way such maps can identify the various constituent elements such as domestic and industrial areas of a site, particularly when compared with other types of

information such as air photographs.

Even so, there remain the dangers of an either over-complicated or too simplistic interpretation of the fieldwalking results. A scatter of material which suggests a living area may equally result from an extensive rubbish deposit infilling a quarry pit or field ditch, far removed from an occupation area. Concentrations of what may appear to be building material in the middle of a bare field may represent the hardcore thrown down by a farmer at a former gate entrance in the middle of a now-vanished hedgerow. Slag on the surface of a field may well have been derived from modern blast-furnaces to act as fertilizer; other slags may represent the ploughed-out debris of a pre-Roman or Romano-British iron-smelting site.

All evaluations of fieldwork evidence must therefore be considered subjective to some degree. Only excavation will in fact unfold the true sequence of events on a site and illuminate the various details which fieldwalking can often only hint at.

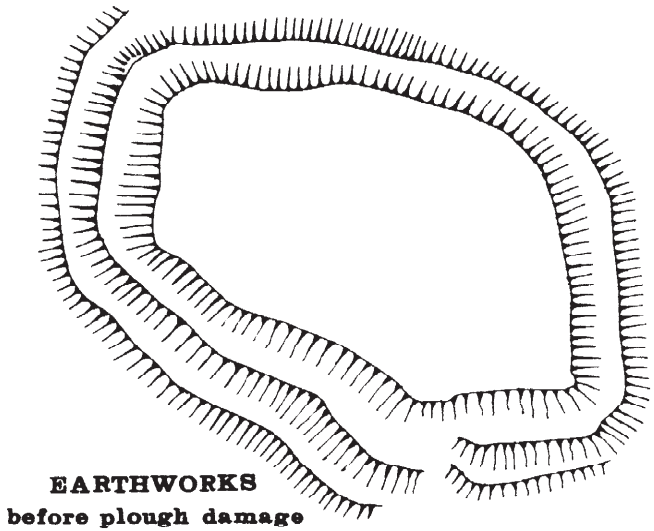
A final word refers to nil returns. Those areas which are searched yet found to be devoid of archeological features should also be recorded, if only as an indication of places where apparently man has not settled. Study of the soils may suggest that such situations were hostile to early settlement, perhaps owing to the former presence of forest or marsh. Alternatively, if an archeological blank occurs in an area where there are the earthworks of early field systems, such negative evidence can shed light on previous manuring practices. A nil return where a field is empty of the remains of early man is thus an archaeological requirement.

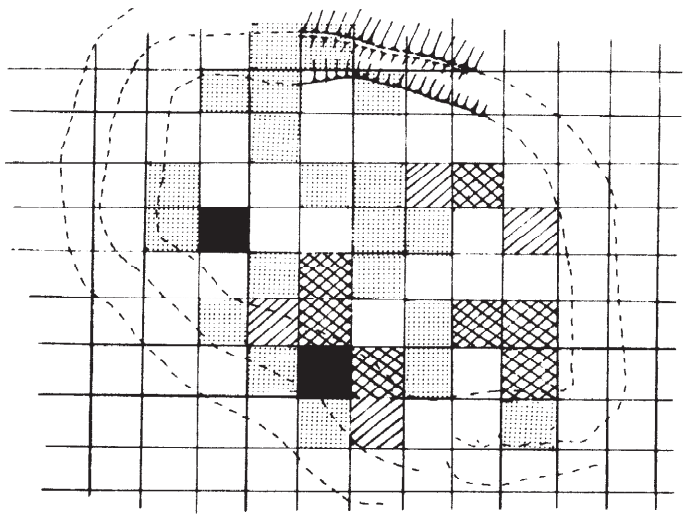
What to do with the results of archaeological fieldwork

Obviously the results obtained from such a programme of archaeological fieldwork as has been described ought to be made available in some form to other students and workers. At the end of the project, the total recorded evidence, comprising documents and maps, plans and photographs, detailed records of observations made in the field, and cultural objects, bagged and listed by site, ought to be deposited in a museum, library, or other archive. It then has a chance of being added to the archaeological knowledge of the region, and ultimately may contribute towards the totality of the national archaeological record.

Most local museums maintain records of discoveries made in their area and will generally be glad to accept full reports of fieldwork as well as the finds made during surveys. Increasingly all over the country local authorities are themselves setting up Sites and Monuments Records, based in either museums (preferably) or planning offices, covering known antiquities in their areas. Where such a consolidated record is well advanced, as with the Oxfordshire Sites and Monuments Record, a firm foundation for the future interpretation of prehistoric and historic landscapes has been laid. This information is made available to local planning authorities so that its content can be considered in future planning decisions affecting the survey area.

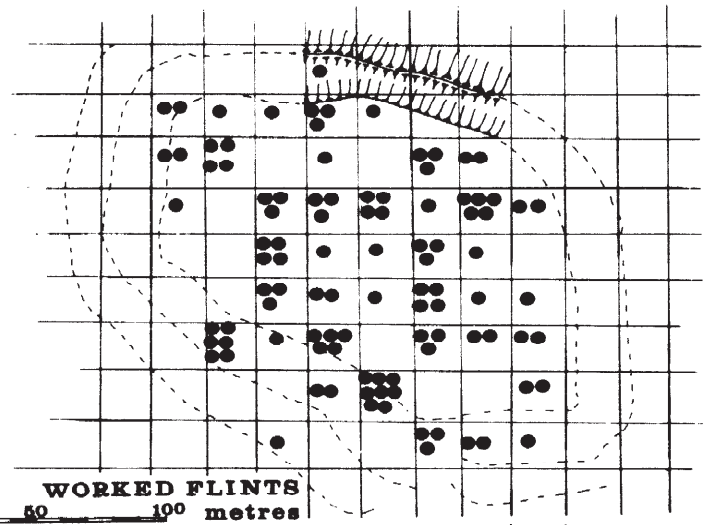
Clearly, the maintenance and extension of such records requires a continuing amount of archaeological input, and this is where the work done in schools throughout the country can perform such a valuable service. Such effort becomes pointless unless attempts are made to synthesize and interpret the known data in a wider context. Some pitfalls have already been pointed out in the process of assessing evidence. The interpretation of all distributions of archaeological findspots should be approached with caution. They may merely

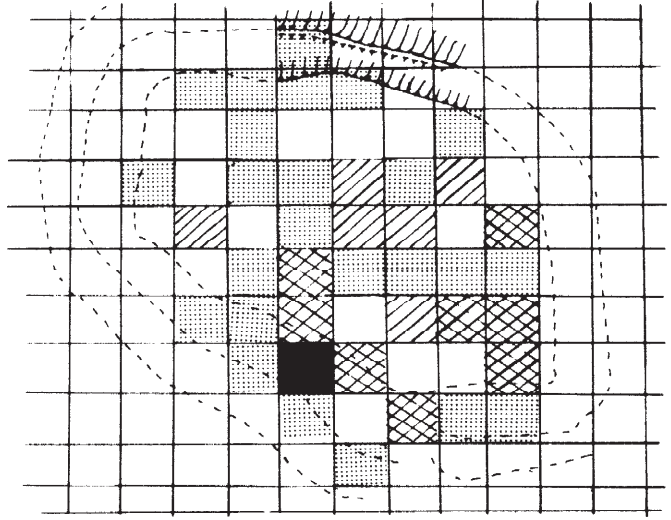




0-100
100-200
200-300
300-500
over 500grms

ROMANO-BRITISH
SHERD WEIGHT





0-5
6-15
16-25
26-50
over 50

ROMANO-BRITISH
SHERD COUNT

MADMARSTON CAMP OXON.

PRN 1592

Fig 48 Madmarston hill-fort

reflect the activities of modern archaeologists rather than the true distribution of the traces of early man. For example, a series of finds of Bronze Age weapons and tools from the river Mersey suggested that its course had been used as a trade route in earlier times, until it was realized that the distribution of artefacts merely reflected the accident of discovery during the large-scale engineering works involved in the construction of the Manchester Ship Canal! Similarly, the 15 mile cycling distance from Oxford factor must surely account for many of the dense findspots of material recorded within a small radius of that historically and archaeologically minded university city.

Nevertheless, mere data collection will remain a mechanical and meaningless process unless It is accompanied by some attempt, albeit tentative, at interpretation. Even the driest of field records can yield much information about the people whose traces it records and thereby breathe life across the centuries. Ezekiel knew something of this when he was set down in the midst of the valley which was full of bones. And caused me to pass by them round about and behold there were very many in the open valley, and lo, they were very dry . . . (and the Lord God said) . . . Behold, I will cause breath to enter into you, and ye shall live . . . Past landscapes need peopling.

Useful books

The following books and articles are further sources of information about archaeological fieldwork. An asterisk against an entry in the book list indicates a title recommended for the school library. The volume numbers of periodicals are printed in bold type.

Addyman, P V, & Morris, R (eds), 1976 *The archaeological study of churches,* CBA Research Report **13**
*Allison, K J, 1970 *Deserted villages*
Applebaum, S, 1972 Roman Britain, in *Agrarian history of England & Wales, Vol I pt 2, AD 43-1042* (ed H P R Finberg), 3-277
Aston, M, & Bond, C J, 1973 Sketch planning: an introduction, *CBA Group 9 Newsletter,* **3,** 8-12
*Aston, M, & Rowley, T, 1974 *Landscape archaeology*
Atkinson, R J C, 1953 *Field archaeology,* 2 edn
Baker, A R H, & Butlin, R A (eds), 1973 *Studies of field systems in the British Isles*
Barley, M W, 1961 *The English farmhouse and cottage*
, 1974 *A guide to British topographical collections*
*Barton, K J, 1975 *Pottery in England. From 3500 BC-AD 1750*
Benson, D, 1972 A sites and monuments record for the Oxford region, *Oxoniensia,* **37,** 226-37
*Beresford, M W, 1954 *The lost villages of England*
* ———, 1957 *History on the ground*
* ———, & Hurst, J G, 1972 *Deserted medieval villages*
Bowen, H C, 1961 *Ancient fields,* reprinted 1970
British Museum, 1968 *Flint implements, an account of stone age techniques and cultures,* 3 edn
*Brunskill, R W, 1971 *Illustrated handbook of vernacular architecture*
Childe, V G, 1931 *Skara Brae, a Pictish village in Orkney*
*Coles, J M, 1972 *Field archaeology in Britain*
*Collingwood, R G, & Richmond, I, 1969 *The archaeology of Roman Britain*
Colvin, H M, Ransome, D R, & Summerson, John, 1975 *History of the King s Works: Volume 3, 1485-1660 (part 1),* being the latest in a series of such volumes which began in 1963
Crawford, O G S, 1929 *Air photography for archaeologists*
*———, 1953 *Archaeology in the field*
———, & Keiller, A, 1928 *Wessex from the air*
Cunliffe, B W, 1971 Some aspects of hill-forts and their cultural environments, in *The Iron Age and its hill-forts* (eds M Jesson & D Hill), 53-69
———, 1974 *Iron Age communities in Britain*
Darby, H C, & Versey, G R, 1975 *Domesday gazetteer*
Davey, N, 1976 *Building stones of England and Wales*
*Dimbleby, G, 1967 *Plants and archaeology*
*Douch, R, 1967 *Local history and the teacher*
*Ekwall, E, 1960 *Dictionary of English place-names,* 4 edn
*Evans, J G, 1975 *The environment of early man in the British Isles*
Field, J, 1972 *English field names a dictionary*

*Fowler, E (ed), 1972 *Field survey in British archaeology*
Fowler, P J (ed), 1972 *Archaeology and the landscape: essays for L V Grinsell*
———, 1975 *Recent work in rural archaeology*
*Frere, S S, 1974 *Britannia: a history of Roman Britain,* 2 edn
——— (chairman), 1975 *Principles of publication* in *rescue archaeology: report by a working party of the Ancient Monuments Board for England, Committee for Rescue Archaeology*
*Fryer, D H, 1960 *Surveying for archaeologists,* several times reprinted with minor alterations
Gelling, M, 1976 *The place-names of Berkshire,* English Place-Name Society, 3 vols, 1974-6
*Grinsell, L V, 1953 *The ancient burial-mounds of England,* reprinted 1975
———, Rahtz, P, & Price Williams, D, 1974 *The preparation of archaeological reports,* 2 edn
Hall, D N, 1972 Modern surveys of medieval field systems, *Bedfordshire Archaeol J,* **7,** 53-66
Harley, J B, 1972 *Maps for the local historian: a guide to the British sources*
———, 1975 *Ordnance Survey maps: a descriptive manual*
Hewlett, G, 1973 Reconstructing a historical landscape from field and documentary evidence, *Agr Hist Rev,* **21,** 94-110
Higham, N J, & Jones, G D B, 1975 Frontier, forts and farmers: Cumbrian aerial survey 1974-5, *Archaeol J,* **132,** 16-53
*Hooper, M D, et al, 1971 *Hedges and local history*
*Hoskins, W G, 1955 *The making of the English landscape,* several times reprinted
*———, 1967 *Fieldwork in local history*
Jones, J, 1976 *How to record graveyards*
Lambrick, G, 1976 *Archaeology and agriculture: a survey of modern cultivation methods and the problems of assessing plough damage to archaeological sites*
Limbrey, S, 1975 *Soil science and archaeology*
Myres, J N L, 1969 *Anglo-Saxon pottery and the settlement of England*
*Ordnance Survey, 1973 *Field archaeology in Great Britain,* 5 edn
*Orwin, C S, & C S, 1967 *The open fields*
Palmer, S, 1976 *The mesolithic cultures of southern Britain*
Piggott, S, 1954 *The Neolithic cultures of the British Isles*
*Pollard, E, Hooper, M D, & Moore, N W, 1974 *Hedges*
*Rackham, O, 1976 *Trees and woodland in the British landscape*
Raikes, R, 1967 *Water, weather and prehistory*
Renfrew, C (ed), 1974 *British prehistory: a new outline*
Riley, D N, 1944 The techniques of air archaeology, *Archaeol J,* **101,** 1-10
*Rivet, A L F, 1958 *Town and country in Roman Britain*
Roe, D (ed), 1976 *Field guide to the Oxford region,* Quaternary Research Association, Reading
*Rogers, A, & Rowley, T (eds), 1974 *Landscapes and documents*
Rosenfeld, A, 1965 *The inorganic raw materials of antiquity*
Rowley, T (ed), 1974 *Anglo-Saxon settlement and landscape*
Royal Commission on Historical Monuments (England) [RCHM], 1975 *An inventory of the historical monuments in the county of Northampton: vol 1, Archaeological sites in NE Northamptonshire*
Russell, R C, 1974 *The logic of open field systems: fifteen maps of groups of common fields on the eve of enclosure*
Semenov, S A, 1964 *Prehistoric technology, an experimental study of the oldest tools and artefacts from traces of manufacture and wear,* translated from the Russian, with a preface by M W Thompson
*St Joseph, J K (ed), 1966 *The uses of air photography*
Steane, J M, 1977 The development of Tudor and Stuart garden design in Northamptonshire, *Northamptonshire Past and Present,* **5** (5), 383-405
Taylor, C C, 1972 Maps, documents and fieldwork, in Fowler, P J, 1972, 50-9
*———, 1974 *Fieldwork in medieval archaeology*
*———, 1975 *Fields in the English landscape*
Thomas, C (ed), 1966 *Rural settlement in Roman Britain,* CBA Research Report **7**
*Wilson, D R (ed), 1975 *Aerial reconnaissancefor archaeology,* CBA Research Report **12**
*Wood, E S, 1972 *Collins field guide to archaeology,* 3 edn
Wymer, J J, 1968 *Lower palaeolithic archaeology in Britain*

Useful addresses

Ordnance Survey, Archaeology Division, Maybush, Southampton

Council for British Archaeology, 112 Kennington Road, London SE11 6RE

Royal Commission on Historial Monuments (England), Fortress House, 23 Savile Row, London W1X 1AB

Royal Commission on Ancient and Historical Monuments (Scotland), 54 Melville Street, Edinburgh EH3 7HF

Royal Commission on Historical Monuments (Wales), Edleston House, Queens Road, Aberystwyth, Dyfed

Institute of Geological Sciences, Exhibition Road, London SW7

Public Record Office, Ruskin Avenue, Kew, Richmond, Surrey

Field Record Sheet

PARISH:..... FIELD NO ..... SITE NO..... NGR:.....

FIELDWORKER:..... UNIT OF COLLECTION:..... DATE:.....19.....

LOGBOOKRECORD:..... No OF BAGS:..... DISPOSED TO:.....

WORKED FLINTS	PREHISTORIC POTTERY	ROMANO-BRITISH POTTERY			ANGLO-SAXON POTTERY	
		Early	Middle	Late		

MEDIEVALPOTTERY			POST-MEDIEVAL to c 1750	RECENT	SMALL FINDS
Early	Middle	Late			

BUILDING MATERIALS			

NOTES

1 Complete one record sheet for every square or unit systematically searched in the field
2 Ensure that the record sheet is adequately cross-referencced to both the finds with which it deals and the original record of their discovery in the field logbook
3 Sherds should he recorded by the 5-bar gate system , ie𝍸, and their numbers totalled
4 Include descriptions of small finds and building materials

Fig 49 Field record sheet.

Hedge Survey Sheet

Species	Relative abundance in sections			
	1	2	3	4
Ash				
Beech				
Blackthorn				
Buckthorn				
Crab Apple				
Dog Rose				
Dogwood				
Elder				
Elm				
Hawthorn				
Hazel				
Holly				
Guelder Rose				
Maple				
Oak				
Privet				
Plum				
Spindle				
Sycamore				
Wayfaring Tree				
Willow				
Total Species				
Presence of: Bluebell				
Dog s Mercury				
Crested Cow-Wheat				

Hedge No.:.....

Probable age:.....

Probable date of origin:.....

Parish:.....

County:.....

Map Ref:..... to.....

OS Sheet No.:.....

Length of hedge:.....

Locality:.....

Adjacent path No:.....

Adjacent land use:.....

Important features (specify reasons)

(A) Historical:

(B) Aesthetic:

(C) Ecological:

(D) Utility:

(E) None

Photographed:.....

Recorder:.....

Date of survey:.....

Additional Comments:

Fig 50 Hedge survey sheet.

Some other CBA publications

Research Report 6
Romano-British coarse pottery a student s guide
edited by Graham Webster £1.25

Research Report 12
Aerial reconnaissance for archaeology
edited by D R Wilson £8.00

Research Report 13
The archaeological study of churches
edited by P V Addyman & R K Morris £4.50

Research Report 17
Medieval moated sites
edited by F A Aberg £6.00

Research Report 19
Historic churches-a wasting asset
by Warwick Rodwell with Kirsty Rodwell £5.00

Research Report 20
Gazetteer of Mesolithic sites in England and Wales
edited by J J Wymer £12.00

Research Report 25
Castles, town defences, and artillery fortifications in Britain: a bibliography 1945-74
by J R Kenyon £3.50

How to record graveyards
by Jeremy Jones £0.75

British archaeology: an introductory booklist £0.90

Looking at cows (2nd Beatrice de Cardi lecture, 1977)
by Christopher Taylor £0.40

Archaeology in schools (information folder) £1.00

COUNCIL FOR BRITISH ARCHAEOLOGY
112 Kennington Road, London SE11 6RE

ISBN 0 900312 81 5