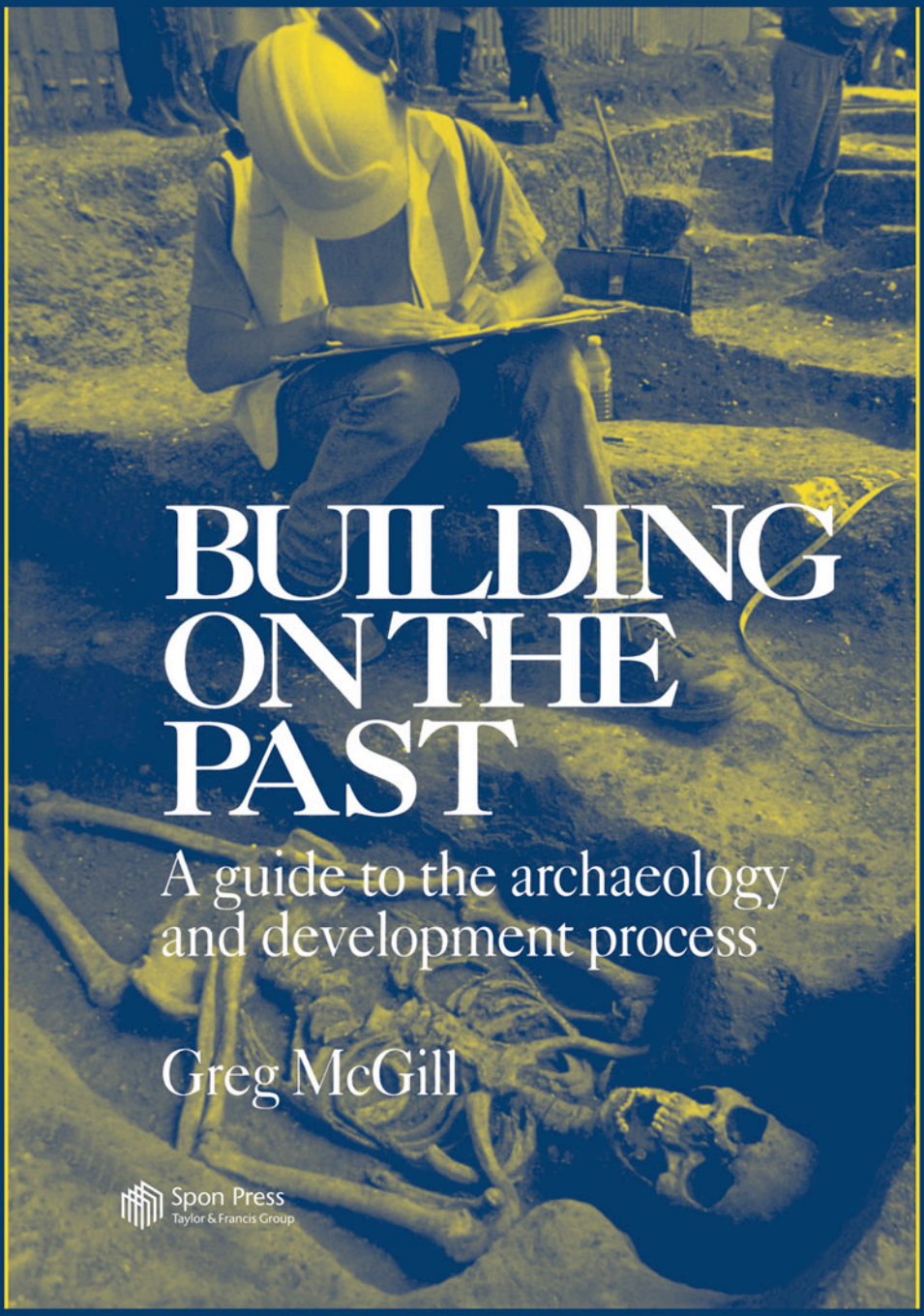

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A guide to the archaeology and development process

Greg McGill
The College of Estate Management
Reading, UK

E & FN SPON
An Imprint of Chapman & Hall
London · Glasgow · Weinheim · New York · Tokyo ·
Melbourne · Madras

Published by E & FN Spon, an imprint of Chapman & Hall, 2–6 Boundary Row, London SE1 8HN, UK

Chapman & Hall, 2–6 Boundary Row, London SE1 8HN, UK

Blackie Academic & Professional, Wester Cleddens Road, Bishopbriggs, Glasgow G64 2NZ, UK

Chapman & Hall GmbH, Pappelallee 3, 69469 Weinheim, Germany

Chapman & Hall USA, One Penn Plaza, 41st Floor, New York NY 10119, USA

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First edition 1995
This edition published in the Taylor & Francis e-Library, 2005.

ISBN 0-203-36219-5 Master e-book ISBN

ISBN 0-203-37477-0 (Adobe e-Reader Format)
ISBN 0 419 17690 X (Print Edition)

A catalogue record for this book is available from the British Library

Library of Congress Catalog Card Number: 94–79769

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ENGLISH HERITAGE

From the Chairman

We greatly value our archaeological heritage for the link it provides to our history, not only through individual monuments and buildings but also because of the way past occupation has influenced the modern countryside and townscape through field patterns, street plans, major monuments such as cathedrals and collections of buildings. We recognize the importance of these various aspects under both general planning legislation and specific measures such as the scheduling of ancient monuments, the listing of historic buildings and the designation of conservation areas.

Until November 1990, scheduling was the one statutory mechanism which guaranteed that the case for the preservation of archaeological remains was fully considered—a tool available only to the Secretary of State. In 1990 the Secretary of State published PPG-16 on *Archaeology and Planning* which gives advice to developers, planning authorities, archaeologists and other interested parties on archaeology in the development process. The PPG confirmed the materiality of archaeology in the planning system but also placed it firmly on the centre stage of the development process.

As the statutory advisers to Government on archaeological matters, English Heritage also provides advice to planning authorities and developers. We view our role as reconciling the legitimate tensions which can occur between the need for economic development on the one hand and the preservation of our archaeological heritage on the other.

This book will assist in the process of increased understanding of each other's problems and as such I commend it to a wide audience and wish it every success.

JOCELYN STEVENS CVO
Chairman of English Heritage

Acknowledgements

I have received help and advice from many individuals and organizations and I am grateful to them all. More especially I would like to thank David Chapman, John Dillon, Tim Dixon, Peter Fasham, Richard Hall, June Hargreaves, Katie Jones, Andrew Lawson, John Oxley, Robert Pilcher, Bill Trench, Karl Wiggins and the College of Estate Management. I would also like to reserve a special thank you to Alison Andrews and to my wife Sheila, without whom this book would not have been possible.

List of acronyms

AAI	Area of Archaeological Importance
AC	Law Reports, Appeal Cases, House of Lords
ACA	Association of Consulting Architects
ACAO	Association of County Archaeological Officers
BEC	Building Employers' Confederation
BLR	Building Law Reports
BPF	British Property Federation
BRE	Building Research Establishment
CAO	County Archaeological Officer
CASEC	Committee of Associations of Specialist Engineering Contractors
CBA	Council for British Archaeology
CBI	Confederation of British Industry
CD	Contractor's Design
CIOB	Chartered Institute of Building
DA	Development Area
DCF	Discounted Cash Flow
DLG	Derelict Land Grant
DNH	Department of National Heritage
DoE	Department of the Environment
DoT	Department of Transport
DTI	Department of Trade and Industry
EA	Environmental Assessment
EAGGF	European Agricultural Guidance Fund
EC	European Community
EGCS	Estates Gazette Case Summaries
ERDF	European Regional Development Fund
ERM	Exchange Rate Mechanism
ESA	Environmentally Sensitive Area
ESF	European Social Fund
EU	European Union
EZ	Enterprise Zone

FASS	Federation of Associations of Specialists and Subcontractors
FF	Fixed Fee (Form of Prime Cost Contract)
GC	Government Contracts
GDO	General Development Order
GIS	Geographical Information Systems
GLC	Greater London Council
IA	Intermediate Area
ICE	Institution of Civil Engineers
IDO	Interim Development Order
IFA	Institute of Field Archaeologists
IFC	Intermediate Form of Building Contract
JCT	Joint Contracts Tribunal
LBC	London Borough Council
LIBOR	London Interbank Offered Rate
LPA	Local Planning Authority
MAFF	Ministry of Agriculture, Fisheries and Food
MAP	Management of Archaeological Projects
MC	Management Contract
MW	Minor Works
NPPG	National Planning Policy Guideline
NRA	National Rivers Authority
PAN	Planning Advice Note
PPG	Planning Policy Guidance
RCAHMS	Royal Commission on the Ancient and Historical Monuments of Scotland
RCAHMW	Royal Commission on Ancient and Historical Monuments in Wales
RCHME	Royal Commission on the Historical Monuments of England
RIBA	Royal Institute of British Architects
RICS	Royal Institution of Chartered Surveyors
RTPI	Royal Town Planning Institute
SCAUM	Standing Conference of Archaeological Unit Managers
SDD	Scottish Development Department
SMR	Sites and Monuments Record
SOEnD	Scottish Office Environment Department
SPZ	Simplified Planning Zone

SSSI	Site of Special Scientific Interest
UCO	Use Classes Order
UDP	Unitary Development Plan
USM	Unlisted Securities Market
VAT	Value Added Tax
YAA	York Archaeological Assessment
WO	Welsh Office

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Introduction

It has been said that more of our heritage has been destroyed in the past 30 years by new development than was previously known to exist. Whether or not this is true there can be little doubt that the destruction that occurred during this period encouraged the conservation movement. Concerned initially with protecting historic buildings it has spread to all aspects of our environment including archaeology. We can confidently say that the desire for the protection of our heritage is now deep-rooted in society.

At the same time there has rarely been a time like the present when new development has been so necessary. Many buildings in our towns and cities, constructed in the late nineteenth and early twentieth centuries are now coming to the end of their useful lives, with many in need of repair or renewal. There is also an urgent need to replace disused industrial and other buildings and to revitalize many inner-city areas and ageing infrastructures.

Against this background it is perhaps not surprising that a conflict of interest should develop between those who wish to protect the archaeological resource and those who wish to develop land. On the one hand there will be those who genuinely believe that protecting what is there should take priority over change and new development. They argue, sometimes to the extreme, that development projects should be prevented if destruction of archaeological remains is the likely outcome. Conversely, there are those who see progress in development as paramount. They see archaeological investigation as abstract and unnecessary, arguing that little additional information can be obtained from out of the ground. In between are the many who wish to see buildings, roads and other structures provided where they are needed, as efficiently and as effectively as possible, whilst taking into account the need to protect the environment.

These different viewpoints clearly reflect different attitudes to the environment shaped, no doubt, by a variety of interests. Economic, social, moral, cultural, educational and other factors will all have had a part to play with variations in attitude occurring according to personal background, different perceptions, local circumstances and the passage of time. They show that development and archaeology cannot and should not be seen in isolation from each other and other matters.

Significantly, and this is the key, they suggest that attitudes to archaeology and development can change. If opinions can alter through time then it is possible for us to become more aware of the role of the archaeologist and the importance of archaeology in the same way that we can become more aware of the need for development and the concerns of the developer. Of course, we cannot predict all of the issues nor assess all of the implications and we cannot say for certain how one set of actions by a developer will affect archaeology or *vice versa*. Every site will have its own problems requiring its own solutions. But what we can do is seek to improve the situation. If we accept that new development is necessary, and I think we should, we need to look at how archaeological

considerations can be satisfactorily accommodated in the development process.

This is the underlying theme of this book. The aim is to try and reduce the uncertainty and misunderstanding that can exist between archaeologists, developers and those who have to advise or control development. Directed at increasing the knowledge of each group of the roles and concerns of the other parties, my hope is that it will increase understanding and provoke thought for the mutual benefit of the archaeological and development processes.

In pursuit of this aim the book is divided into three Parts. The first looks at archaeological considerations: the intention is to direct the developer's attention to archaeological investigation. Chapter 1 gives an outline of archaeological thinking, paying particular attention to the build-up of knowledge and how it has changed over the years according to circumstances. Essentially it draws attention to the need for early evaluation which Chapter 2 looks at in more detail. Types of site, how they are formed and how to evaluate what lies beneath the ground without actually excavating sites form the main areas of study. Chapter 3 moves on to examine excavation at those sites where this is deemed necessary. Drawing attention to the need for pre-and post-excavation work it seeks to identify the many problems that can arise. Finally, in Part One, Chapter 4 looks at archaeological contracts with the aim of bringing to the notice of developers the codes of practice and the contractual matters that may need to be taken into account when seeking professional archaeological advice.

Part Two looks at public controls. Chapter 5 sets out the roles of central government and the local planning authority before moving on to outline the relevant Acts of Parliament. Here we find that the ancient monuments legislation and the planning Acts are the most important, with the subsequent Chapters in this part of the book dealing almost exclusively with them. Public policy is very much the key, which is what Chapter 6 looks at. This is followed in Chapters 7 to 10 by a study of how monuments are protected and how planning applications, where necessary, are determined. Within this Part I have also thought it necessary to look at the ways in which environmental assessment might be used and how planning gain operates. These are matters that are increasing in importance and accordingly are looked at respectively in Chapters 9 and 10.

In Part Three the line of enquiry is very different. Whilst accepting that public controls are necessary, it is what actually gets built on the ground that is important. Here I am very much aware of the need to set archaeology and planning in a wider context, and especially within the context of the development process. Other matters can be equally, if not more, important to the developer and present the construction and property industries with all sorts of problems. They are matters which archaeologists, planners and decision-makers ought to be aware of.

With this in mind Chapter 11 provides an overview of the development process and the inevitable booms and busts of the development cycle. This sets the scene for what follows, where Chapter 12 looks at some of the problems and pitfalls of project management. Chapter 13 looks at possible design solutions for protecting as much as possible of the archaeological resource.

Construction contracts follow in Chapter 14, where the aim is to draw attention to the main concerns of the developer, the types of contracts that are available and how archaeological matters may be addressed in the clauses. Finally, in Chapters 15 and 16,

we look at financial considerations: first, factors influencing costs and second, sources of development finance. This provides the background for an appraisal where examples are used to give an indication of the possible financial effects of archaeology on development.

PART 1
Archaeological Considerations

1
The development of archaeological thinking

1.1 THE MEANING OF ARCHAEOLOGY

Archaeology means, quite simply, the study of human material remains. More commonly it is thought of as the study of buried remains, standing ruins and other surviving objects of past human activity although the Oxford English Dictionary defines archaeology slightly differently. It states that it involves the systematic description or study of antiquities where the aim is to find out more about different periods of the past.

Some might argue that archaeology is a branch of history but whereas the historian will seek to obtain a picture of all manner of historical events including natural occurrences, a large part of the archaeologist's activity concentrates on humans' past activities and their impact on the landscape. Other life forms are also important, particularly in the prehistoric period, but the archaeologist is primarily interested in the past achievements of humans and how societies and communities evolved over the years. The main aim is to obtain and interpret information with timing, techniques and location forming key elements in this quest for knowledge.

1.2 THE QUEST FOR KNOWLEDGE

The quest for knowledge of archaeology, as we know it today, ostensibly started some 200 years ago. Before then the Bible formed the main source of information about past societies and seventeenth century theologians had calculated the creation of the Earth at 4004 BC. At the beginning of the nineteenth century people were either unable or unwilling to believe the greater antiquity of the human race. To go back before 'the present world' of the Bible was unheard of. It was considered unchristian and undermined the Christian faith, a powerful and compelling influence. It challenged established thinking and needed people of great courage to come forward. Not surprisingly, archaeological study was almost non-existent and grew very gradually.

In effect, it started with the collection of objects such as coins, works of art, pieces of pottery, sculptures and other curios which were being discovered. Many were collected out of curiosity, but as more and more were accumulated people started to ask questions about where they came from, how they were made, what age they represented and so on. Collection was no longer enough.

In this search for knowledge the Industrial Revolution was of fundamental importance. Quarrying for building materials, the building of the canals and later the construction of the railways all resulted in the removal of large volumes of earth. Cuttings exposed all sorts of buried objects lying either just beneath the surface or at various depths in the ground. It also became apparent that deposits of sand, gravel, clay and limestone were the

result of the ordinary deposition of sediments. This was not generally realized until the 1830s, when Charles Lyell (1797–1875) published *The Principles of Geology*. He showed, for the first time, that geological evidence appeared in sequence in a simple undisturbed series of layers. It is said that Charles Darwin (1809–1882) was influenced by Lyell's studies of geology and that they may have formed the catalyst which led to Darwin's general theory of evolution. In any event they posed new questions about the chronology of human societies and how cultures developed. They showed that the history of the Earth was much longer than had previously been realized.

Ironically it was the canal and railway building and other developments which helped to advance archaeological thinking. If development had not taken place the opportunities for archaeological investigation would not have been so great and one conclusion must be that, whilst development can destroy evidence and can be a nuisance, in the advancement of archaeological knowledge it is a necessary nuisance.

As personal wealth increased in the nineteenth century, in part from the growth of industry and commerce, so exploration and excavation were able to expand. Archaeology began to take on a more scientific role with people such as Pitt-Rivers, Evans and Petrie providing new information. They showed that with a methodical approach to excavation and detailed recording, new levels of accuracy and discipline could be obtained. Pitt-Rivers (1827–1900), for example, accurately recorded every specimen and artefact collected, making detailed drawings and descriptions of all excavations. Evans (1851–1941) similarly paid attention to detail, attaching great importance to all finds no matter how trivial. Equally, they recognized the importance of the publication of that detail.

Another key figure was Petrie (1853–1942). As an archaeological surveyor who made the first accurate survey of the pyramids, he developed a system of sequence dating. In his book *Methods and Aims of Archaeology* he set out four principles for archaeological investigation which are just as relevant today:

1. that care must be taken of the monuments being excavated;
2. that special attention must be paid to the collection and description of everything that is found;
3. that detailed and accurate surveys should be undertaken together with careful planning;
4. that all information should be published as quickly as possible.

Of course, not all the early approaches were so scientific. Schliemann (1822–1890), for instance, was more interested in pursuing a particular objective. Fascinated by the stories of ancient Greece and particularly those of Homer's Troy, he set out to find the truth about Troy. He sought to distinguish myth from reality and, in the process, destroyed much of the evidence without making a methodical record. However, despite the different approaches, these examples show a science emerging to confront traditional beliefs. In their different ways they demonstrate an objective approach to archaeology, tending towards a detailed description of data. Making use of scientific methods, they argued that the facts spoke for themselves.

These methods also proved to be successful in the development of techniques. As excavation proceeded and further discoveries were made and published, important breakthroughs in the ability to date the past, the development of aerial photography and

other techniques of investigation were made. However, they revealed a reliance of factual information which some would argue put too great an emphasis on the detailed description of data. In fact, it was becoming apparent that the steady collection of data, in itself, did not appear to be leading to major advances in knowledge. The argument was growing that the pursuit of knowledge could not progress simply as a result of collecting more and more data, but that the development of theory and ideas was equally, if not more, important.

Alongside these developments in archaeology, considerable environmental change was taking place. Social, economic, political and physical factors were all having an impact on where we lived, worked and played. This was especially so after the Second Word War when many war-damaged buildings and sites needed to be redeveloped and new buildings constructed. It was also a time when nationwide land use controls were introduced. The Town and Country Planning Act 1947 required, for the first time, that planning permission be obtained for new development, but an important feature of that Act, which is sometimes overlooked, is that it introduced a system of compensation and betterment. This had the effect of dampening the supply of new buildings although demand continued to grow; the gap between supply and demand grew wider. This continued until the 1950s when the restrictions on supply were lifted. The betterment levy was abolished thereby opening the floodgates for development. Local authorities and developers alike became actively involved in promoting and implementing development projects. A lot of land was cleared for development and many sites earmarked for **comprehensive redevelopment,** a term used to describe large scale demolition and, in many cases, high-rise development. New construction techniques encouraged this and tall buildings became commonplace in many towns and cities, frequently requiring deep foundations.

One site that was cleared for redevelopment in 1954 is where the Temple of Mithras was discovered. Located at Cannon Street in the City of London, it generated considerable public interest, so much so that time was set aside for excavation and public viewing of the uncovered Roman remains. Inevitably there was a delay to the redevelopment of the site but, contrary to popular belief, this only lasted three weeks and related solely to a small part of the site. Some in the development industry, however, saw this as a disaster, which is not altogether surprising considering the uniqueness of the situation. Discovery and delay on anything like this scale had not happened before although they were certain to happen again.

Elsewhere other activities were gaining momentum. Significant among these was a new type of archaeological research project at Winchester. Under the leadership of Martin Biddle, excavations were carried out at a number of sites within the city to establish its historical geography. Detailed investigations were made with great precision and discipline covering a range of historic periods from the Iron Age through to the Roman, Anglo-Saxon and Medieval periods. They provided archaeologists with many new insights and greatly advanced the cause of urban archaeology.

As archaeologists were becoming more aware of what was happening, much of the urban fabric was already in the process of being destroyed. The removal of restrictions in the 1950s together with a booming economy resulted in many buildings being demolished to be replaced by new high-rise buildings, new highways, new underpasses

and other structures. In many towns and cities little regard was paid to their historic character and much that was important historically was destroyed or left to deteriorate. The situation regarding archaeological remains was even worse.

The reaction to this destruction encouraged the conservation movement. It led to increasing calls to protect the environment which were directed initially at saving historic buildings and areas, although gradually extended to archaeological sites. The delay was probably due to the fact that most archaeological remains were hidden underground, in contrast to buildings which, by their very presence, constantly remind us of our heritage. To some extent it will have been a matter of 'out of sight, out of mind'. Certainly this will partly explain why so many archaeological sites were destroyed in the boom period of the 1950s and 1960s. However, by working in an urban environment many in the archaeological world were beginning to realize how much modern developments could damage or destroy archaeological remains and how important some of these sites were.

This destruction helps to explain why many locally based archaeological units came into being in the 1970s. Established primarily to publicize the destruction and to record as much as possible of what remained before it was destroyed, they also sought to rescue the archaeological resource. They were the originators of rescue archaeology.

1.3 RESCUE ARCHAEOLOGY

As the Winchester project was reaching fulfilment, so sites in other towns were beginning to be investigated. By 1970 the total in England had reached 23 and archaeologists were formulating ideas about how to investigate urban sites. New ideas about archaeology were being published in archaeological journals with the effect that minds began to concentrate on how to develop strategies and methods of investigation. As Carver (1987) later reported, three ideas dominated the strategy of the 1970s: 'think big', 'think history' and 'think rescue'.

In many ways these three ideas sum up what rescue archaeology was all about. Many archaeologists were beginning to conclude that the purpose of archaeology in towns was to provide knowledge of their history and that by examining archaeological remains a story of the growth and development of towns could be obtained. In other words, to use Carver's phrase, there was a need to think history.

However, if the history of a town or city was to be established it also became necessary to think big. Within an urban area each site that was and still is investigated can only provide a small part of its history. If archaeologists want to find out more about a town it is necessary to investigate as many sites as possible. In a sense each site is a piece in the urban historical jigsaw where the picture is only revealed when accumulated information is put together.

The problem with history, however, is that it contains many pictures. For every period of history there are different stories to tell, which means that more than one picture is needed if the history of a town is to be ascertained. To get the full story it becomes necessary to extract a whole series of pictures for the different historical periods. It means that just as each site should not be seen in isolation from its surroundings so each period of history should not be isolated from other periods.

In terms of **rescue** this was and is not an easy thing to do. It means that a strategy has to be devised for each historic area. Decisions have to be made about which periods to investigate, where to dig, what to look out for and how to retrive and assemble information. Initially this proved difficult. From 1969 onwards, excavations commenced at sites in many towns and cities such as Chelmsford, Exeter, Nottingham, Southampton, Poole, Gloucester and parts of London. Operating independently of each other, units sought to retrieve as much archaeological information as possible before it was destroyed although they were frequently hampered by lack of money, trained staff and limited resources. Often a practical and pragmatic approach was required such as was beginning to take place in cities like York and London. The York Archaeological Trust, for example, put great emphasis on excavating those sites and strata that were about to be destroyed by new development. At the Museum of London an attempt was made to devise a strategy for excavators to work from.

Of course, these and other units were not without their problems. Pressures to develop land meant that difficult decisions had to be made. Archaeologists in London and York, as in other towns and cities, were often restricted in where they could excavate. They were dependent on the developer, the vagaries of the market in providing sites for excavation and the attitude of the local planning authority. In the 1970s it was difficult to get access to sites and conditional planning consents requiring excavation were rare or non-existent. Few developers could afford the delay and many local planning authorities did not recognize archaeology as a material planning consideration in the determination of planning applications. Meanwhile, urban renewal programmes, redevelopment and new building continued apace.

During the 1970s and 1980s circumstances changed. Many newly qualified archaeologists were appearing on the scene and keen to investigate new sites. By 1981 as many as 124 towns had been or were in the process of being investigated (Carver, 1987) with the growth of interest matched by a growth in excavation. This in turn was matched by a growth of information although this was not always clear at the time. Much was not published and there was a need to analyse existing information. Some archaeologists were also convinced that to excavate as much as possible was not the answer. They counselled change, arguing that there should be a change of emphasis away from simply collecting everything to collecting what was needed and to make it publicly available in the context of an overall strategy. Not all of the changes, however, were to serve the cause or the advancement of archaeological investigation: not initially, at least.

1.4 STRATEGIES IN THE 1980s

The thrust for these changes began in 1979: first by the Labour government's introduction of the Ancient Monuments and Archaeological Areas Act 1979; second, by the new Conservative government's approach after it won the general election later that year.

The calls for greater protection of archaeological sites had eventually worked through the governmental system, although when it came the changes were viewed in different ways. Whilst some considered the Ancient Monuments and Archaeological Areas Act

1979 to be a significant step towards protecting archaeological remains others thought its measures were insufficient to make any real impact.

Principally, the 1979 Act consolidated earlier legislation relating to ancient monuments. Important among the changes to monument protection were the redirection of funding powers towards specified projects and the need to obtain the consent of the Secretary of State for any proposed works to scheduled monuments. Previously owners had only to give three months notice of their intentions to carry out such works.

A new initiative was the extension of protective measures to certain areas known to be archaeologically important. Defined as Areas of Archaeological Importance, the Secretary of State became empowered to designate these areas where this was thought appropriate. Areas in ten historic cities were put forward although only five were chosen for designation, namely Canterbury, Chester, Exeter, Hereford and York. Within these areas time and access (but no money) became mandatory for rescue archaeology.

Immediately after the introduction of this Act the Conservative government came to power. Under the leadership of Mrs Thatcher a whole new policy approach to government was introduced. Politics decreed a lessening of public controls over enterprise and the use and development of land. The market place was to be given a greater say in when, where and how land should be developed.

One impact of these changes was to produce the recession of the early 1980s, leading to a gradual decline of traditional industries with the consequent run-down of large urban and inner-city areas. The relaxation of controls was, of necessity, targeted at these areas, although it was limited. Aimed principally at enterprise zones and urban development areas—which were restricted in number and area—it meant that many other areas received little benefit. The result was that archaeologists had difficulty funding projects and developers were often unable to provide financial support for archaeological investigation. This was not surprising since the main aim was one of supporting the rebuilding of urban areas. Urban regeneration took priority over preservation.

The mid-1980s saw the partial reorganization of local government and further relaxations of control. The GLC and metropolitan counties were abolished, simplified planning zones were introduced, and changes of use from all sorts of industrial buildings to offices were automatically granted planning permission in a new Use Classes Order. When the boom came in the late 1980s the combined effect of these changes resulted in widespread development. Sites in many towns and cities, including historic cities, witnessed a plethora of new buildings.

The problem was not so much that new buildings were being erected. In many cases it was their sheer size and number and the fact that foundations needed to be sufficient to carry the increased loads that were the problem. Deeper foundations, with the occasional underground car park, meant that many archaeological remains were destroyed. In a sense it was similar to the industrial revolution of the nineteenth century and the development of the 1950s and 1960s. The main difference was that the impact on archaeology was recognized which led to increased calls for protection of the archaeological resource.

1.5 A NEW STRATEGY FOR ARCHAEOLOGY

The publication in November 1990 of *Planning Policy Guidance Note 16* (PPG 16) provided a great boost for archaeologists. By formally recognizing archaeology as a material planning consideration in the formulation and implementation of planning policy, it has given the archaeological profession a greater say in the development process and a new strength of purpose. It has meant that archaeological considerations cannot be ignored when development is proposed, although this recognition has not been without its problems.

On the positive side, the PPG has introduced greater clarity of purpose and enabled archaeological thinking to influence and be influenced by the planning process. A logical consequence to investigation is the reduction in need for excavation. By a process of elimination, based on the principle that preservation *in situ* is preferred to recording what is there, the comprehensive excavation of sites now only proceeds as a last resort when deemed necessary.

The problems stem from this greater involvement and relate to expectations and attitude. Differences of opinion as to how archaeological considerations should be taken into account when development proposals affect archaeology can now be detected. There is a feeling among some archaeologists that insufficient attention is given to archaeology when planning applications are determined. They see a number of authorities acting virtually indifferently to archaeology, taking little or no account of archaeological considerations. They complain that insufficient attention is paid to archaeology in comparison to other planning matters. Other archaeologists see things differently. From their experience they find planners responding positively to archaeological interests, although they acknowledge that this response does differ from authority to authority.

In talks with planners and developers the views expressed are often quite different. All see archaeology as one of the considerations to be taken into account in the determination of development proposals although many see other considerations as being more important. Frequently social and other environmental factors carry more weight, the argument being that archaeology has not been ignored but has been given due consideration.

Differences of opinion such as these are not surprising. Different specializations, interests, training and educational programmes generate different expectations with greater importance being given to particular interests. Archaeologists will almost inevitably attach greater weight to archaeological matters in the development process in the same way that planners will put more weight on regulating development in what may be termed the public interest. Developers, intent on making a living by providing buildings and other structures for present day society, will similarly take a different view.

What is more clear is that archaeology and development can no longer be separated. Just as development, as stated earlier, is seen as a recognized nuisance in the advance of archaeological knowledge, so too can archaeology be seen as a recognized nuisance in the development process. The key, however, is to recognize that this nuisance has its limits. Preservation *in situ* is the preferred option, indicating that attention should focus on how to preserve archaeological sites when this is deemed necessary, and on ways of

ensuring that destruction, without recording what is there, is kept to a minimum.

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2
Archaeological investigation

There are many types of archaeological remains of every period. Upstanding remains are the most obvious but many others such as ancient settlements are to be found all over the countryside and underneath our towns and cities. Sites also vary enormously in their state of preservation and can range from well preserved wetland sites to others which are virtually unrecognizable because of the erosion that has occurred. They cannot all be investigated in the same way and different approaches must be adopted in the way sites are discovered or how further information about them may be obtained.

Each of these aspects of investigation is comprehensive, which is why, in this Chapter, the aim is to look at the principles involved in site investigation. The idea is to look first at how sites may be formed in order to give developers and others an insight into where they might be found and how deep finds might be. This is followed by an appraisal of the types of the many sites that may be encountered: records show that there are over 700 000 known archaeological sites in Britain. Large parts of Scotland and Wales, however, have never been surveyed, suggesting there could be more.

Against this background of how sites are formed and what they might consist of, the next stage is to see how they might be found. Several methods of investigation are available ranging from the very simple to the very complex. They include the use of instruments designed to detect what lies beneath the ground without actually disturbing it, although it must be remembered that these cannot provide a complete picture. All information obtained in this way must be treated with caution as archaeological artefacts can be missed and readings misinterpreted. Finally, as part of the investigation there is a need to look at the costs involved and the main factors influencing those costs. The problems associated with excavation are looked at in the next Chapter.

2.1 HOW ARCHAEOLOGICAL SITES ARE FORMED

Why an understanding is important

If we are to find out how archaeology may affect development projects it is important to understand how archaeological sites develop. The more we know about them the better it will help us to tackle the problems that might arise. It should make it easier to understand the evidence that is recovered and lead to a greater awareness of the relative importance of a site. An understanding can also be used to help in deciding how best to proceed and where to make further investigations or where to excavate. This can benefit the advance of research and could be less disruptive of the development process.

The formation of archaeological sites

Essentially archaeological sites are formed in one of two ways. Either remains are deliberately buried or they are buried by accident. Sometimes both occur at the same time and certainly both are helped by nature.

Of the remains that are deliberately buried, by far the most common are interred human remains. Burial mounds, funerary chambers and graveyards regularly occur throughout the land but all kinds of objects ranging from a single pot to a wealth of precious possessions can be buried with or alongside human corpses. In addition, many other remains can be buried deliberately during the life of a community. Rubbish tips and refuse pits are good examples which can reveal a wealth of information.

As far as accidental burials are concerned it is amazing how many occur. Even buildings constructed of stone can disappear from the surface, for once they cease to be occupied disrepair and decay begin: as timbers rot, so doors, windows and eventually the roof will collapse; fallen woodwork will decay more quickly; soil will be blown in and plants take root; vegetation will produce a rich bed for more plants which, together with frost action and the freezing of trapped water, dislodge masonry and stones; walls will start to crumble and so begins an almost endless cycle of natural decay.

In many cases this process of natural decay is assisted by human interference. Ruins of buildings, for example, provide a ready source of stone for further building work without having to search or quarry for it. It is easily accessible which means that the amount of stone can be reduced rapidly thereby accelerating the rate of decay.

Once under the ground decay continues at a greater or lesser extent depending on several factors. These include the acidity and permeability of the soil, the extent to which the ground is waterlogged and, of course, the nature and substance of the discarded objects. Organic matter will decay more quickly than inorganic material so that an object such as a timber post will eventually end up as a dark stain in the earth; iron will rust and cause staining; precious metals will survive more easily. Pottery and stone are the best survivors.

As a rule, the greater the acidity of the soil the quicker the decay. By contrast, the more airtight the conditions the greater the degree of preservation. Thus in wet sites where anaerobic, that is, airtight conditions exist, timber, leather, textiles and plant matter can all be preserved although, when such material is exposed to the air, decay can set in very quickly.

The process of levelling is another factor which has contributed to the formation of archaeological remains. When new buildings were contemplated, not only was masonry taken from sites but many were levelled to provide a platform for new buildings. This could have involved a levelling-up or a levelling-down of the land depending on the topography of the area. Undulations in the ground or valley sites and the proximity to a river may have resulted in the filling in of land to avoid flooding. Sometimes restrictions on the removal of debris will have resulted in a gradual rise in ground level. Chester is a good example where this has occurred, although the process will vary from town to town and within different parts of the same town.

The age of a town and its importance during different periods of history will also affect the depth of deposits. For example, at Aylesbury, where Medieval deposits exist, strata

can be found at depths of 1–1.5 m (3–5 feet) whereas in Droitwich, which has Roman origins, remains can be as deep as 5 m (16 feet) below ground (Carver, 1987). Thus, the formation of archaeological sites will depend very much on the length of time remains have been left untouched, soil conditions, the underlying natural topography and the length and period of occupation.

2.2 TYPES OF ARCHAEOLOGICAL REMAINS

Prior knowledge of the type of archaeology to expect at a development site will be of considerable benefit in assessing its importance. It can help archaeologists and developers to assess what it will mean in terms of time, money, effort and the use of other resources.

Sometimes the nature and importance of an archaeological site will be instantly recognizable, but more often it will not. Clues, however, will be present. The location and character of an area can provide useful information. They can tell us why a site was established and perhaps why it continued or failed to continue to flourish. For instance, it may have been located for defensive reasons (a prominent elevated site), as a focal point for communications (at a river crossing), as a site for agricultural production, or because of its proximity to timber or minerals. By studying the character and nature of the surrounding area it should be possible to get an idea of why a site was established. English Heritage have recognized the importance of this by identifying eleven main types of area or topographical zones where different types of archaeological sites might occur (English Heritage, 1987):

1. Wetland and waterlogged areas

Sites in these areas were often used as hunting grounds and sources for food and raw materials. They are where wood, leather, rope, spears, spades and many other finds have been found, which, when studied and properly analysed, have helped to build up a picture of the climate, vegetation and wildlife encountered by earlier generations. The fact that they are waterlogged has meant that material in them has usually been well preserved although when exposed to the air they tend to decay quickly. From an archaeological point of view they should be kept wet or covered with vegetation to prevent drying and erosion by the wind.

Important wetland areas include the Somerset Levels, the Fens of East Anglia, the Humber Basin, other low-lying areas and many mires and bogs in northern Britain. Much in the north has not been surveyed.

2. The coastal zone

For thousands of years the coastal zone was the point of entry and exit for Britain. It formed a line of defence and was also a major communication link and a source of raw material. Accordingly, evidence of a wide range of past human activity can be found in this zone: castles and fortifications for defence; lighthouses and harbours for transportation and trade; and salt-pans and fish traps as reminders of exploitation for food.

The coastal zone is an area which has not received a lot of attention in the past but coastal and other erosion and a growing awareness of the potential of this area, particularly for leisure and recreation purposes, indicate that it is likely to be an area

of increasing importance in the future. English Heritage are currently showing an interest in the zone.

3. The offshore zone

This is another area of increasing interest. Apart from many historic wrecks, the topography of the inshore sea bed may contain a variety of information that is well preserved. Estuaries and other intertidal areas such as the Solent are places where evidence of earlier occupation may be found. Headlands and other dangers to navigation may also prove fertile ground for archaeological investigation, with other territorial waters (within the 12 nautical mile limit) tending to be less significant.

4. Rivers and lakes

Rivers and lakeland sites have always provided food and raw materials. As a means of and as barriers to movement and communication they have also formed a focus for human settlement providing a wealth of archaeological information. Types of remains associated with riverside occupation include bridgeheads, centres for fishing, the locations of markets and associated activity and habitation.

Riverside sites are also prone to deposition of mud and silt, especially after times of flood. Layers of alluvium can build up and hide earlier remains with the result that archaeological remains may be well preserved. Care should therefore be exercised when rivers are dredged or river banks cut back, excavated or improved.

5. Old pastures

In prehistoric and Medieval times land in England was commonly used for grazing purposes; less so in Scotland and Wales. Beneath it many forms of archaeological sites can be found because of the nature of this use of land where the shallow root systems of grass and turf have helped to preserve them. Some of the best ancient field systems are to be found in these areas together with deserted villages, means of enclosure, boundary dykes, old tracks, Roman camps and castles. Many of these sites remain in reasonable condition because the land is still used for grazing purposes.

6. Ploughed landscapes

More land is used for farming than for any other use and it is not therefore surprising that ploughed landscapes should contain a wealth of archaeological sites. These can range from earliest prehistoric farmland enclosures to buildings of the Middle Ages. Roman occupation was also common in these areas and many villas and temples were built within them and may still be found. Larger settlements have also been unearthed and deserted towns and cities can lie beneath the soil. Some of these sites stand out as islands within a sea of cultivated land, but the majority are hidden from view. Occasionally, ploughing may bring remains to the surface or even destroy them. Some sites may be revealed by crop marks, which are referred to later.

Many rural areas are now well documented although there may still be gaps in the archaeological record. Wessex and East Midlands are two areas that have been extensively investigated. Elsewhere the record is not so thorough, indicating that we can, in the short-term, expect to see regional and chronological imbalances, at least until the Monuments Protection Programme is completed (Chapter 6). Landscapes that have only recently been ploughed are likely to contain better preserved sites and may therefore be a focus for attention.

7. Woodland

In earlier times, woodland covered much of the country. Timber was a widely used resource and created much employment. It was a ready supply of fuel which led to the introduction of early industrial processes such as charcoal burning, pottery making, woodworking and basketry. Iron-smelting and quarrying activities were often located in or near woodlands.

Woodland sites and particularly ancient woods are likely to contain a wealth of archaeological sites. These can include hill-forts, camps, boundary earthworks and hunting lodges. Roads and settlements were also built to service the above crafts and industries.

8. Lowland heaths

The lowland heaths in evidence today were largely created by over-exploitation of the soil. This was begun in prehistoric times by early farmers, primarily in southern England. Settlements and burial mounds show that occupation was widespread during the period 2000–1000 BC.

Later prehistoric times saw the establishment of enclosures, hill-forts and small industrial sites in what were discovered to be mineral-rich areas. Potteries, brickyards, peat-drying and even mining and quarrying activities have all been found to exist in these areas. Timber may have been one of the resources over-exploited in these areas.

9. Upland areas

Whilst many upland areas today appear desolate and inhospitable this has not always been the case. When the climate was warmer than it is today many upland areas were relatively densely populated areas, particularly in the south-west of England such as on Dartmoor. A variety of activities took place in these areas and, because stone was the main building material, much of the evidence from these periods is still visible. Barrows, enclosures, stone circles, cairns, hill-forts, settlements, field systems, mines and other remains have all been found.

Surveys carried out in the north of England have shown that new earthworks may be discovered in areas threatened by forestry, reservoir construction and other large-scale developments. The same could equally be true in Scotland where many prehistoric sites are known to exist.

10. Industrial landscapes

Bearing in mind that the industrial revolution began in Britain it is not surprising that there should be widespread interest in industrial heritage. Today, however, the interest goes beyond the industrial revolution and three types of industrial landscapes are regarded as being particularly important.

The first concerns the metal-extraction industries. Britain was renowned for lead mining in the Roman period and the concern today appears to centre on advancing our knowledge of the scale, character and duration of such early and subsequent metal-extraction industries.

The second area of interest is water power. Whilst the canals of the eighteenth and nineteenth centuries today generate much interest from the development industry as a focus for urban renewal it is the use of water as an early power source that is regarded as archaeologically important. Water-mills of all types and descriptions, the

different ways in which they were used, and how water was managed through ducts, channels and even lifted are subjects for investigation.

Thirdly, there is an interest in the manufacturing processes used during the industrial revolution. The ways in which energy was generated and how machines were used for one or more purposes are increasingly seen as important in our post-industrial society. Many people now desire to find out how things were done and how one innovation led to another. Today, interest is growing in the agriculture, charcoal, chemical and extractive industries, engineering and manufacturing processes, the transport and distribution industries and water, sewerage and other services.

11. Townscapes and urban areas

Many modern towns and cities are the product of centuries of occupation. Most came into existence in the ninth and tenth centuries, initially as centres of defence and later developing into market towns. Market charters or borough status began to appear in the late twelfth and early thirteenth centuries which encouraged settlements to grow and expand. Distinctive street patterns emerged and when a new building was required it was usually constructed on the site of an earlier building, making use of its foundations for support. Much of the archaeology was, and still is, close to the surface.

There is now a realization that all historic towns, whatever their size, can provide a wealth of knowledge about the past. Indeed, historic townscapes are now one of the most important areas for archaeological investigation although there are limits to what can be achieved. The random and haphazard manner in which sites are brought forward for development make it unrealistic to expect that many sites can be examined. The opportunities to investigate are limited suggesting that an overall strategy be put in place, relating not just to the town or city but to wider geographical areas.

2.3 HOW SITES ARE DISCOVERED

Myth has it that archaeologists have a hunch about where to dig and are rewarded with fantastic discoveries. In practice the situation is very different. Basically, archaeological sites are discovered either by accident or by design. They can be discovered by anyone (they often are) and it does not have to be an archaeologist who finds them.

Many sites are already known. They stand out above the ground and are visible for all to see, like Stonehenge, or they are hidden but their presence is nevertheless evident because of the lie of the land. We may sense that something is there but we are not quite sure what it contains because the site has not been excavated. Many sites fall into this category.

A large proportion of newly discovered sites are found by systematic fieldwalking. Others are found by accident depending largely on how the land is used and whether it is being altered in some way. In open countryside discovery can be from ploughing, quarrying, dredging, construction works or by erosion. Many Roman villas have been found after ploughing. Quarrying and dredging operations have been important in revealing prehistoric finds such as fossils, and new motorways and trunk roads have

sometimes been notorious in unearthing important finds.

In other areas site evaluations will generally indicate what to expect although accidental discovery can still occur. As bulldozers begin to clear and prepare a site for development, unexpected finds can sometimes be revealed. For example, at Alington Avenue, Dorchester, initial investigations from a magnetometer survey and trial trenching carried out in 1985 suggested little in the way of significant finds (Figure 2.1). It was only when development was about to commence that substantial remains, including many human burials, were discovered. Further investigation revealed a far more complex site, as can be seen from Figure 2.2, where over 50 human corpses were discovered. Discoveries such as this will, today, be rare because of the ways in which site evaluation is undertaken. Nevertheless, unexpected finds can still occur indicating the need for caution and early research.

Desk-top studies

A desk-top study will initially involve the archaeologist in an examination of many documents and records including old library and archive material, maps, ground and aerial photographs, manuscripts and, for coastal and

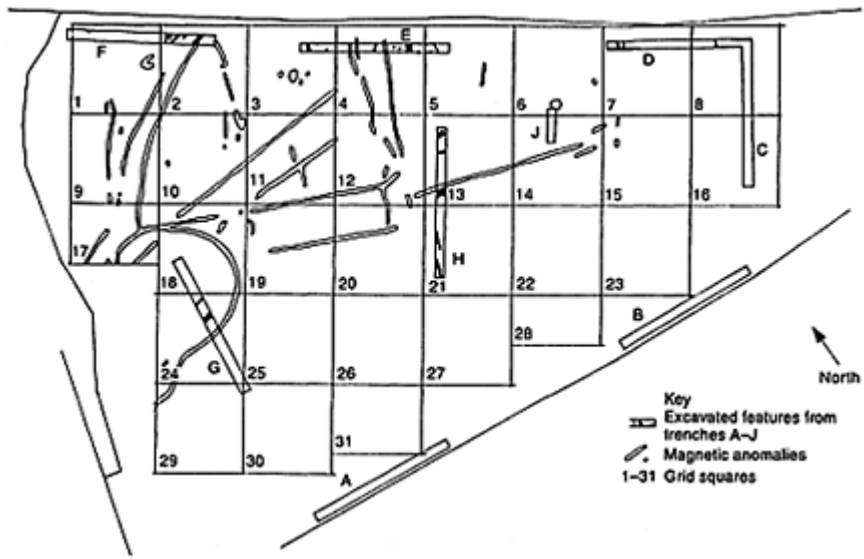

Figure 2.1 Alington Avenue, Dorchester: results of trial trenching and magnetometer survey. (Source: Wessex Archaeology.)

inshore areas, old charts. These will frequently help to identify the location of burial grounds, forts, hamlets, parishes, field boundaries, long-established lanes, footpaths and other signs of past human activity. Early editions of maps may indicate the position of former buildings at a site and original field names may provide clues about earlier occupation. Some names may suggest earlier discoveries of building debris (e.g. Chapel

Field, Tile Field) or activity (e.g. Kiln Field). Old charts may similarly indicate the position of wrecks or former watercourses where early occupation or activity occurred. Aerial photographs can also be useful in this respect, as shown in Figure 2.3. An interesting feature about this photograph is that the modern farms are not just located alongside the modern fenland road but are adjacent to the former watercourse which can be identified.

Many archaeological sites have been excavated over the years with varying degrees of success and with varying amounts of information recorded. This, however, is to be expected. Apart from the obvious fact that different sites contain different amounts of detail it is also likely that thoroughness of investigation will not always have been the same. GIS, however, may change all this. The York Archaeological Assessment (YAA), for instance, can rapidly produce data combining archaeological information with other criteria such as topography and cityscape (Miller, 1994).

One aspect of record keeping that could be very useful is borehole logs

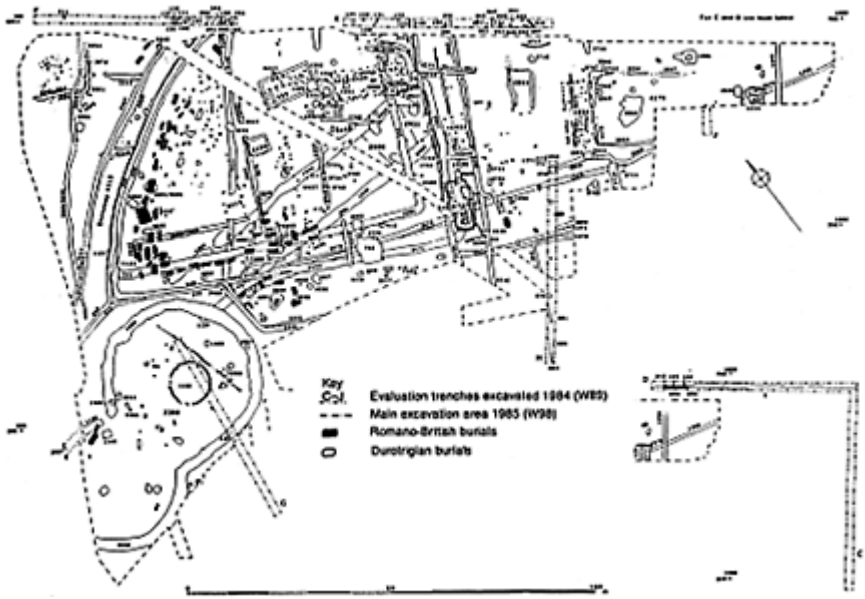

Figure 2.2 The Dorchester site after excavation. (Source: Wessex Archaeology.)

Figure 2.3 Soil marks at Littleport, Cambridgeshire: an example of soil marks where the lighter toned silt of the former Little Ouse river which dried up in the seventeenth century is clearly visible. Note the siting of the modern farms within the broad banks of accumulated silt. (Reproduced with permission from Cambridge University Collection of Air Photographs: copyright reserved.)

supplied by developers or, in some cases, landowners. Such information could provide evidence of occupation, or lack of it, thereby saving time and money. The desk-top study should, of course, identify statutory protection and local policy issues, most notably local planning policy, and should be undertaken at the earliest opportunity. It is far preferable to do this at the assessment of feasibility stage rather than at the expensive detailed planning stage.

The Sites and Monuments Record (SMR)

The SMR is a comprehensive local authority record of known archaeological sites in Britain. It is compiled largely by archaeologists employed in local government working in conjunction with the government's national heritage departments and agencies (English Heritage, Historic Scotland and Welsh Historic Monuments (Cadw)), and it forms the basic source of information about all known archaeological sites and spot-finds in the area of each local authority. In England the records are usually kept by the county council although in London and the metropolitan areas the situation is different. In London the SMR is maintained and administered by English Heritage and in the other metropolitan areas the SMRs are jointly maintained by the metropolitan boroughs. In Scotland the records are kept by most of the regional councils and elsewhere by Historic Scotland. In Wales four archaeological trusts (covering the whole country) are responsible for collecting this information: these are Clwyd-Powys Archaeological Trust, the Gwynedd Archaeological Trust Ltd, the Dyfed Archaeological Trust Ltd and the Glamorgan-Gwent Archaeological Trust Ltd.

The SMRs generally identify and include whatever information becomes available and are constantly updated as a result of casual finds, excavations, aerial photography and other survey work. They form an invaluable service to developers, landowners and consultants who wish to find out more about sites, what they contain or what may be expected.

SMRs normally contain five main components:

1. Ordnance Survey base maps on which are plotted archaeological sites and finds;
2. other maps and drawings at various scales detailing specific information about individual sites;
3. a database (often computerized) which summarizes what is known about given sites and where additional information may be found;
4. photographs including aerial photographs, photographs of survey work or photographs used to monitor site excavations and conditions;
5. drawings and other graphic material.

One of the aims of SMRs is to distil what is known about the archaeological potential of any given site and to direct enquirers to other sources of information. In this respect the computerized database—Figure 2.4 provides an example—is often produced and given to enquirers.

Fieldwalking

Fieldwalking is the word used to describe the systematic collection of artefacts from the surface of the land and frequently cultivated fields. If and when discoveries are made, or where some parts of a field or area appear more promising or more accessible than others, a system of recording is used to enable others to locate the position of finds at a later date. Recording what is found is also important because it can be used to establish the density of those finds and suggest areas for further investigation or where to undertake a sampling strategy. It would also be useful to record the position of any buildings and give

an indication of the levels involved. Time of year and recent ploughing will indicate the circumstances in which finds were discovered.

The method of recording would normally be based on a grid system set out either in line with the orientation of the field to be surveyed (as in Figure 2.5)

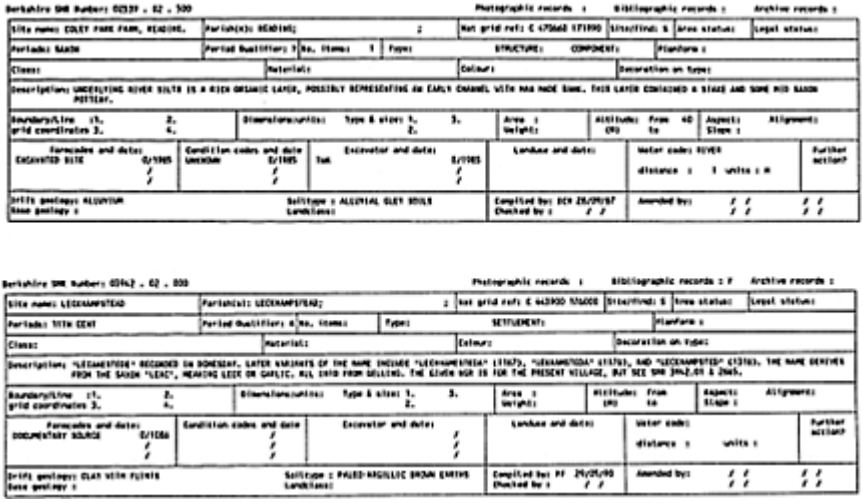

Figure 2.4 Extracts from the Berkshire SMR. (Reproduced from records of Berkshire County Archaeologist.)