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THE DEVELOPMENT OF A METHODOLOGY FOR CREATING AN EARTHEN BUILDING INVENTORY

FORD, MARGARET LYN

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University of Plymouth

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M. L. FORD

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THE DEVELOPMENT OF A METHODOLOGY FOR CREATING AN EARTHEN BUILDING INVENTORY

by

MARGARET LYN FORD

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ABSTRACT

THE DEVELOPMENT OF A METHODOLOGY FOR CREATING AN EARTHEN BUILDING INVENTORY

Margaret Lyn Ford

This thesis addresses the issue of cataloguing traditional earthen architecture. It proposes a methodology that will permit the systematic collection and analysis of objective and quantifiable data relating to historic earthen, or cob, buildings in a parish in mid Devon.

The brief given for this project requires a multi-disciplinary approach to be taken, one that considers the topographical surroundings and the historic context of the buildings as well as the architectural characteristics. A triangular concept is expounded, with the three elements providing a sound basis for the development of an holistic methodology for creating an earthen building inventory.

To comply with the requirements of the brief, a comprehensive review of a wide range of relevant literature is described. Historic and current literature on the use of earth as a constructional material is considered, as well as literature on landscape history and historic documentation. The rationale is that a broad based understanding of the key elements will guide the selection of data for inclusion in the proposed inventory database.

Data included in existing methodologies, devised for inventorying historic buildings, is assessed, and the necessity to develop a methodology to manage cob buildings is evaluated. The selection of the study area, the parish of Sandford, in which to demonstrate the proposed methodology, and the collection of the descriptive and the spatial data relating to the cob buildings is explained in detail.

The use of a relational database, linked to a Geographical Information System, to collate the collected data and the results achieved from analysis is fully described and discussed. The potential use of the methodology as a powerful conservation tool, indicated by the results of case studies undertaken, is also considered.

The conclusions drawn are that the developed methodology represents the first systematic study on cob buildings in Devon, and that the important results achieved, and discoveries made, present a distinct and significant contribution to the current knowledge of cob buildings in mid Devon.

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Chapter Four -The Study Area and the Development of The Proposed Recording Methodology using a GIS

Chapter Five - Examples of Analysis on the Collected Descriptive and Spatial Data using a Geographical Information System

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ACKNOWLEDGEMENTS

This project was undertaken in order to develop a better understanding of the regional earthen architecture of Devon; the buildings constructed of cob. The University of Plymouth awarded a research studentship for the study and further financial assistance was given to enable attendance at relevant courses and conferences in England, France, Spain, Italy and Morocco.

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The assistance of Frances Griffiths of Devon County Council and the staff at the Record Offices in Exeter and Barnstaple is gratefully acknowledged, as is the kind permission granted by the following authors and publishers to use material illustrated in Chapter Three. CraTerre-EAG, Grenoble, France; Direcção Geral dos Edificios e Monumentos Nacionais, Lisbon, Portugal; Mr. I. Bowman, Wellington, New Zealand; Edizioni Cogestre, Penne, Italy; Faber and Faber, London; Dr. N. Alcock, Leamington Spa; Mrs. I. Richardson, National Trust, Somerset; Mr. J. Thorp and Dr. J. Cox, Exeter; English Heritage (see below).

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AUTHORS DECLARATION

During the course of this study, the author has attended courses related to architectural conservation: a residential international course on the preservation of the earthen architectural heritage held in Grenoble, France; a residential English Heritage summer school on techniques used for measured surveying and post graduate lectures in architectural conservation at the School of Architecture at the University of Plymouth.

A review of a Buildings at Risk Survey for the Exmoor National Park Authority, Ford (1996), served as a background to using a computerised cataloguing system for Listed buildings.

Concurrently with the preparation of this thesis a number of papers and lectures relevant to the topic have been prepared and presented.

Four publications chart the development of the methodology. A paper introducing the proposed project was presented at the Out of Earth Conference II (Ford and Watson 1995), a paper discussing the use of the methodology for conservation strategies was presented at the 5th International STREMAH Conference (Ford et. al. 1997), and a paper outlining the relevance of the methodology to the evaluation of vernacular architecture was published in the Journal of Architectural Conservation (Ford et. al. 1999). A poster depicting the varied sources of literature that refer to cob was presented at the Terra 2000 international conference (Ford 2000), and an internal report for the Centre for Earthen Architecture at the University of Plymouth expands on the sources and content of this literature (Ford 2002).

In addition to the above publications, a contribution has been made to current European discussions on earthen building conservation by the giving of illustrated lectures in England, France, Spain and Italy.

The author has made visits made to earthen buildings in the United Kingdom, France, Italy, Morocco, Australia and New Zealand. Information gained from these visits contributed to the author's knowledge of methods of recording and inventorying buildings and provided an insight into the global context of earthen buildings and the role of Devon's regional cob buildings within that context.

Further background information on the topic of this thesis is available from the Centre for Earthen Architecture, (CEA), Joint Schools of the Built Environment, School of Architecture, University of Plymouth. For example, the CEA holds copies of the papers by the author and of the internal report on the sources of information and literature considered relevant to the study of the development of this inventory of cob buildings.

Signed Margaret L Ford

Date August 8th 2002

CHAPTER ONE – INTRODUCTION

This thesis looks at cob* buildings, the traditional earthen buildings of Devon, and presents a way of cataloguing this regional form of architecture that includes the location and the history of the buildings as well as the architectural details.

The author's interest in cob buildings started with the purchase, in 1970, of a seventeenth century farmhouse in North Devon that was in need of repair. The house was described by the estate agent as built of local materials. Most of the walls were, in fact, constructed of cob. From this introduction to cob an interest grew in the history, use and demise of this once ubiquitous constructional material that had previously been commonly used for the vernacular buildings of the locality.

From a background in rural resource management and from studies of estate, farm and Listed* buildings within Exmoor National Park, (Ford 1992, 1993, and 1996b), the author has gained an awareness of the importance to the region of traditional buildings, including cob buildings. The award of a research studentship, by the University of Plymouth, to develop this inventory methodology presented an opportunity to study and appreciate these fascinating regional earthen buildings in more detail.

It is a misconception to think of earthen buildings only as primitive dwellings in remote and dry areas of the world. The actuality is that most continents, including Europe, have a long heritage of using earth to build houses and other structures (Guillaud 1994). Examples of the global use of earth are shown in the photographs in Figure 1.1[1].

* see Glossary

[1] Enlargements of the photographs are included in Appendix One

Concern for the preservation of this world-wide architectural heritage has been voiced since the early 1970s when the initial International Conference on the Study and Conservation of Earthen Architecture took place in Yazd, Iran in 1972 (Balderrama 1992: 2; Fidler et al. 2000: viii). Research into this area was led by the International Centre for the Study of the Preservation and the Restoration of Cultural Property (ICCROM), (Houben 1994).

In the early 1990s, building and architectural practitioners in the United Kingdom, concerned at the lack of cohesive action to prevent the continuing deterioration and loss of indigenous earthen buildings, formed regional groups. These included the Devon Earth Building Association (DEBA), the East Anglian Regional Telluric Houses Association (EARTHA) and the East Midlands Earth Structures Society (EMESS). These organisations have encouraged the continued use of earth as a building material as well as promoting the conservation of regional earthen architecture.

Vernacular architecture may be defined as buildings that are constructed in local materials to local traditions, as opposed to polite architecture which has been designed to follow national or international fashion or conventions. Regional buildings may display both vernacular and polite qualities (Brunskill 1988: 26).

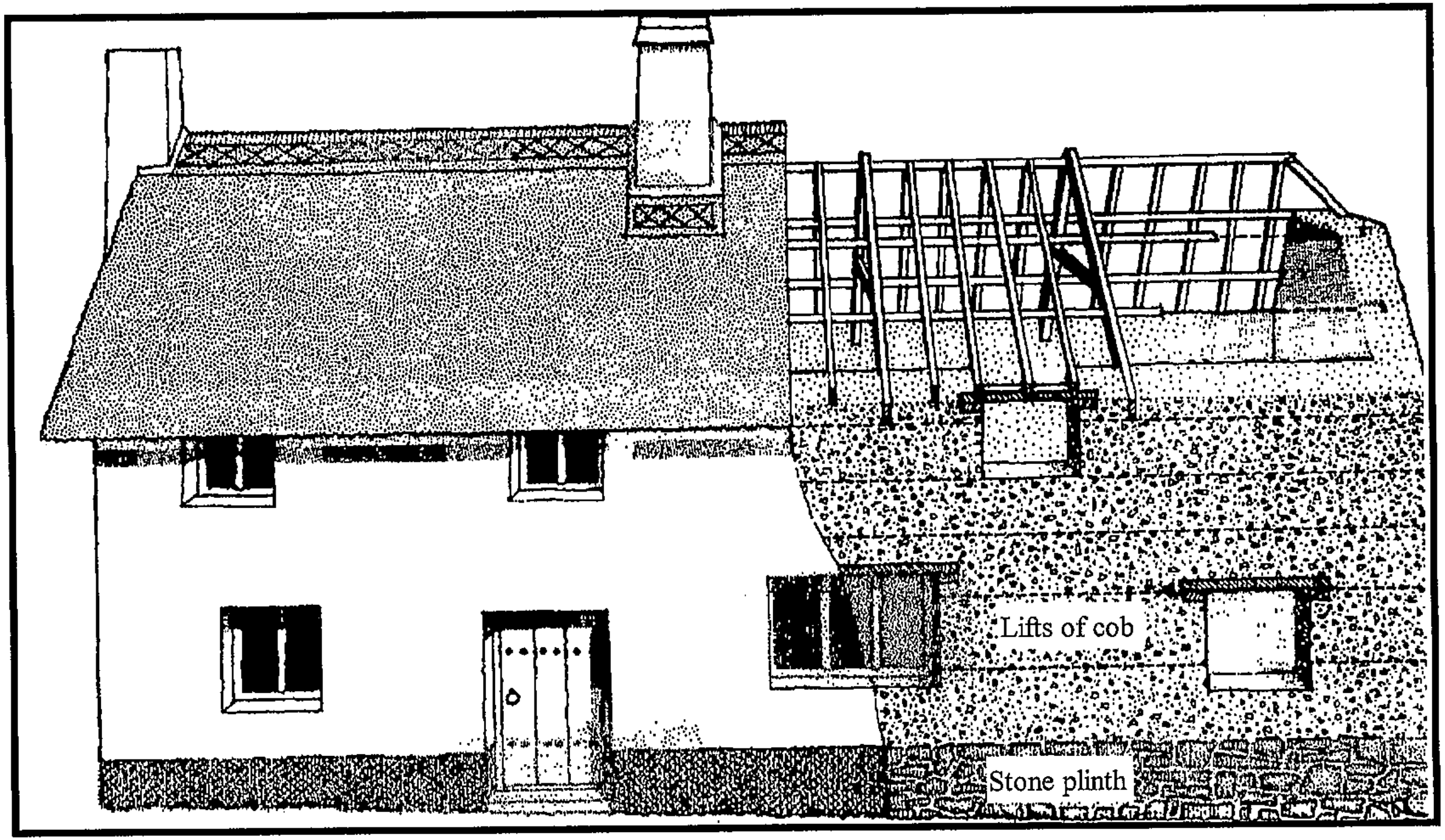
In Devon the regional earthen buildings are termed cob buildings. Cob buildings can be seen throughout the county and do indeed display both vernacular and polite qualities. Examples include manor houses, farmhouses, farm buildings, seaside terraces and even a village school. Illustrations of Devon cob buildings are shown in Figure 1.2[2].

[2] Enlargements of the photographs are included in Appendix One

The term cob is ambiguous, and may cause some confusion, as the word is used to describe both the construction technique and the constructional material from which the buildings are made. Cob walls are constructed using unbaked earth to form monolithic load bearing structures: the earthen material, composed of a mixture of subsoil, straw and water, is placed on a stone plinth and built up in horizontal layers, each of which is allowed to dry before the application of the next layer (Keefe 1992: 1). This is illustrated in the diagrammatic drawing of a cob house shown in Figure 1.3.

It was the lack of quantifiable information about the use of cob that prompted the establishment of the Centre for Earthen Architecture at the University of Plymouth in 1992. This multi-disciplinary group included personnel from the Joint Schools for the Built Environment, the School of Materials, Manufacturing and Mechanical Engineering and the Department of Geology. The aims of the group were to ensure that the heritage of earthen building in the west of England is maintained, and that earth is promoted as a viable contemporary building material.

In 1994 the Centre for Earthen Architecture hosted a conference, Out of Earth I, (1994). At this conference the Earth Structures Committee, a sub committee of the International Council of Monuments and Sites UK (ICOMOS-UK), was launched with the purpose of fostering interest and awareness in earthen architecture and its conservation.



Drawing by L. Keefe

Figure 1.3 Diagrammatic drawing of cob house showing stone plinth and horizontal layers, or lifts, of cob walling material

The committee highlighted the numbers of earthen buildings that are distributed throughout the British Isles and identified potential areas of study. Research areas undertaken to date include studies on the mechanical properties (Greer 1996 and Coventry 2001), on the thermal properties (Goodhew 2000), and on the pathological properties (Keefe et al. 2001), of the material. The development of a methodology for the construction of an inventory of cob buildings represents a further research area in the ongoing study of earthen buildings.

The brief

The research brief for this cob study required that a methodology be developed that describes, analyses and characterises earthen buildings in a given geographical area in central Devon, a methodology that will allow for the distribution of earthen buildings to be related to the geology, geography and building tradition of the area. A methodology that can also provide the basis for a national inventory system for earthen buildings throughout the United Kingdom. The brief also required that a comprehensive literature survey be undertaken and that relationships between the earth buildings, underlying geology and settlement patterns in the study area be identified and described, with the results compiled into a series of interrelated thematic maps.

No previous systematic study has been undertaken of cob buildings in Devon and, in order to fulfil such a wide ranging remit, it is necessary to take a broad and multi-disciplinary approach. The approach taken considers potential relationships that may exist between cob buildings and their topographical and historic contexts.

The differing contexts are visualised as a triangle surrounding the cob buildings: the three sides of the triangle representing the architectural elements, the topographical factors and the historic aspects. This is graphically illustrated in Figure 1.4.

The objective of the thesis is to incorporate this triangular based concept into a systematic methodology to create an earthen building inventory. To complete this potentially large task a number of aims need to be identified and a suitable geographical study area selected.

The Aims

The first and central aim is to explore the notion that in describing and locating cob buildings it is important to consider topographical and historical factors as well as the architectural elements of the individual buildings.

The second aim is to identify sources of information that will assist in achieving the primary aim, that identify the role of cob buildings within the context of differing earthen building techniques, that relate buildings and settlement patterns to topographical factors and that discuss the use of historic documentation.

The third aim is to undertake a critical review of a typical selection of existing local, national and international recording procedures, or methodologies, used for heritage sites and historic buildings and thereby to identify an appropriate methodology for this study of cob.

The fourth aim is to construct an inventory of cob buildings, in a selected study area, and to explain how the proposed methodology can fulfil the requirements of the original remit.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

The fifth aim is to demonstrate the inventory and its possible applications and to explore ways in which it may be used as a conservation and research tool. This will be supported by detailed case studies of selected cob buildings.

The sixth and final aim of the project is to consider ways of improving the methodology and of widening its application both as a predictive and a conservation tool for cob buildings.

The study area

The brief required that the location of the study area should be in central Devon, a district where cob has been an important traditional building technique and where the conservation officer for Mid Devon District Council has been concerned for the survival of the cob buildings within the area (Stocks 1995). For this project certain criteria are required of the selected study area: it will need to contain a number of known cob buildings and will require relevant small scale topographical and geological maps and archival records, relating to the area, to be available. The proposed methodology presents a complex undertaking and for this reason a relatively small study area will be necessary.

Platform for the Inventory

To construct an inventory of cob buildings for the selected study area will entail the collection and storage of diverse sets of information. It follows, therefore, that a suitable platform for the inventory will be a computer based data handling system and, for this purpose, the use of a Geographical Information System (GIS) is considered appropriate.

A GIS has been defined as a computer based system that allows geographically referenced data to be stored, manipulated, analysed and displayed (Wu 1997: 123), and is capable of integrating spatial and text based databases (Gillings and Wise 1998: Section 2.4). It is anticipated that by using a GIS it will be possible to develop a methodology for inventorying cob buildings that will be capable of relating the architectural elements of the buildings to their location and history.

Structure of the thesis

Pertinent literature relating to earthen buildings, topography and historic documentation is explored and discussed in Chapter Two.

This identification of sources of information and literature is principally required to be investigative, rather than critical. The aim is to gain a better understanding of the subjects underlying and informing earthen buildings in general, and cob buildings in particular, and of relationships that exist between buildings and their physical and historical backgrounds. It is also aimed at identifying apposite data from the literature reviewed for inclusion in the proposed cob building inventory. This review of literature will demonstrate that vernacular earthen buildings have not previously been considered in relation to their wider topographical or historic contexts.

Chapter Three will critically examine existing methodologies for inventorying buildings to see whether these have the capacity to incorporate topographical and historic factors. The type of data storage systems that have been used will be identified and an argument put forward that there is a need for an alternative recording methodology for inventorying cob buildings.

Chapter Four will describe the selected study area. The smallest administrative unit for the purposes of civil government is a parish and it is this unit that usually forms the basis for the categorisation of cartographic and documentary reference material. For this reason a single parish in central Devon, Sandford parish near Crediton, will be used as the study area. Chapter Four will also describe the development of the inventory methodology using a GIS.

Results obtained from using the inventory will be described and illustrated in Chapter Five and further uses of the inventory will be demonstrated in a series of case studies described in Chapter Six.

The conclusions reached as to whether the proposed methodology for creating an inventory of cob buildings is of value and fulfils the requirements of the brief will be discussed in Chapter Seven. The question as to whether or not there is a role for a GIS system in the development of such an inventory methodology will also be discussed.

CHAPTER TWO - LITERATURE SURVEY

Introduction

The brief for this cob study required that a wide ranging and comprehensive literature survey be undertaken on the subject of earthen buildings. The aim of the survey is to identify sources of information that will support the concept that it is important to consider topographical and historical factors as well as architectural elements when describing and locating cob buildings. The literature considered, therefore, relates to earthen architecture, landscape development and historic documentation. The focus of the review is investigative rather than critical, an information gathering exercise that will allow a better understanding of cob buildings. The literature survey will also direct the selection of appropriate data for inclusion in the projected cob building inventory database.

Differing sources of literature have been chosen for, as Johnson (1993: ix) and Rackham (1986: 6) both suggest, the study of houses is cross disciplinary and evidence about buildings and landscape needs to be corroborated from as many sources as possible.

Not all the literature that has been considered is essential to the understanding of this thesis, even though the greater part consulted contains information that may be of importance for the future study of cob buildings. As a consequence, only literature pertinent to the current project is reviewed in this chapter and a more detailed account of the material considered has been prepared as an internal report for the Centre of Earthen Architecture at the University of Plymouth, entitled *Sources of Literature Relevant to the Study of Cob Buildings* (Ford 2002).

In the first section of the review, global, European, national and regional literature on earthen buildings is introduced. Emphasis is placed on work describing the use of earth as a building material in the United Kingdom, particularly that relating to the construction of cob walls. The next section reviews literature that relates to the study of landscape, in particular to the study of settlement patterns and the history of landuse. The chapter concludes with a review of references to different types of documentation. Literature and historic documentation that relates directly to the study area is discussed in Chapter 4.

Literature relating to the global and European use of earth as a building material.

This section considers literature on the global and European tradition of using earth as a building material. Various authors, whose work is referred to below, discuss the historic use and comprehensive distribution of earthen structures and the differing constructional techniques used. (A glossary of the accepted meaning of the terms used to describe earthen structures is included at the end of the thesis. Words that are included in this glossary are marked with an asterisk).

Williams-Ellis comments on the long history and worldwide use of earth as a traditional building material (Williams-Ellis 1920: 4). Houben and Guillaud ratify this comment and suggest that earthen buildings have been and still are, lived in by at least one third of the world's population (Houben and Guillaud 1994: 3).

Facey also categorises unbaked earth, with stone and wood, as one of the world's oldest building materials and refers to evidence of its use in structures ranging from individual dwellings to complete early settlements. As an example he comments on the fact that parts of the Great Wall of China are built solely from earth (Facey 1997: 10-12).

Houben and Guillaud (1994: 8) consider that the history of building in earth is not well documented. They consider that this may be due to the historic perception of the material as inferior in comparison to stone or wood. This, despite the fact that in early civilisations earth was the primary choice of building material. They give examples of sites that have provided archaeological evidence of early earthen buildings including those in the valleys of the Tigris and Euphrates and at the Necropolis at Thebes (Houben and Guillaud 1994: 9). They quote a description by Pliny, written in the first century, of walls of rammed earth built by the Phoenicians in Spain (Houben and Guillaud 1994: 10).

Within the African continent earth has been in use since before the establishment of the Egyptian dynasties and is still the building material of common use. This is demonstrated by the differing vernacular earthen architectural styles of Nigeria, as described by Gella (1994: 7), the decorated earthen buildings in Burkina Faso, illustrated by Rainer (1994) and the earthen buildings of Mali, including the city of Timbuktu, described by Ould Sidi (1994). The red earth city walls of Rabat and the archaeological remains of mosques in the Atlas Mountains, excavated by Messier (1996), also illustrate the use of earth for substantial structures in the northern part of the continent.

In the Americas earth, as a building material, was also widely used historically. According to Guillaud (1994), the use of sun baked bricks is recorded as early as 500BC in Central America and a cob technique was used by certain American Indian cultures. The same author also describes large adobe* built residential houses in the thirteenth century Aztec city of Tenochtitlan (Guillaud 1994). The massive adobe* walls that were used in the construction of the eleventh century Peruvian city of Chan Chan are described by Chiari (1994), and Boyer (1992: 11) describes both archaeological and historic sites in New

* see Glossary

Mexico where earth has been used for walls, floors and plastering. Taylor (1994) describes the construction of nineteenth century earthen forts in Texas, and Crocker (1992: 10) discusses the number of late eighteenth and early nineteenth century adobe* churches in New Mexico. Further west, in Arizona, the tradition of building in adobe is illustrated by Vint (1996) who describes the eighteenth century earthen architecture of the town of Tucson. As well as the historic use of the material, earth continues to be used as a building material in Arizona today, including its current application for the construction of architect designed adobe houses (Vint 1996).

Evidence of earth building skills are found in Australia. Lewis (1977: 38) considers that these skills are likely to have been transferred to Australia from the United Kingdom. He describes references to early settlers using mud and thatch* to build their homes in a manner similar to that of cob construction. Wilkinson (1994: 62) states that wattle and daub* was also used, as were mud blocks* similar to those found in East Anglia. Houses with pisé* walls, built in an adaptation of the Picturesque* style, are recorded in Melbourne in the early part of the twentieth century (Serle 1995: 13). Post Second World War settlers were encouraged to build their own earthen houses with the help of self build manuals such as those by Middleton (1953). The use of earth as a current building material is demonstrated in Gippsland, Victoria, where techniques used include post and beam* constructions with earthen infill and housing built with moulded bricks (Ford 1996a). Similar systems are described in Western Australia by Mold (1996), and at Coober Pedy in South Australia by Oliver (1994: 9-11).

The transfer of earthen building skills from different areas of the United Kingdom is also apparent in New Zealand. Lewis (1977: 40) suggests earth was considerably cheaper than

* see Glossary

other materials and that it was used in the Canterbury Plains, on South Island, from the time of the early settlers. Bowman (1986: 18-21) describes standing examples of pioneer settlers' houses that date from the mid-nineteenth century. Some of these are constructed using cob; others are pisé structures or use a technique similar to the clay lump* buildings of East Anglia. Many of the early cob buildings in South Island are likely to have been derived from English and Irish cottage design (Ward 1986: 12). Although the use of cob for larger houses was rare, there are still surviving examples of substantial houses, built of the material, in certain areas, including the town of Nelson (Ford 1996a).

In Europe earthen buildings are found throughout the continent and there is literature available that describes its use in most countries. In France, Houben and Guillaud (1994: 11) suggest that prior to the introduction of baked brick during the Roman occupation, unbaked earth was a widely used building material; in the eighteenth century cob and rammed earth* became the most common form of earthen construction and this practice continued throughout the nineteenth century.

Conti et al. (1999: 160) suggest that earthen constructional techniques, seen on the Adriatic coast of Italy, may have originally been imported from the Balkan countries. Early nineteenth century examples of earthen buildings in Italy include architect designed country houses as well as humbler peasant properties (Aymerich 1996).

In Germany, buildings with solid clay walls are described by Guntzel (1994: 3) who states that this tradition has been used since the early Middle Ages and that there is archaeological evidence to indicate that it may have been used since the eighth or ninth century. Kleespies (2000: 137) suggests that the tradition of using earth to construct

* see Glossary

buildings was transferred to Switzerland from France in the seventeenth century. In Hungary, earth is described as the building material of choice from the seventeenth century until the mid-twentieth century (Cseri 1994: 46).

The continuity of use of earth as a building material is demonstrated by the resemblance between the wall paintings of Thebes, which depict the art of creating bricks from unbaked earth in 15BC (Facey 1997: 11), and the work of Hassan Fathy who used similar techniques to construct a twentieth century village near Cairo (Gale 1996).

The above literary references describe the use and distribution of earth as a building material. Only a small selection of the literature consulted has been mentioned, but from this an impression may be gained of the variety of constructional techniques employed by which unbaked earth is, and has been, utilised for building throughout the world.

Houben and Guillaud (1994: 5) have identified and quantified these different construction techniques.

They describe eighteen different techniques which form three major groups, ordered according to the way in which the material has been used.

A: Earth used as a monolothic load bearing structure.

B: Earth used as pre-formed bricks bonded to create a load bearing structure.

C: Earth used in conjunction with a load-bearing frame.

Cob structures are considered to belong to Group A. As well as cob construction, pisé*, or rammed earth*, is a commonly used technique in this group. Group B structures include those constructed by using shaped, unbaked earthen bricks, such as adobe*, and those built with cut blocks of earth. Group C refers to earth used in conjunction with timber frames, usually in the form of infill panels*. Examples of all three techniques are found throughout the world and within the United Kingdom.

Methods of construction that belong to Group A and are similar to that used for cob walls occur in different parts of the world.

For example, Facey (1997: 91) remarks on the similarity of the techniques used in Saudi Arabia and the Yemen to those of the cob cottages of Devon, particularly in relation to the building up of the monolithic walls in layers, or lifts, without the use of shuttering*.

Bertagnin (1999: 76) describes the technique used in the regions of Marche and Abruzzo, on the Italian Adriatic coast, where earth is used to construct monolithic load bearing walls that also bear a similarity to cob walls, and Vellis (1996) has described methods used in the Poitou-Charentes Region in France where cob, or bauge*, buildings are prevalent in the former marshes around Montcontour.

Guillaud (1987: 4-6) gives detailed descriptions of the earthen buildings in the Région Rhône-Alpes of south-east France where monolithic walls, constructed of rammed earth, are used for all types of buildings, from simple farm outbuildings to prestigious and large private houses and public offices.

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* see Glossary

As yet, there is no single work that collectively depicts or describes European earthen architecture, but references to earthen buildings and building techniques in Europe and throughout the rest of the world may be sourced to the Centre of Documentation at The International Centre for Earth Construction at the School of Architecture in Grenoble, France. In conjunction with ICCROM, the Centre has also published a bibliography of publications on the preservation, restoration and rehabilitation of earthen architecture (CRATerre EAG 1993).

Literature on the use of earth as a building material in the United Kingdom

The United Kingdom has a rich heritage of earthen buildings. There are regional differences, depending on the constructional technique used, but collectively, all are built using unfired earth.

In Scotland examples include clay buildings in Angus, turf buildings in Caithness and the United Kingdom's largest earthen structure, the Roman Antonine Wall (Walker and McGregor 1996: 3).

Further south, regional names identify different constructional techniques. There are the clay dabbins* of Cumbria, the mud and stud* of Lincolnshire, the clay lump* of East Anglia, the chalk block* buildings of Wessex, the clunch* cottages in Berkshire and the wichert* cottages in Buckinghamshire as well as the clom* of West Wales and the cob* of Devon, Dorset, Somerset and Cornwall.

* see Glossary

References to the use of earth as a walling material in the United Kingdom have been found in historic documents but it is not until the late eighteenth and early nineteenth century that descriptions are found of the actual process of building in earth. McCann (1983: 14) attributes this dearth of earlier information to the lack of interest in the dwellings of the common people by contemporary writers.

References to earthen buildings, discovered during this search for relevant material, were found in diverse sources including early topographical accounts, agricultural surveys, articles in agricultural and other journals and the architectural pattern books of the eighteenth and nineteenth century.

Carew, writing on Cornwall in the early seventeenth century comments on cob and thatch being used for the home of a cottager (Halliday 1953: 124), and Fiennes, travelling through Devon in the late seventeenth century, describes the siting of earthen buildings in the landscape (Morris 1982: 199). Marshall (1796) when discussing the rural economy of the south west of England in the late eighteenth century, describes cob buildings in the landscape and Vancouver (1808: 95) also provides information about earthen buildings in his agricultural reports.

Reformers, such as the Reverend Copinger Hill (1843: 356), describe the use of clay and sun dried clay bricks to build good, reasonably priced accommodation for rural workers. Architects and designers, including Papworth (1818: 14-16), describe the use of cob, or pisé* for the construction of small estate buildings, including a gardener's cottage.

* see Glossary

Similarly, Loudon (1836: 74) describes several methods of using earth, including pisé* and compressed mud blocks*, for the construction of all types of rural buildings.

Existing examples of estate buildings in England, built in earth, are described by Darley (1975: 12) and, in Scotland, by Walker and McGregor (1996: 33). Innocent (1916: 10-11) describes the varying methods of using earth for buildings in Lincolnshire, Dorset, Buckinghamshire and Hampshire and also the timber-framed buildings in Norfolk where earth was used in conjunction with strips of wood, to create infill panels*.

The architect, Clough Williams-Ellis, describes the use of earth as a constructional material in his 1920 publication *Building in cob, Pisé and Stabilised Earth* (Williams-Ellis 1920). His work was written to encourage the use of available and inexpensive materials for the building of houses after the First World War. The work was revised, in collaboration with the Eastwick-Fields, and republished in 1947 following the Second World War. In this publication the construction methods of pisé*, clay lump*, chalk mud* and cob are described in detail and contemporary examples of the use of pisé* and cob are given (Williams-Ellis and J. and A. Eastwick-Field 1947).

Regional earth building techniques in the United Kingdom represent all three major groups described by Houben and Guillaud (1994). These are buildings where earth is used to create a monolithic load bearing structure, or where pre-formed earthen bricks are utilised, or where earth is used as an infill within a load bearing frame.

*see Glossary

Examples of the technique of using earth to construct solid walls are found in many English counties. Pearson (1992: xii-xiii) discusses the use of clay and chalk in Hampshire and Pearson and Nother (2000: 29-34) give details of constructing chalk and chalk mud* load bearing walls in parts of Dorset and Hampshire. They identify the use of these materials in the building of houses, cottages, farm buildings and other structures from the eighteenth, nineteenth and twentieth centuries.

Messenger (1994: 24; 2000: 8) describes an area in Cumbria where walls are constructed in a similar way but where the earth is interspersed with layers of straw. Walls constructed with and without formwork* or shuttering* in Scotland are described by Walker and McGregor (1996: 45, 60), and similar buildings in Wales by Nash (1994: 37). In Ireland load bearing monolithic walls are found as well as examples of walls constructed of pre-formed earthen bricks (Oram 2000: 42).

Earthen structures that also use pre-formed unbaked earthen bricks to create load bearing walls, can be recognised in the clay lump* buildings of East Anglia. These are described by Bouwens (1994: 19-21) who states that evidence of this method of earthen construction is seen in a variety of rural building types in Norfolk and Suffolk.

The use of earth in conjunction with a load bearing frame encompasses the many instances where earth is used, as a daub*, with strips, or wattles*, of wood to create infills for internal partitions. Brunskill (1988: 13) illustrates examples of this technique. These infill panels are common in several geographical areas including the counties of Norfolk and Suffolk (Wilkinson 1995: 188).

* see Glossary

Hurd (2000: 13-14) describes a composite method, found in Lincolnshire, where load bearing walls are formed by a matrix of wooden vertical posts, woven with horizontal wattles covered with an earthen mixture. These mud and stud* walls are similar to examples found in Scotland (Walker and McGregor 1996: 38-40).

A recent publication: *Terra Britannica: A celebration of earthen structures in Great Britain and Ireland* (2000), presents texts on the current situation in regard to regional earthen buildings in the United Kingdom (Hurd and Gourley (eds.) Terra Brittanica 2000).

As well as the literature that describes specific constructional techniques, earthen buildings are referred to in descriptions of regional architecture.

Clifton-Taylor (1972: 287) categorises regional architecture by the material from which the buildings are constructed. He considers unbaked earth to be a material used for humble domestic and agricultural vernacular architecture which, at one time, was widely used in England.

Mercer (1975: 133-136), in his survey of rural vernacular architecture, considers buildings across England, linking them by the criteria of form and material. He, like Bouwens (1994), describes the differing methods of earthen construction employed in various regions including the East Anglian technique of using a clay and straw mix to form large blocks, referred to as clay bats* or clay lumps*. Mercer is of the opinion that unbaked earth may have been used at a high level of society in certain areas. A similar observation is made by Barley (1986: 189-190) who believes that in some regions in the sixteenth, seventeenth and eighteenth centuries earth was used by the relatively wealthy, but that in

* see Glossary

most places it was the material of the poor, and when cheap mass produced bricks became available, in the nineteenth century, it was no longer used. Barley (1986: 34) also refers to the need for collaboration between geologists and archaeologists to understand how local building materials were sourced and how far they could be transported. Barley (1967: 725) suggests that evidence from parochial terriers indicate that parsonages were often built in local vernacular material including earth.

The Penoyres (1978: 21) refer to the distinctive appearance of farmhouses and cottages built of earthen material in their regional study of vernacular styles of building in England and Wales. They describe the use of chalk in various forms including the chalk/clay mixture which occurs in certain areas and is described by the term, wichert*.

Literary references specific to the use of cob as a constructional material.

Eighteenth and nineteenth century references found in the work of agricultural surveyors provide information on the numbers, types and spatial distribution of cob buildings in the county of Devon. Many of these early references to cob refer to the use of the material for the construction of cottages, particularly low cost labourer's cottages as well as for farm buildings, with occasional references made to its use for larger residences.

Marshall (1796: Vol. II, 97-121) describes the buildings in the countryside around Exeter as being constructed from red earth and thatch and comments on the fact that these materials were used for domestic and agricultural buildings as well as for garden and farmyard walls. He gives descriptions of materials used in the construction of cob and also

* see Glossary

identifies particular areas in South and North Devon where there was a prevalence of cob buildings (Marshall 1796: Vol. I, 46,48,71,81).

These references confirm the existence of different types of cob buildings and structures and indicate that earth was used as a flooring material, and for plastering, as well as for constructing walls.

A letter written by Swete (1798) also refers to the universal use of cob in the region. He states that the majority of farm and village houses in Devon were of cob construction.

Vancouver (1808: 95), reporting for the Board of Agriculture, refers to the mid Devon region and gives details of the amounts and costs of materials and the construction techniques adopted in building in cob. Similarly to Swete, the inference from Vancouver's survey is that the use of cob was widespread and that it represented a sensible and cost effective building material.

Loudon (1836: 416-418) considered earth to be an economical material to use for farm buildings and refers to the durability of well built cob walls in Devon. He gives a full account of building in cob, which is partly attributable to earlier authors, and gives details of the heights of the stone plinth*, the thickness of the walls, the most suitable earthen material to use, the tools required and the problems that may be encountered. The practice of using cob walls for the provision of protection and support for fruit trees is also commented on (Loudon 1836:417). Evidence of this use has been seen, by the author, in Devon and in Wiltshire.

* see Glossary

An article by Copinger Hill on cottage construction appeared in the *Journals of the Royal Agricultural Society of England* in 1843. This contains a full and detailed report on building cottages using cob: the amounts of material needed, the preparation of the materials prior to construction and the techniques employed in raising the cob walls. Copinger Hill (1843) considered that cob was a valid building material for rural cottages and gives comparative costs for building in cob or in stone. This article demonstrates the acceptance of cob as being of equal value with stone or brick for the building of cottages. The measurements that Copinger Hill gives for the height of the stone plinths* and the thickness of the walls are comparable to those suggested by Loudon (1836). Copinger Hill's article was intended to demonstrate the possibilities of providing well built cottages, at an economic cost, which might be let to tenants for a rent that they could afford. He refers to the necessity to build cottages for both families and the aged, that would be spacious, warm and damp free (Copinger Hill 1843: 368).

Twenty years after Copinger Hill wrote his article, a report on the advantages and disadvantages of different materials for the construction of cottages appeared in the same journal. In this article a comment is made that mud walls were dry and warm but that they were also susceptible to rodent damage (Taylor 1863: 569).

It was from another agricultural journal that a further early reference to the use of cob is made, but in this case it is from the County of Wexford, Ireland. Martin Doyle, writing in 1868, refers to an account of farmhouses, farm buildings and cottages built of clay, that had appeared in the Irish Farmers Journal of 1814. In this article, the methods of construction, the measurements given and the tools described are similar to those used in Devon (Doyle 1868).

* see Glossary

Innocent (1916: 136-137) refers to the use of a dung fork* and a cob parer* as essential implements for use in constructing cob walls. Although Innocent's description of the process of building in cob is similar to that of the earlier writers, there are variations. He considered that the time it took to build a house in cob was dependant on the rate of drying and quotes a saying that he attributes to Devon: that in order to survive a cob house needs the equivalent of a good hat and a good pair of shoes. Similar comments are made by other historic authors on cob, including Loudon (1836: 77), and indicate an awareness of the need for the base of the wall to be a well built stone or brick plinth* and for the roof to incorporate wide eaves for the protection of the walls from water penetration.

Clough Williams-Ellis (1920) refers to cob being in use in Devon until shortly before the time he was writing. This implies that the regional skill was already in danger of being lost at that date. As with Loudon (1836) and Copinger Hill (1843), Williams-Ellis describes the methods of mixing and using the cob material for the construction of walls. He, like others, endorses the enduring properties of cob and reiterates the need for good foundations for the walls and a sound, protective roof. He also uses the allusion of a hat and boots to describe the importance of a sound roof and a good plinth*: *"Give un a gude hat and a gude pair o'butes"* (Williams-Ellis 1920: 112).

Williams-Ellis (1920: 84) refers to substantial historic properties in Devon that were constructed of cob, including Hayes Barton, the birthplace of Sir Walter Raleigh in 1552, and Fulford House at Great Fulford. He also describes a house, Coxen, that was built in East Devon by the designer Ernest Gimson in 1911 with walls constructed of cob (Williams-Ellis 1920: 94).

* see Glossary

At the same period of time that Williams-Ellis and Innocent were writing, two articles appeared in the *Transactions of the Devonshire Association*. In the first, Joce (1919: 170-171) compares the advantages of using cob to construct local buildings in preference to the use of mass produced materials. He proposes that, when numbers of buildings are required, it is better to use pressed or moulded blocks of earth. He was ahead of his time in suggesting that these blocks would be of use not only for new build but also for the repair of old buildings.

In the second article, Laycock (1920: 159) discusses the loss of traditional Devon cob farmhouses, by fire, neglect, alteration and inappropriate repair techniques, including the use of cement blocks. His illustrated descriptions of traditional large Devon farms, or bartons, surrounded by a courtledge, or courtyard, of buildings, demonstrates the survival of substantial farmsteads that were constructed of cob. Reference is made to the importance of cob garden walls to provide warmth and frost protection to fruit trees and to the use of recesses in cob walls for bee-boles*, and for dovecotes* (Laycock 1920: 169-170).

Laycock comments on the problems of dating traditionally built farmhouses by architectural style, as influences originating in urban areas were not adopted in rural districts until many years later, if at all. As well as measurements of plinth* heights and wall thickness he gives descriptions of architectural features to be found in traditional cob farmhouses, including details of windows, doors, door hangings, fittings, mouldings and decorative plasterwork (Laycock 1920: 172-174).

* see Glossary

Laycock's article highlighted the destruction and alteration of many cob farmhouses, a process which escalated following the passing of the Housing (Rural Workers) Act in 1926. In a report on cottage conservation in Devon, Shears (1968) graphically illustrates the effect of this Act. Door openings and windows were altered, dormer windows were added, internal walls were rebuilt and original fabric was lost.

Following the publications of the early part of the twentieth century there appears to have been a shortage of literature on the subject of cob buildings until there was a resurgence in interest in vernacular buildings, including those constructed of cob, in the middle of the century. Certain publications were re-issued, including that of Addy, whose 1898 work on *The Evolution of the English House* was reprinted in 1933. In 1947, following the Second World War, the work of Clough Williams-Ellis was revised, in conjunction with the Eastwick-Fields, and reissued (Williams-Ellis and Eastwick-Field J. and A. 1947).

Further references were found in work published from the 1950s onwards. Hoskins (1954: 268) refers to the antiquity of earthen buildings and comments on the numbers of surviving Tudor cob farmhouses in Devon. He agrees with Laycock (1920) that it is likely that the thickness of a cob wall is indicative of age, with the thicker walls being the older. He asserts that, prior to 1850, the majority of farmhouses and parsonages in the eastern part of Devon were built of cob and that it was in even more widespread use for cottages (Hoskins 1954: 268). Hoskins also comments on the distinctive colourings of cob walls, which relate to the soil from which they are made, the reddish colouring that derives from soil that overlies the red sandstone (Permian-Triassic) and the buff coloured walls from soil of the culm measures. Writing in the early 1950s, Hoskins (1954: 269) regards the use of earth for building construction as being historic and believes that the practice ceased nearly a century before.

Alcock (1972: 3) describes the county's stock of old houses as historic documents able to demonstrate the building techniques, craftsmanship and social and economic influences of their time. He believes that cob as a building material only has significance in Devon and that there is little documentation existing as to its survival and spatial distribution. He categorises cob walls by the height of the stone plinths*, which may be up to six feet in height and comments that the plinths* of earlier cob buildings will be in material local to the area of origin (Alcock 1972: 7).

Alcock appealed for the systematic recording of surviving historic buildings, of all materials, in part of a series of papers relating to Devon farmhouses published in the *Transactions of the Devonshire Association* in 1968 and 1969. These articles refer to buildings partially or wholly constructed of cob that contain features that may indicate origins, development and status (Alcock 1968 and 1969).

Hulland (1984: 127) also refers to surviving mid-sixteenth century earthen vernacular buildings in Devon and considers that the buildings that remain from this period represent the best built and strongest of their type. He illustrates how certain features in the roof carpentry, particularly in the types of jointed cruck* trusses used, may help ascertain the date of these houses.

Alcock and Hulland (1972: 35-36) suggest that there are unlikely to be any surviving labourer's cottages from prior to the late seventeenth century. The buildings that have survived were originally the houses of higher status yeoman or husbandmen and the reason for the survival of numbers of medieval farmsteads in the mid Devon region is due to the durability of the cob walls combined with the robustly constructed roof timbers. They also

* see Glossary

underline the importance of the use of documentation in identifying past ownership and use.

McCann (1983) published a descriptive account of earthen construction techniques that includes references to the origins and distribution of earthen buildings. In this he highlights some of the problems encountered in attempting to identify cob walled buildings from external examination. He suggests that sixteenth and seventeenth century cob manor houses and farmhouses in Devon may have their original building material concealed by external and internal plastering. Identification therefore, has to rely on features such as the depth of window reveals* or the presence of stone plinths*. McCann (1983: 19) also suggests that many later cob houses were built to more classic designs and do not have the distinctive curved corners of earlier cottages.

Beacham (1990: 17) comments on the use of cruck* construction and high quality carpentry and explains the structural relationship between different types of crucks* and the cob walls. He considers cob to be the most prevalent method of mass wall construction in rural Devon during the period between the fourteenth and nineteenth centuries and, like earlier writers, he emphasises that this walling material was used for a range of different building types (Beacham 1990:18). He suggests the reason cob may have been regarded as a superior building material in Devon was due to the stability of the clay sub soils on site (Beacham 1990: 21).

Child (1990: 61-94) describes the function of different types of agricultural buildings and illustrates the use of cob for constructing a variety of these, from large threshing barns* to cartsheds, and outside privvies*. He explains the evolution of the buildings and illustrates

* see Glossary

further features that may assist in the dating of existing farmhouses, such as the evidence of internal jetties* and the presence of moulded beams, panelled walls and plank and muntin* screens. Keefe and Child (2000: 38) stress the urgency of recording these traditional buildings before they disappear, or are altered beyond recognition.

The need to understand and conserve regional earthen architecture was the purpose underlying the establishment of the Devon Earth Building Association (DEBA). The literature that DEBA have produced is aimed at achieving these objectives (Ley 1997).

The need to conserve cob buildings in Devon has similarly been considered by the Devon Historic Buildings Trust, who have published papers on the history, building techniques and repair of earthen structures within the county (Keefe 1992 and 1993).

Other literature on the conservation of cob buildings includes the studies of the work accomplished at Bowhill, a Listed* (Grade I) small manor house in Exeter which dates from 1500. The use of cob in the construction of the house indicates that it was considered a suitable material for this Tudor middle gentry dwelling, although stone was used for the prestigious rooms (Harrison 1999).

In summary, the examples given of literature on the use of cob as a building material illustrate changing attitudes that have occurred over at least two centuries. Marshall (1796) and Vancouver (1808), writing independently at the end of the eighteenth century and the beginning of the nineteenth century, describe cob as an ubiquitous material used for the construction of urban and rural housing and for agricultural buildings. Later nineteenth century literature, including that of Loudon (1836) and Copinger Hill (1843), describe the

* see Glossary

methods of mixing and using the material and support its value as an economically viable alternative to other materials, but consider it predominantly of use for the construction of cottages.

By the early twentieth century the emphasis in the literature has changed from descriptions of cob as an historic material to an interest in using the material for new build, as demonstrated by Joce (1919) and Williams-Ellis (1920). This interest in new build continues to be reflected in the literature of the latter part of the twentieth century, combined with an awareness of the necessity to understand and conserve the surviving earthen building heritage.

Conferences on earthen buildings in the United Kingdom, entitled Out of Earth I and Out of Earth II, took place in 1994 and 1995. A further international conference, Terra 2000, was held in Torquay, Devon, in 2000. Papers from these conferences demonstrate regional and national variations in earthen building typologies in the United Kingdom and illustrate different methods of construction and conservation.

The literature considered has given an insight into buildings constructed of unbaked earth; particularly those built with monolithic earthen walls similar to the traditional cob structures of Devon. The discovery, in earlier literature, of detailed descriptions of constructing cob walls and the suggestions given of quantities of materials, comparative costs, optimum thickness of the walls and heights of plinths* is of considerable importance to the future study of cob buildings. Detailed descriptions from these references have been collected into the separate internal report for the Centre of Earthen Architecture at the University of Plymouth referred to in Chapter One (Ford 2002).

* see Glossary

In addition to gaining knowledge of earthen buildings, the relevance to this thesis of the review of literature on earthen buildings has been the identification of items important to include in the proposed inventory database for cob buildings. This has enabled factors that relate to spatial distribution, sources of suitable building material, relationships between walling material and roof structures and mechanisms by which the age, development and former status of buildings, to be quantified.

The reviewed literature on earthen buildings shows a tendency to focus on descriptions of typologies, materials and techniques. Less regard is taken of the corresponding topographical or historic contexts.

In order to identify which topographical elements may be of potential importance to the siting of cob buildings, and therefore of value for inclusion in the proposed database, it is necessary to consider literature relevant to the history and development of landscape and settlement patterns, particularly that related to Devon. The following section reviews examples of such literature.

Literature relating to landscape

From the mid-sixteenth century onwards, early topographical writers describe the landscape and its settlement patterns. Brayshay (1996: 1-34) classifies this genre of writers by the different viewpoints from which the landscape is described, by historians, by travellers and by agricultural surveyors. Brayshay considers the value of studying these past writers to be in the way in which they illustrate the development and evolution of local landscapes over periods of time.

John Hooker of Exeter, referred to by Youings (1996: 52) as a scholar and a gentleman from the mercantile elite of Exeter, published a county history of Devon in 1599/1600. Blake's transcription of this work gives an understanding of the landscape of Devon at that time: a prosperous, self sufficient county with a thriving economy based on agriculture, the woollen trade, the mining industry and supplying the needs of the navy. From information given by Hooker it is estimated that there were noblemen, gentlemen and a considerable number of yeoman farmers living in the area around Exeter at the close of sixteenth century (Blake 1915: 334-348). The likely prosperity and probable wealth of these inhabitants would indicate that domestic and farm buildings would have been substantial and well built.

Sandford, the selected study area for this project, is recorded by Hooker as being famous for the production of woollen worsted material and the parish is described as containing good alluvial river land and south facing pastures (Blake 1915: 345). Thomas Westcote, writing in approximately 1650, confirms this when he describes the valley of the Creedy River, at Sandford, as being particularly fertile (Oliver and Jones 1845: 294).

Risdon wrote a Survey of Devon in the early part of the seventeenth century which was not published until 1714. His work is of particular interest in that there are references made to three of the most significant cob buildings in Sandford: Creedy, Dowrish (sic), and Ruford (sic) (Risdon 1630c. Facsimile, 1970: 672). Risdon is quoted by Chapple, writing in 1785, as giving a date of 910 for the Bishop of Devon's see moving from Bishops Tawton to Crediton and 1050 as the date that Bishop Leofricus moved the see to Exeter. These references are important to the understanding of the prebendary* farmsteads in the study area that paid tithes or taxes, to the Bishop at Crediton (Chapple 1785. Facsimile, 1970).

* see Glossary

The Lysons brothers, Daniel and Samuel, were writing in the late eighteenth and early nineteenth centuries. The last volume of their *Magna Brittanica* was published in 1822 and concentrated on Devon (Lysons and Lysons 1822). Todd (1996: 96) considers this work to have been the best description of Devon to that date as it was based on both documentary evidence and topographical observation.

Early travellers described the landscape they passed through. These included Leland in 1542 (Chandler 1996), Shaw in 1788 (Chope 1918), and Fiennes, whose travel diaries of the late seventeenth century are described by Morris (1982).

Board of Agriculture surveys gathered data on regional resources and existing agricultural practices (Wilmot 1996). Devon was surveyed by Robert Fraser (1794) and by Charles Vancouver (1808). In between these, William Marshall (1796) produced an independent survey of the West of England, based on direct observation.

Although the main focus of Marshall's work is agricultural, he also gives a graphic account of the area from a variety of other perspectives, from landscape and landownership issues to mundane observations about diet and the behaviour of farm labourers. The descriptions of the amounts of arable land, grassland, and orchards in the Exeter district, near the study area, illustrate the likely surroundings of the buildings of the parish at that date. References to the production of dairy produce indicate that it would have been likely that there were a number of farmsteads within the area.

As Brayshay (1996) has noted, the value of these historical descriptions is in the portrayal of the landscape at the date of writing. The way settlements were sited, the kind of farming being practised and the types and uses of buildings are factors of importance for consideration as items for inclusion in the proposed database. These facts are further discussed in later studies and theories on settlement patterns and historic landuse by writers such as Hoskins (1954, 1955), Darby (1973a) and Roberts (1987, 1996).

Hoskins was a historian who constantly refers to the need to view landscapes from an historical as well as a topographical point of view. He wrote extensively on landscape issues and his many publications included *The Making of the English Landscape,* (Hoskins 1955). This publication was considered by Beresford (1983: 108) to be the first work that explored landscape history as a subject in its own right. Butlin (1993: 133) suggests that this is a seminal work on the study of landscape history which reflects the approach that the history of the landscape needs to be supported by documentary research as well as by conscientious fieldwork. For the purposes of this project *The Making of the English Landscape* (1955) provides the background to the subject and Hoskins' earlier work, *Devon* (1954), the regional detail.

Hoskins (1954: 54) concludes that the Devon landscape, as we know it, dates primarily from the Anglo Saxon period and mentions that Sandford, the study area, was likely to have dated from the earliest days of Saxon occupation. Hoskins also comments that certain farmstead sites, including sites in Sandford, were described in an Anglo Saxon Charter of 930. This Charter is also referred to by Rose-Troup (1942: 238). Hoskins suggests that the larger villages, such as Sandford, were likely to have outlying hamlets and farmsteads. He agrees with Collingwood and Myers (1937) that historic farmsteads in Devon were likely to be sited on a valley slope facing south or south-east, sheltered but exposed to the sun and close to a source of clean water. In his introduction to the 1992 commemorative edition of *Devon* Beacham (1992: xxii) comments that Hoskins was one of the first to realise the importance of farmsteads to the history of the locality.

Hoskins (1954: 70) discusses the rise in population that led to an increase in building prior to the 1348 outbreak of plague. A later period of increased house construction and reconstruction occurred in the sixteenth and seventeenth centuries, which he relates to the profits made by Devon landowners from the woollen trade (Hoskins 1954: 62). Such is the case in Sandford, where the major estate owner, John Davy, (1541-1611), was a wealthy woollen merchant. The re-structuring of earlier buildings, Hoskins (1954: 160) warns, may lead to misconceptions as to original dates with apparently seventeenth century buildings concealing much older parts.

Hoskins (1955: 146) raises interesting points in regard to certain elements in the landscape directly related to the larger landowners, including the establishment of private chapels and the division of large holdings as a result of inheritance (Hoskins 1955: 146). Evidence of two private chapels, both built in cob, occur in Sandford (Reichel 1922: 272) and one of the larger farmsteads is quoted as having been divided into multi-ownership (Munday 1985: 53).

The increase in buildings and trade Hoskins (1954: 151) associates with the creation of better road systems in the eighteenth century, which in turn caused the rebuilding of bridges and the construction of toll houses* and milestones. He describes the arrival of the railway system in Devon in the nineteenth century which, he considers, led to the availability of non local construction materials and the demise of local styles of buildings (Hoskins 1955: 268). In this he is supported by Morriss (2000: 20) who also comments that, until the advent of the railways, building was dependent on local materials.

* see Glossary

One of the most relevant aspects of Hoskins work is the argument he makes that evidence from informed observation of the landscape and from historic documents helps identify early sites and settlements, and that the identification of such sites gives an indication as to where existing, potentially important, historic buildings may be located.

A *New Historical Geography of England*, edited by Darby (1973) includes the work of contributing authors contemporary with Hoskins, and allows for comparisons to be made with his ideas on landscape development and settlement. The authors include Darby, Glassocks, Baker and Emery.

In his contribution, Darby (1973: 29) agrees with Hoskins that at the time of the Anglo Saxons the geography of villages was of a similar pattern to today. He writes on the value of studying the Domesday Book* of 1087 and the information it provides on an area's population, land use, resources and industries (Darby 1973: 66). He suggests, as does Hoskins, that the agrarian changes seen in other parts of England from the mid-fifteenth to the mid-seventeenth centuries caused little depopulation, or reduction in building, in mid Devon.

Glassock (1973: 142) discusses the Lay Subsidy, of 1334, which recorded the tax paid on goods, such as crops and stock, and gives an idea of the economic state of the countryside at that date. The study area, in mid Devon, is estimated to have been of average wealth.

Baker (1973: 217) agrees with Hoskins (1954) that many farmsteads, rebuilt in the later Middle Ages, still survive. He describes this as the time when first floors were added to open hall* houses, necessitating the insertion of staircases and the building of chimneys.

* see Glossary

Cottages were built by small farmers, with more substantial buildings erected by yeomen and lesser gentry.

At this period, Devon, according to Emery (1973: 251), had a comparatively high population and an economy based on agriculture and industry, including the manufacture of cloth. Water power from streams in the area around Crediton, which includes the parish of Sandford, was used for the fulling mills* that were essential to the woollen industry.

In *The Making of the English Village*, Roberts (1987) describes how the settlement plans of villages may provide evidence of past occupation and use. He discusses how original settlement layouts may change over time and how age and importance may be judged from surviving evidence, such as old field patterns, roads and archaeological remains (Roberts 1987:18).

Roberts (1987: 166) explains the importance of property boundaries, which may be marked by stones, ditches, banks or hedges. He discusses continuity of settlement, the association between village sites and the surrounding landscape, and the problems of understanding chronological contexts (Roberts 1987: 214). He illustrates site characteristics, such as water supply, drainage, flat land, shelter, aspect and accessibility with a model of a village set on a slope, facing south, between enclosed grazing land and lower arable land (Roberts 1987: 110). Sandford, the main settlement in the study area, has similar characteristics.

In a later publication, *Landscapes of Settlement,* Roberts (1996) continues to expound on the theory that settlements in the landscape are not static but continue to evolve through

* see Glossary

time. He reiterates his belief that to understand rural settlements it is necessary to understand their past.

The arguments of Hoskins, Darby et al. and Roberts support one of the underlying concepts of the present project - that it is necessary to understand evidence contained in the physical surroundings of buildings in order to gain an understanding of their development, use, role and status.

Other specific aspects of the development of the landscape that may be of importance to the siting of buildings, relate to particular elements that indicate historic landuse including field systems, track and road systems and evidence of the management of woodland.

Christopher Taylor's work, *Fields in the English Landscape* (1975), illustrates how an understanding of different types and forms of fields can provide evidence as to earlier regional settlement patterns and former agricultural use. Archaeological evidence such as pottery shards* and other artefacts, association with ancient trackways and enclosures and fields of small, irregular shape may all indicate earlier settlement plans that have influenced the layout of current settlements and farmsteads. He suggests that, as evidence for old hedges disappears, these may have to be identified by aerial or satellite photography (Taylor 1975: 46).

Taylor (1975: 101) mentions the affect of ecclesiastical ownership on agricultural land, important to the current project as certain of the cob farmsteads in the study area are known to have been prebendary* holdings in the ownership of the collegiate church at Crediton.

* see Glossary

The introduction of new crops and farming methods in the eighteenth and nineteenth centuries may have made less of an impact in Devon than elsewhere but evidence from documents and maps of the time indicate that changes did occur. One of these was the development of a water distribution system using channels, or gutters, to feed water downhill over sloping pasture land (Taylor 1975: 134). Remains of such systems have been found in the study area.

In *Roads and Tracks of Britain* (1979), Taylor takes a chronological view in much the same way as when he is describing the development of fields and field boundaries. Taylor's interest in this subject is related to the way roads and tracks have affected the history of the landscape. Roads may affect the position of towns and villages and many of the roads and tracks in use today may have had their origins in the later prehistoric landscape (Taylor 1979: xiii).

Taylor considers, like Hoskins (1954), Darby (1973), and Roberts (1987), that the early Saxon settlement showed dispersed rather than nucleated settlement patterns and that the evidence of the existence of Saxon trackways may be in the names used (Taylor 1979: 93). Taylor's description of the routes in South West England, near to the region of the study area, are of importance. The Roman route from Exeter towards Barnstaple, which travelled via Crediton close to the southern boundary of the study parish, appears to have been superimposed on an earlier pattern of lanes which may indicate a pre-Roman settlement pattern.

As certain existing farmsteads, in Taylor's opinion, still stand on the site they occupied in the late eleventh century, their surrounding fields are likely to be of similar date. From this assumption the suggestion is made that the road systems through the fields and between the farmsteads are also likely to be of eleventh century origin (Taylor 1979: 108). By the post medieval period roads began to be included on county and national maps, including those drawn by Ogilby in 1675 and Dunn in 1765 (facsimiles held in the Devon Record Office).

The turnpike system*, with tolls, was introduced in the mid seventeenth century and Taylor (1979: 159), like Hoskins (1954), explains the affect on the landscape in terms of the construction of coaching inns, toll houses, bridges and milestones. The turnpikes were also instrumental in the creation of new communities, as is likely to have happened at an outlying settlement in the study area, called New Buildings, that is sited on an old turnpike road.

Taylor's work is of importance to the current project as it identifies particular elements in the landscape, including field boundaries and road systems, elements that may help identify early settlement patterns, land use and communications in the study area. These items will need to be included in the proposed inventory database.

Oliver Rackham's work, *The History of the Countryside* (1986), introduces further important elements in the landscape. Rackham (1986: 5) is in agreement with Taylor (1975), Roberts (1996), Hoskins (1955) and Darby (1973), that the study of the history of a landscape can provide a record of the origins and growth of settlements within it. Rackham (1986: 4) defines two different landscapes in lowland England, one he categorises as Ancient Countryside and one as Planned Countryside. The first he considers to have evolved naturally over one thousand years of continual use, the second as created within the recent past. The former landscape shows evidence of previous occupation by the

* see Glossary

existence of small fields, pollarded trees, sunken lanes or holloways and irregular thick hedgerows containing many plant species. The latter is described as containing straight, thin hedges with few different species, large regular sized fields and a scarcity of woods and ponds. The chosen study area conforms to Rackham's criteria for Ancient Countryside.

Rackham (1986: 6-24) clarifies the role of historic woodland in the landscape and explains how evidence of earlier woodland management systems may be gained from pollen analysis, documents and field study. Within the study area woodland is recorded in Domesday Book* (1087) and in an Anglo Saxon Charter (Rose-Troup 1942).

The use of wood by medieval carpenters is described by Rackham (1986: 87) who suggests that large trees were only used for major constructional parts, such as crucks*, the major structural elements in the roofs of older cob buildings.

He adds to the information gained from Taylor (1975), by his discussions of the historical use of hedges as boundaries. He comments on the fact that hedgerows were recorded in Anglo Saxon Charters and that trees and hedgerows may also appear in other sources of documentation, including court rolls and estate records (Rackham 1986: 185-187).

In a similar manner to Hoskins (1954) and Taylor (1975) Rackham describes the chronological development of highways. He suggests that evidence of historic routes can be identified from their geographical position, their use as boundaries or the presence of particular architectural structures or archeological artefacts (Rackham 1986: 250-253).

* see Glossary

The final landscape element of particular interest in this work is the description given of human made ponds and pits, some of which, Rackham (1986: 371) considers, may have been used as sources of clay or subsoil for constructing buildings.

Other authors provide information on the relationship between buildings and landscape from the standpoint of their own particular discipline or interest. As Brunskill (1988: 18) and Johnson (1993: 7) have commented, there are many disciplines that have an interest in the study of vernacular buildings.

Cunliffe (1983: 63) views the effect of human occupation on the landscape from an archaeological viewpoint. He suggests that prehistoric intensive farming of upland areas may have caused erosion. This subsequently led to the development of settlements on more productive land half way down the slope, with water meadow systems being developed in the valley bottoms, where there is an accumulation of alluvial deposits.

This profile is similar to the model described by Roberts (1987: 110). It also relates to the siting of the village at Sandford which lies above the valley floor of the River Creedy, which, as mentioned on page 36, Westcote (1650c) considered particularly fertile (Oliver and Jones 1845: 294).

It leads to the conjecture that the presence of geological materials, such as head, which are found in valley bottoms and from which walling material can be obtained, may have influenced the choice of site. The presence of this material and the general geology of the study area are of particular importance to the current project. Edmonds, McKeown and Williams (1975) describe the geology of the study area. Their work is discussed in Chapter Four.

Other influences on the siting of buildings are described by the Fletchers in A *History of Architecture on the Comparative Method* (1905). In this early publication on the evolution of buildings, the Fletchers make the observation that external factors may have an effect on the location, material and survival of buildings. An elaborate diagram which is reproduced in Figure 3.7 illustrates these influences (Fletcher and Fletcher 1905: 4).

Johnson's approach to studying traditional rural architecture is somewhat different. He is an archaeologist and in his 1993 publication, *Housing Culture, Traditional Architecture in an English Landscape*, Johnson states that he regards the study of buildings as being similar to the study of archaeological artefacts in the landscape, and that factors that have influenced their development have to be discovered not assumed (Johnson 1993: xiii). Morriss agrees with Johnson and also considers that buildings may be studied as archaeological objects (Morriss 2000: 10).

From the work of early topographers, historical geographers, historians, geologists, archaeologists and architects a better understanding has been gained of the way in which settlements are interconnected with the landscape in which they are sited and buildings are related to their surroundings. Of equal importance is the knowledge acquired of the topographical elements that may be of particular value for inclusion in the proposed cob inventory database.

The final section of this literature survey considers the third side of the triangular concept, illustrated in Chapter One (Figure 1.3), the perceived equal value of the relationship between buildings and their historical environment.

Literature relating to historic documentation

Article 7 in the Venice Charter of 1964 emphasises the fact that a historical monument or structure is inseparable from its history (Venice Charter 1964). The study of documents is of considerable importance in understanding this history, an importance that has been acknowledged by authors from differing disciplines.

Brunskill (1988: 224) suggests that when recording vernacular buildings, an examination of documents relating to the buildings, their owners and their occupiers is advisable. Historical documentation may reveal the original use of a building and help in the understanding of its earlier form prior to later additions.

The study of particular types of buildings requires the examination of different forms of documentation. Barley (1986: 120) refers to the use of Bishop's Registers and manorial records in the search for private chapels in manor houses and the use of taxation records to identify monastic farmsteads. An exemption from tax may identify a farm belonging to a religious order (Barley 1986: 131). As has been mentioned earlier, the study area contains both private chapels and farmsteads that were previously in ecclesiastical ownership.

Historic graphic material may be an important source of information. Robinson (1983), in his study of Georgian model farmsteads, uses contemporary architectural plans to explore the parallel development of farm buildings and agricultural innovations in the eighteenth century.

Tithe Maps and Apportionments, usually of the mid nineteenth century, illustrate the use, size and financial status of a landholding at that particular date. These surveys were made following the passing of the Tithe Commutation Act of 1836, when the Tithe Commission was empowered to commute existing tithes paid in kind into tithes paid annually in cash. They provide an important record of a parish at the date of survey. The apportionment lists details of ownership, area and agreed tithe. From this an estimation can be gained of the value and importance of the property at that date (Kain and Prince 1988).

The availability of estate records helps identify and comprehend estate buildings. Wade Martins (1980) and Darley (1975) illustrate this in studies of estate buildings. Examples of estate maps for parts of the study area are illustrated in Figure 4.3[1].

Roberts (1987: 10) demonstrates the idea that settlement development is inseparable from the evidence of documents such as the Domesday Book, William the Conqueror's eleventh century inventory of landownership and use. He stresses the need for using documentary material to corroborate evidence discovered from other sources.

Taylor (1979) discusses the use of documents from which evidence of the existence of roads may be deduced. These include manorial records and the Curia Regis Rolls which contain details of disputes relating to highways. Documentary evidence may also be found on the maintenance and repair of roads.

The potential importance of details included in the Anglo-Saxon charters is referred to by Rackham (1986: 9) who explains how these charters may include details of boundaries and

[1] Enlargements of the photographs are included in Appendix One, Figure 4.3

land management. He also considers that early maps, which were drawn to a large scale, may contain valuable evidence (Rackham 1986: 18).

Hoskins (1972) provides advice on the use of different types of documentary material and suggests various sources of documentation, which are relevant to the study of buildings and their surroundings. In *Local History in England* (1972), Hoskins explains the importance of the use of maps as historical documents, but also comments on the need to reinforce evidence found by undertaking field work. To trace the existence and origins of buildings and their surroundings he suggests the use of written documentary material including parish and county records, land ownership and use records, directories and parliamentary papers (Hoskins 1972: Chapter 3).

Hoskins (1972: 18-26) also refers to distinctive characters in different landscapes and suggests that this variety may be attributable to historical facts relating to landownership - facts that may be confirmed by the study of relevant documents and the work of early topographical writers. Brayshay (1996: 3) also believes that the work of these writers, some of it published and some in manuscript form, is of value in reconstructing past landscapes.

Hooke and Kain (1982: 1) discuss the use of historical material in order to understand the changes that human activities have wrought on the environment. Documents, they advise, provide information as to the chronology of these changes (Hooke and Kain 1982: xviii). They categorise documents into three major types, graphical, written and statistical and suggest that sources of material may be considered as either primary or secondary. Primary sources are original documents or facsimiles of originals and secondary sources are material that refers to, or is commented on, by other authors.

Hooke and Kain (1982: 68) also emphasise the need to evaluate the accuracy of historical sources and suggest that material may need corroborating, either by field evidence or by further documentary evidence.

Primary sources for Devon are extensive. There are records that relate to land, buildings and people, including manorial, estate, legal, ecclesiastical and personal written documents. Examples of this material include the part of the Domesday Book* that refers to Devon, which is dated 1087, the parish records, tax assessments, probate inventories and records relating to turnpike trusts. All of these contain information on ownership, occupancy, type and use of buildings.

The majority of the historical documentary material used in this project was sourced to the Devon County Record Offices in Exeter and Barnstaple and the Archaeology Department of Devon County Council, with additional graphic, written and statistical material referenced to the National Monuments Record, the Public Record Office, and the libraries of the University of Exeter and the University of Plymouth. Other historic material, in private ownership, was loaned for review.

Cartographic material reviewed included historic county maps and the Ordnance Survey maps from the First Series of the early 1800s onwards. Estate maps were discovered relating to the study area, the earliest being a map of 1763 (Devon records office B170/64). A portion of this map is illustrated in Figure 4.3[2].

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* see Glossary

[2] Enlargements of the photographs in Figure 4.3 are included in Appendix One.

Historic documentation that particularly relates to the study area, Sandford, will be discussed in Chapter 4 and a full list of all documentary material examined will be found in Appendix Two.

Conclusions

The literature presented in this survey are but an indication of the substantial amount of historic and current literature available on the topics of earthen buildings, landscape development and historic documentation. The focus has been investigative rather than critical with a twofold motive underlying the choice of literature: to gain knowledge of the differing topics and to clarify items of particular importance for inclusion in the proposed cob building inventory database.

The literature on earthen buildings, from a global and European perspective, has been concentrated on references to the historic use of earth as a building material, the spatial distribution of earthen buildings and the differing constructional techniques employed.

The literature relating to the history of the landscape, and particular elements within it, supports the argument that an awareness of surrounding landscape features may help identify the chronology and enhance the understanding of a settlement and the individual buildings within it. Arguments that exist regarding differing theories of landscape history or development are not considered relevant to this thesis. The fact that Johnson (1993: 9) considers Hoskins' approach to be based on economic principles and Muir (1998: 74) contends that Hoskins' rejection of change has influenced his approach, is of interest but not of value for the purposes of this project.

The literature relating to the study and sourcing of documentary evidence demonstrates that such documentation may help in the comprehension of the historic context of buildings. The same argument as has been made regarding the approach taken to the review of work on landscape history can be made in relation to comments made on the study and sourcing of documentary evidence. The perceived importance of sources of evidence in relation to other sources is of less importance than discovering the differing types of evidence that may be available and of use.

However, a consensus was found in the literature as to the need to develop strategies for conserving and understanding surviving historic earthen buildings. The importance of considering either the geographical situation of buildings or the historic context has been considered by certain of the authors including Alcock and Hulland (1972), Conti et al. (1999) and Johnson (1993). Little evidence was found, though, of work that supports the proposed triangular concept of linking knowledge of the architectural elements of buildings to both their topographical and historic contexts.

In the next chapter, methods for recording buildings are critically reviewed in order to consider whether or not these contexts are considered and to establish a methodology appropriate for this work.

CHAPTER THREE - RECORDING METHODOLOGIES

Introduction

The previous chapter demonstrated the quantity and diversity of available literature relating to earthen buildings, landscape, topography and historic documentation. It also demonstrated that, in the reviewed literature on landscape, observations were made on the relationships between buildings, settlement patterns and topography. However, in literature on earthen buildings, less importance was attributed to relationships between the buildings and geographical and historic contexts. In the case of cob buildings these relationships may be of particular importance.

Cob buildings have historically tended to be considered of lower status than those built from stone (Child 1994: 7). There is evidence to show that cob buildings have been refaced, had sections of the cob walls replaced by other materials, or been altered in such a way that their origins are disguised. As a result, there are a number of cob buildings that survive undetected and unrecorded. This leads to the need to question whether existing recording methodologies allow for these limitations and make provision for the inclusion of extrinsic factors, such as geographic and historic contexts, that could assist in the identification of unrecognised cob buildings that might be of significance.

The use of the terms recording and recording methodology need to be explained as they may be construed in different ways. They may refer to a systematic procedure for studying particular examples or types of architecture (Brunskill 1988), or to extensive work undertaken to assess a class of buildings (Cox 1996), or they may be associated with a pre-emptive act, such as recording buildings prior to conservation or alteration (Lettelier 1994a).

Recording may also, as in the case of the Royal Commission on the Historical Monuments of England, (RCHME) (now a part of English Heritage) be considered to be a way to illustrate and describe a building while also demonstrating the historical significance (RCHME 1996).

To avoid confusion, the words record, survey, recording methodology and inventory, as used in this project, are defined as follows:

- A record indicates a description or account of an individual property, structure or site at a particular point in time. The record may include a variety of factors or variables and may be in written, graphical or cartographical form.

- A survey, in the context of this study, is taken to be the detailed investigation and recording of an individual building or site which includes drawings and measurements.

- A recording methodology refers to the way in which the data has been selected, located and collected and to the method used to collate, organise and store information for assessment, reference and analysis.

- An inventory relates to a collection or list of records of individual properties or sites.

This chapter explores a selection of different methodologies used for recording buildings. The methodologies discussed are introduced in the order established in the previous chapter: namely, in terms of their global, European and national use.

The global and European methodologies reviewed include those designed for recording earthen structures. The methodologies selected for review, that are used in the United

Kingdom, are examples of those considered pertinent to vernacular buildings or to the recording of archaeological sites and structures. These include English Heritage's system for describing buildings given Listed* building status, the current statutory mechanism for protecting buildings in England (English Heritage 1992a) and the methodology devised for the review of Listed* Buildings at Risk (English Heritage 1992b). Also included is the RCHME methodology (RCHME 1996).

At the conclusion of this chapter English Heritage's recently introduced computerised recording systems are referred to, and the concept of using a Geographical Information System for the development of a recording methodology for buildings is introduced (Foard 1996: 1-4).

A systematic search has been undertaken of recording methodologies from different parts of the world. With the exception of historic methodologies or those used for national inventories, the principle underlying the choice of examples described here has been the relevance of the methodology to vernacular buildings. The majority of the methodologies selected have either been discussed with their originators or the author has had the opportunity to use them in practice.

Recording methodologies worldwide

The importance of comprehending and recording the history and setting of a monument or site in order to ascertain the cultural significance, is stressed in the International Council of Monuments and Sites (ICOMOS) publication on conservation education and training (Fielden 1999: 8).

* see Glossary

The creation of inventories, specifically for earthen buildings, was a recommendation of the 1983 International Symposium and Training Workshop on the Conservation of Adobe, held in Lima, Peru. This recommendation was repeated at following international conferences in Rome in 1987 and in Silves, Portugal in 1993. At the latter conference the evaluation of traditional techniques and materials used in the construction of earthen buildings was also recommended. (Reports on the proceedings of these meetings are available from ICCROM, Rome).

Lettelier (1994a) stresses the importance of the inventories and evaluations in his management guidelines for recording and documenting information on World Heritage Sites (Lettelier 1994a). The guidelines demonstrate a logical and relevant system that encompasses paper based and computer based methods of data storage.

Summary of Lettelier's methodology

Lettelier (1994a: 2) states that knowledge and understanding is needed not only of the intrinsic significance of sites but also of extrinsic factors that may affect them. Extrinsic factors include the external environment, which includes economic as well as physical factors. He considers that the conservation process relies on a multi-disciplinary approach that should involve architects, archaeologists and historians.

In the context of conservation research projects, the need to record is referred to as being critical. Lettelier (1994a: 3) defines recording as the capturing of information that describes the physical state of a site at a particular point in time.

This definition fits well with the context of the current project, as does Lettelier's assertion that all documentation used in recording must be from reliable sources (Lettelier 1994a: 4).

The purpose of the guidelines is to demonstrate methods by which precise and accurate records of historic resources may be produced for reasons of conservation, maintenance or posterity.

The methodology outlined describes four stages:

- Defining the specific needs and purposes of the project.
- Locating and selecting relevant data.
- Analysing the data.
- Storing the data in an accessible manner for use during conservation work and for later research and reference.

Within these stages Lettelier (1994b) suggests that three different levels of recording may be undertaken. These include a reconaissance level which results in a photographic report, a general physical condition description and initial sketches, a preliminary level where initial photographic records are increased and measured drawings are made of a building or historic site and a detailed level that involves rectified photography, written descriptions and measured drawings.

The methodology is founded on single site conservation projects and is primarily designed to describe buildings from a structural and condition point of view. It is a comprehensive and adaptable prototype methodology that describes desk based and site based data collection methods and paper based and computer based storage systems. Figures 3.1a and 3.1b show diagrams by Lettelier that allow the comparison of traditional written techniques with digital techniques for undertaking the different levels of recording suggested (Lettelier 1994b, pages 3-4).

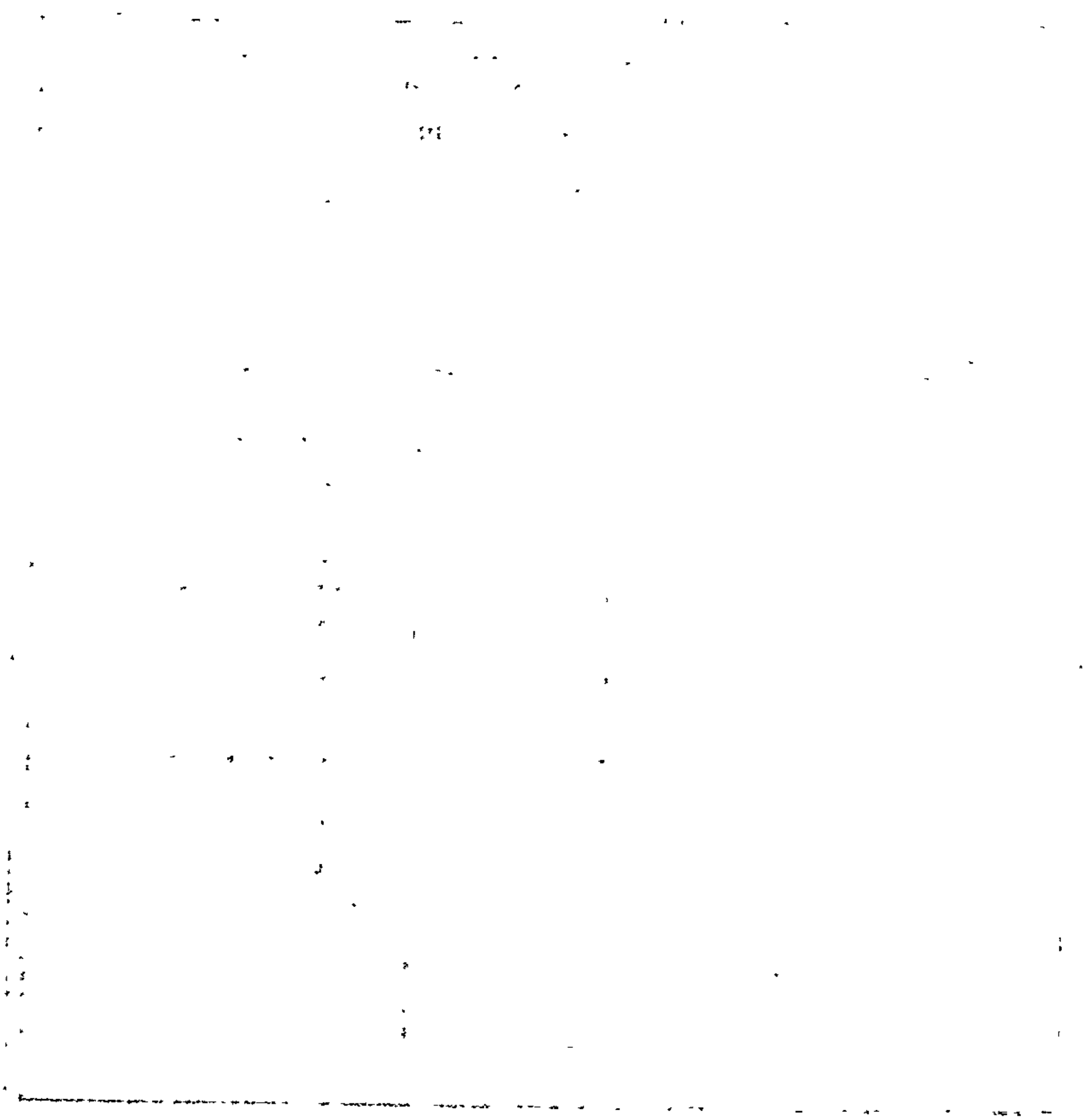
Traditional Heritage Recording Tools and Techniques

"MATRIX GUIDELINE"

for Cultural Heritage

Characteristics / Levels of recording	A Reconnaissance Record	B Preliminary Record	C Detailed Record	
Purpose of recording	reconnaissance initial inventory initial planning reference data	planning initial condition investigation stabilization pre-design reference data	"as-found" condition design construction "as-built" record maintenance/monitoring posterity	
Recording Tools	35 mm photography sketches	hand recording, large format photography 35 mm rectified photography 35 mm amateur camera stereo-photogrammetry	hand recording large format rectif.-photography stereo photogrammetry	
Accuracy of drawings	not to scale	plans and elevations ± 5.0 in. (±10cm) details ± 0.5 in. (±1cm)	plans and elevations = ± 0.5 in. (±1cm) details ± 0.1 in. (±2mm)	
Results	photographic report photo keyplan initial condition/description sketches	measured drawings asset description/condition observations photographic report	measured drawings asset description/condition observations photographic report	
Cost	Low (a few days on site by recording team)	Moderate (several weeks or more on site by recording team)	Moderate to High (extensive and possibly on going activity on site by recording team)	will vary in absolute terms with scale and complexity of site

Figure 3.1a Lettelier's figure showing traditional recording techniques



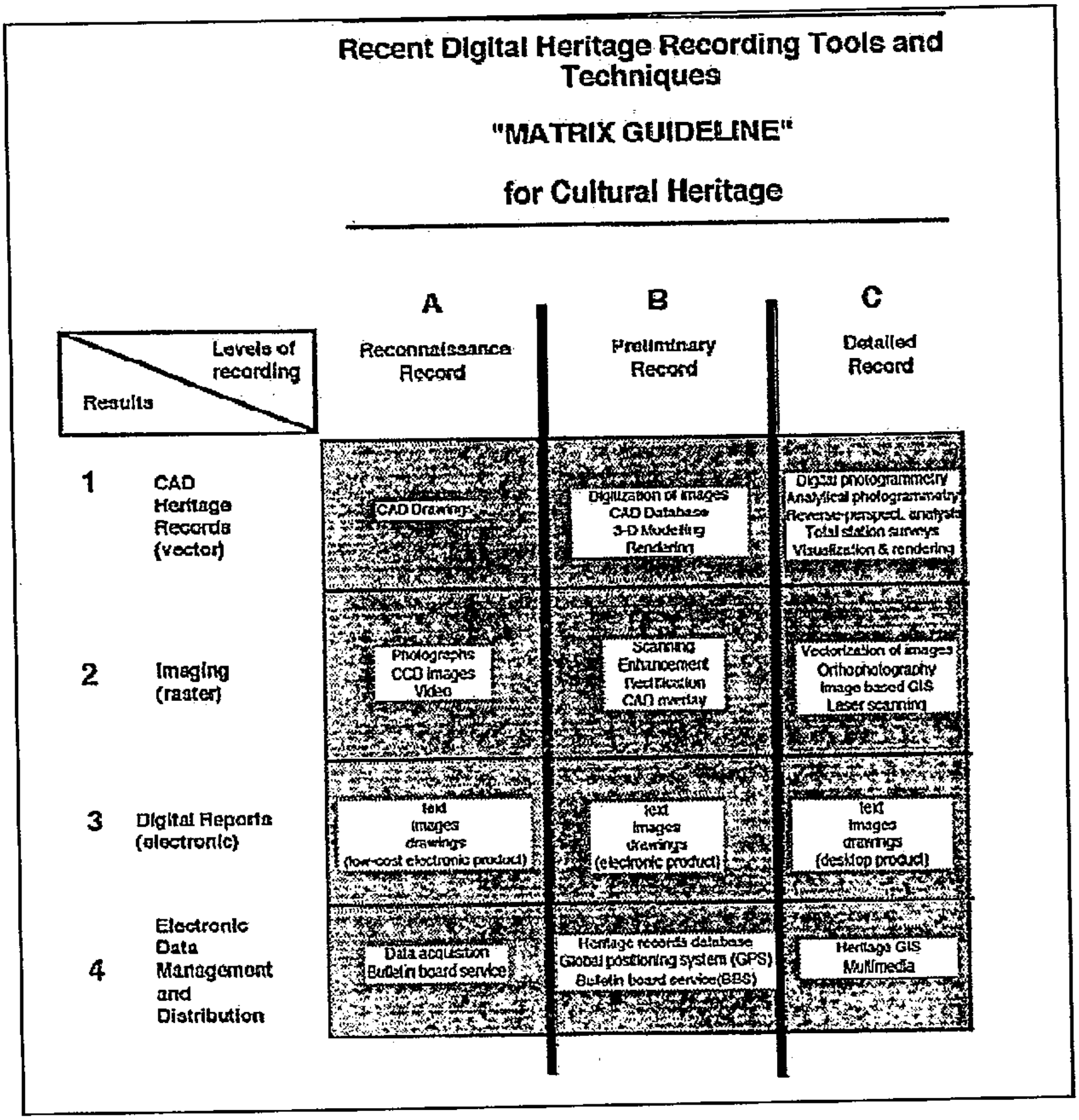


Figure 3.1b Lettelier's figure showing digital recording techniques

The methodology could be adapted for use in larger, regionally based recording projects but only allows for limited inclusion of geographical or historic factors. Lectures and demonstrations, by Lettelier, on the use of the methodology were attended by the author and experience gained in using the different recording techniques described.

Other recording methodologies demonstrate a more traditional approach using written records only. An example is the inventory methodology used in Portugal for nationally important buildings.

Summary of methodology used by the Direcção Geral dos Edifícios e Monumentos Nacionais in Portugal

The aim of the method is to produce a catalogue of buildings considered to be of national importance. The method, described by Alçada (1994), involves listing items of information about selected buildings. These include:

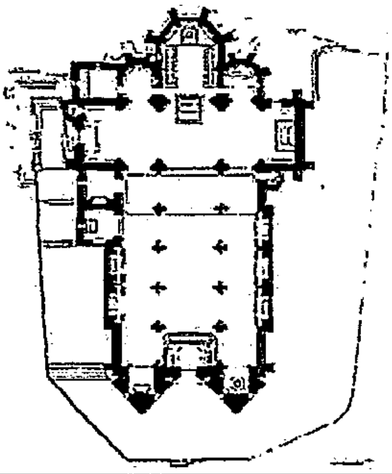
- The location of the building.
- The date of designation.
- The situation of the building, whether urban or rural, solitary or within a group.
- A written description of the main architectural features.
- The original and the current use of the building.
- An indication of the historic context.

Floor plans and photographs are included and the records are stored in a paper based system. An entry from the monument catalogue is shown in Figure 3.2. This approach illustrates the type of inventory system commonly used prior to the availability of computer technology. It is both desk and site based and designed to provide a comprehensive catalogue of architecturally important buildings. It does not allow for the inclusion of any geographical or historic factors that may influence the buildings.

DIRECÇÃO GERAL DOS EDIFÍCIOS E MONUMENTOS NACIONAIS

MONUMENTO

Nº DE INVENTÁRIO - 090742002
CÓDIGO TIPOLÓGICO 1.O.b



DESIGNAÇÃO -Sé da Guarda

LOCALIZAÇÃO -Guarda, Guarda, Sé

ACESSO -Pr. Luís de Camões

PROTECÇÃO -MN, Dec. 16-06-1910, DG 136 de 23 Junho 1910, ZP, DG 154 de 03 Julho 1953; Dec. 10-01-1907, de 17 Janeiro 1907 GRAU -1

AMBIENTE -Urbano, isolado; situado no centro histórico, intra-muralhas, a meia encosta, em espaço principal, estruturador da cidade; fronteiro ao alçado dos "balcões" (edifícios com arcada); adro murado circundando três alçados e acesso através de escadaria de ângulo.

DESCRIÇÃO -Planta composta em cruz latina, 3 naves, transepto saliente, cabeceira tripartida de planta poligonal; cobertura diferenciada em terraço e a 4 águas. Frontespício orientado; 2 torres, pórtico encimado por 2 frestas e óculo. Alçado N.: 5 panos nas naves; transepto, absídiola e abside, contrafortes e arcobotantes; 3 capelas adossadas no 1º registo e clerestório no 2º; transepto: pórtico em arco quebrado e janelão em arco trilobado. Alçado E.: 2 panos nos braços do transepto e 3 panos na abside e absídiolas; contrafortes; braço S. do transepto: pórtico em arco quebrado, absídiolas: 3 frestas em arco pleno, abside: 3 frestas em arco quebrado. Alçado S.: 5 panos nas naves; transepto, absídiola e abside, contrafortes e arcobotantes, três capelas adossadas no 1º registo e clerestório no 2º, transepto: janelão em arco trilobado. Interior: espaço diferenciado; nave central: clerestório, 5 tramos, 2 andares, 1ª arcada longitudinal em arco pleno; 2º arcos formeiros de volta inteira e arcos torais quebrados, colunas embebidas, pilares cruciformes com colunas adossadas; abóbada de cruzaria de ogivas. Naves laterais. cegas; 5 tramos; 1 andar; abóbada de cruzaria de ogivas. Cruzeiro: 4 óculos, pilares cruciformes e fasciculados com colunas torsas adossadas; abóboda estrelada. Transepto: 2 janelões nos topos; 2 andares, 4 tramos, piso intermédio: trifório interrompido no alçado E. do braço S. e N.. Abside: 3 frestas; 2 andares; 2 tramos, 3 arcadas cegas em arco quebrado; retábulo escultórico no altar-mor, arcos torais quebrados; abóboda de cruzaria de ogivas com cadeia longitudinal e rematada em 5 panos. Absídiolas. 3 frestas; 1 andar, 1 tramo, arcos torais quebrados, colunas embebidas; abóboda de cruzaria de ogivas rematada em 5 panos. Corpos secundários: Capela dos Pinasc Capela dos Ferros, nave lateral N.; cinco capelas laterais no alçado N. e S., sacristia adossada à absídiola N., baptistério e capela sob as torres.

UTILIZAÇÃO INICIAL -Religiosa

UTILIZAÇÃO ACTUAL -Religiosa, turística

PROPRIEDADE -Estado

AFECTAÇÃO -IPPAR

ÉPOCA DE CONSTRUÇÃO -Séc. XIV / XVI (documentada)

ARQUITECTO CONSTRUTOR -Irmãos Pedro e Filipe Henriques (documentado)

Figure 3.2 Example of Recording Methodology. Portugese National Monument Record

A similar example of the use of a paper based recording methodology to create an inventory of historic buildings is demonstrated by Bowman (1995).

Summary of Bowman's methodology

The aim of the inventory is to record buildings in New Zealand's capital city, Wellington, which are considered to be of historic significance and to assess and compare their heritage value.

The method employed involves listing particular items relating to the selected buildings:

- The location of the building.
- The date of construction and the architect, if known.
- The type and use of the building.
- The condition of the building.
- Any existing records of the history of the building.
- The heritage value of the building in respect of cultural, emotional, historic, design and use factors.
- A statement of the significance of the building.

The individual written records are collated into volumes and stored in a paper based system. Figure 3.3 shows Government House in Wellington, one of the buildings included in the inventory (Bowman 1995, Vol.2 pages 11-12).

Similarly to the Portugese methodology described above, this is also a desk and site based method of recording buildings. The written records give details of the architecture and history of the buildings, define the historic significance and also summarise the considered heritage value. The methodology is not designed to incorporate any geographical or topographical information

GOVERNMENT HOUSE
Dufferin Street

Architect: John Campbell

Architectural Style:

Compilation Date: February 1994

Condition: Good

Visible Material:

Date of Construction: 1910

Building Type/Use: Governor Generals Residence.

Photo Negative: 325, 16/2/92

District Plan: Map 16, reference 103

❑ HISTORY

The present Government House is the third such building in Wellington. The first Government House, built for Colonel William Wakefield, was on a site overlooking Lambton Quay. The next building was described as a "stately wooden building, somewhat in the Italianate style". In 1907 the old Parliament Buildings were burnt down and Government House was commandeered. The third Government House was then built away from the government centre on the site of the former Mount View Asylum.

Designed by John Campbell, this large two storeyed house was built in 1910. The formal entrance to the house is a classical styled porte-cochere with Oamaru stone columns. The remainder of the house is of timber construction with an English tile roof. The lower storey is clad with weatherboards and the upper floor is finished with rough cast plaster. The house today is residence of the Governor General and is used for many formal and state functions.

❑ HISTORIC SIGNIFICANCE

An important building due to its long-term association with consecutive Governor Generals of New Zealand. It is the third such building in Wellington, and is a grand house with a formal and elegant interior and exterior.

❑ ARCHITECT

John Campbell served his article under John Gordon (c1835-1912), in Glasgow. He arrived in Dunedin in 1882 and, after a brief period as a draughtsman with Mason and Wales, joined the Dunedin branch of the Public Works Department in 1883. His first known work, an unbuilt design for the Dunedin Railway Station, reveals an early interest in Baroque architecture.

In November 1888 Campbell was transferred to Wellington where in 1889 he took up the position of draughtsman in charge of the Public Buildings Division of the Public Works Department.

He remained in charge of the design of government buildings throughout New Zealand until his retirement in 1922, becoming in 1909 the first person to hold the position of Government Architect. Government architecture designed under his aegis evidences a change in style from Queen Anne to Edwardian Baroque. His best known Queen Anne design is the Dunedin Police Station (1895-6), modelled on Richard Norman Shaw's New Scotland Yard (1887-90). Arguably his best Edwardian Baroque building is the Public Trust Office, Wellington (1905-9). Although Campbell designed the Dunedin Law Courts (1899-1902) in the Gothic style with Scottish Baronial inflection, he established Edwardian Baroque as the government style for police stations, courthouses and post offices throughout New Zealand by 1903. In 1911 Campbell won the nation-wide architectural competition for the design of Parliament Buildings, Wellington. Although only partially completed, Parliament House is the crowning achievement of Campbell's career.

❑ ARCHITECTURE

This two-storeyed house has Tudor and Classical influences, but is Italianate in essence. It is crowned by a flag tower and the building is surrounded by large gardens which cover a mere 24-acres, less than a quarter of the space patients enjoyed when it was previously the Mount View Mental Hospital, which was demolished in 1910 to make way for this building. Inside, the main foyer is lined with crests carved in oak. The drawing room is alive with reflected light. The room is shaped in an L around a conservatory of deep greenery. The walls and elaborate wedding-cake ceiling are white to emphasise the light. Most of the house is ornate and lavish; heavy cornices, mouldings and projecting brackets are a common feature.

❑ SUMMARY OF HERITAGE VALUES

Cultural: Historical and political.
Emotional:
Historical: Associated with successive New Zealand Governor Generals who have resided here over their terms.
Design: A lavish, but eclectic mix of detailing to a design by John Campbell, the Government Architect for a number of years.
Use: Maintains functional use values.
Contextual:
Level of Authenticity: Retains a high level of authenticity in materials, craftsmanship, design and setting.
Statement of Significance: Government House is an important New Zealand building if only for its association with successive Governor Generals who have resided here during their terms in power. The house is a lavish Italianate design by Government architect John Campbell.

SOURCES:

Cityscapes, David McGill, Grant Tilly, 1979.
NZHPT Field Record Form.

Figure 3.3 Recording methodology used for City of Wellington, New Zealand.

Bowman has used a similar methodology to create inventories of the earthen buildings of the nineteenth century settlers in South Island, New Zealand. These buildings demonstrate many similarities to earthen building techniques used in the United Kingdom and Europe, which is not surprising considering the origins of the pioneer settlers (Bowman 2000).

A selection of the buildings included in the inventory were visited by the author in 1996. These included cob cottages constructed by early settlers in rural areas as well as architect designed town houses reminiscent of mid-nineteenth century estate buildings in the south-west of England. The methodology used for recording both the buildings in Wellington and those in South Island has been discussed with Bowman (1996). Figure 3.4 shows photographs, taken by the author, of two nineteenth century earthen buildings from South Island, New Zealand.

Three European methodologies that have also been developed specifically for the recording of earthen buildings are described below. These include one used in the Région Rhône-Alpes, France, one in the Abruzzo region of Italy and one in the Czech Republic.

Summary of the Région Rhône-Alpes Methodology

The objective underlying the development of this methodology was the perceived need to improve local knowledge and awareness of the vernacular architectural traditions of the Région and to gain better understanding of earthen building techniques (Guillaud 1987: 4). Knowledge of these techniques was required for the purpose of repairing existing structures and for the construction of new earthen buildings.

The methodology involves listing items relating to the buildings including:

- The location and orientation of the buildings.
- The elevations of the buildings.
- The height, width and condition of the earthen walls.
- Architectural details of the wall and roof structures.

Photographs, floor plans, and maps of the surrounding area are included. The records are paper based and the completed individual numbered inventories are stored according to the village in which the buildings are located. An example is shown in Figure 3.5 (Guillaud 1987: 90).

The methodology employed is primarily site based with measured drawings of general and specific items considered of importance in relation to the typology and survival of the earthen buildings. Drawings, not shown in Figure 3.5, emphasise the relationship between the roof structure and the earthen walling material.

Limited information is given as to past or present use of the building but, from the perspective of the current project, it is of interest for the inclusion of topographical data, although less importance is attached to the historical background.

The Région Rhônes-Alpes, where this methodology has been applied, was visited by the author and the recording methodology discussed with Guillaud, the architect involved with the inception and development of the project (Guillaud 1996).

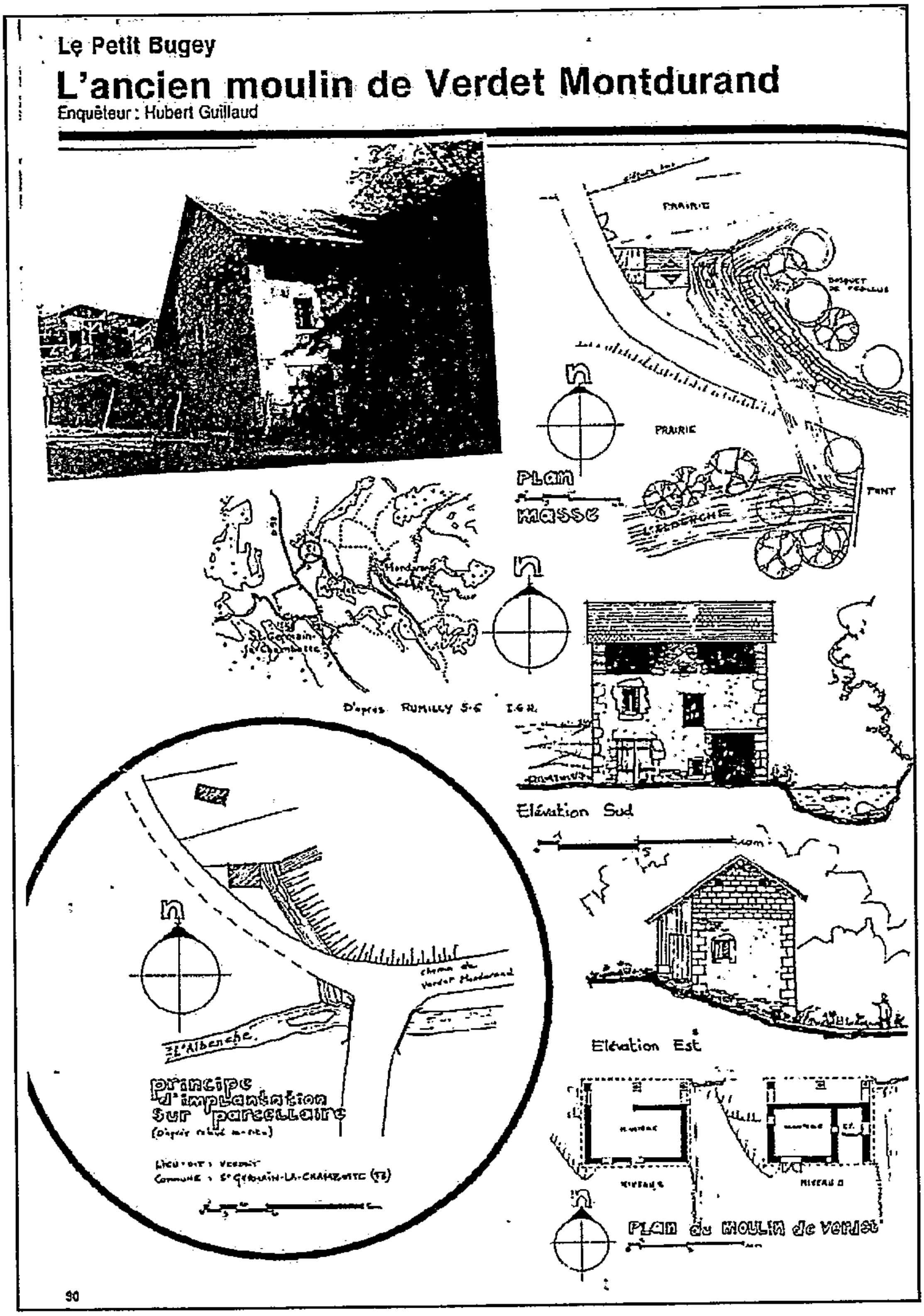


Figure 3.5 An example of an earthen building from the Région Rhônes-Alpes inventory

In the Province of Chieti, in the Abruzzo region of Italy, a recent inventory of earthen buildings has been undertaken. The region, on the Adriatic seaboard, contains a considerable number of traditional clay and straw houses which are built using techniques thought to have been imported from the Balkan countries (Gentile 1999).

Summary of the Province of Chieti Recording Methodology

The methodology is described by Conti et al. (1999) as being a census of earthen architecture. The underlying goals of the project were twofold: the recognition of the uniqueness of the earthen houses and the research, repair and re-use of the buildings (Conti et al. 1999: 16).

A series of records of individual buildings was created. Figure 3.6 shows an example of one of the earthen buildings included (Conti et al. 1999: 48). Symbols were used to identify key features relating to the buildings including:

- A unique identification number.
- The location of the building by administrative zone.
- The typology of the building.
- The earthen construction technique used.

A photograph of each building and a brief written description indicating architectural details and condition are included in each record. The recording methodology utilises a geographical information system (GIS) with a cartographic base at a scale of 1:25,000. This shows topographical and geographical features including contours, river and road systems and settlements. The sites of the earthen buildings are identified and the graphic and written information about the individual structures is accessible via an associated database. Little information is included regarding the historic background of the buildings.

The methodology is both desk and site based with the emphasis on the former. The use of a GIS for the storage of the data is of particular interest. This comprehensive methodology is flexible and includes elements that equate with the current study of cob buildings in mid Devon.

The area and the subject buildings were visited by the author on two occasions and the use of the methodology discussed with one of the architects working on the project (Gentile 1997 and 1999).

A further example of a systematic recording methodology that utilises a Geographical Information System (GIS) for the analysis of the collected data has been demonstrated by a group of architects from Moravia in the Czech Republic (Syrová et al. 2000).

Summary of Moravian Recording Methodology

The area chosen for study is a national park, the Dyje Valley. The recording was undertaken in order to create an inventory of the cob buildings in the valley and to better understand the distribution of the various construction methods used.

The methodology developed incorporates information relating to the surrounding topography although the main emphasis is on understanding and categorising the building materials and construction techniques.

The items considered of particular importance include:

- The location of the buildings.
- The construction materials used.
- The construction techniques used.
- Evidence of opus spicatum (rolls of cob material) for insulation.

A geographical information system was used for the storage, collation, analysis and presentation of the data.

This recording methodology, like the one used in the Italian Province of Chieti, is both desk and site based and uses a GIS for demonstrating the location of the earthen buildings. It also provides information as to the geological and topographical surroundings of the selected buildings (Syrová et al. 2000: 432).

An earlier project by the same group of architects gave detailed descriptions of previous inventories of earthen buildings in rural areas of the same region. These inventories used a similar recording technique but a paper based system was used for the storage of the gathered information (Syrová et al. 1995). Both of the methodologies described have been discussed with one of the architects concerned with the projects (Syrová 2000).

The above review of a selection of global and European methodologies demonstrates the contrasting ways in which inventories of historic buildings are constructed. A comparison of the various items relating to the buildings, considered important to record, is demonstrated in Table 3.1a.

Recording methodologies within the United Kingdom

Similar contrasts in methods of recording are seen within the United Kingdom. A selection of these are illustrated in Table 3.1b. From these tables it will be seen that seven of the recording methodologies selected are dependent on paper based storage systems and three utilise computer based systems.

RECORDED ITEMS	LETTELIER	PORTUGESE	BOWMAN	RHÔNE-ALPES	CHIETI	PROPOSED
Identification Items	Yes	Yes	Yes	Yes	Yes	Yes
Primary Reference No	Yes	Yes	Yes	Yes	Yes	Yes
Property address	Yes	Yes	Yes	Yes	Yes	Yes
Postal Code					Yes	Yes
Map Reference			Yes		Yes	Yes
Descriptive Items	Yes	Yes	Yes	Yes	Yes	Yes
Type	Yes	Yes	Yes	Yes	Yes	Yes
Use	Yes	Yes	Yes	Yes		Yes
Plan	Yes	Yes	Yes	Yes	Yes	Yes
Construction	Yes	Yes	Yes	Yes	Yes	Yes
Architectural Detail	Yes	Yes	Yes	Yes	Yes	Yes
Orientation			Yes	Yes		Yes
Condition	Yes		Yes	Yes	Yes	
Historic Context	Yes	Yes	Yes			Yes
Original Type		Yes	Yes			Yes
Original Use		Yes	Yes			Yes
Ownership		Yes	Yes			Yes
Original Date		Yes	Yes			Yes
Archival references			Yes			Yes
Bibliographic refs		Yes	Yes			Yes
Spatial References	Yes			Yes	Yes	Yes
Geology						Yes
Topography				Yes	Yes	Yes
Water systems						Yes
Road systems						Yes
Boundaries						Yes
System used						Yes
Computerised system	Yes				Yes	Yes
GIS	Yes				Yes	Yes
Descriptive analyses					Yes	Yes
Spatial analyses					Yes	Yes
Site specific	Yes					
Graphic Record	Yes	Yes		Yes	Yes	Yes
Measured drawings	Yes			Yes		
Photographs	Yes	Yes	Yes	Yes	Yes	Yes
Floor plans	Yes	Yes		Yes		
Maps				Yes	Yes	Yes

Table 3.1a

Comparison of Global Recording Methodologies and the Proposed Methodology

RECORDED ITEMS	BRUNSKILL	NAT.TRUST	ALCOCK	HULLAND	KEYSTONE	ENG. HERITAGE	ENP	RCHME	MONARCH	MIDAS	PROPOSED
Identification Items	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Primary Reference No	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Property address	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Postal Code						Yes	Yes	Yes	Yes		Yes
Map Reference	Yes		Yes	Yes		Yes	Yes	Yes	Yes		Yes
Descriptive Items	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Type	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes
Use		Yes	Yes		Yes	Yes	Yes	Yes			Yes
Plan	Yes	Yes	Yes	Yes	Yes	Yes		Yes			Yes
Construction	Yes	Yes	Yes	Yes	Yes	Yes		Yes			Yes
Architectural Detail	Yes	Yes	Yes	Yes	Yes	Yes		Yes			Yes
Orientation	Yes							Yes			Yes
Condition		Yes			Yes		Yes				
Historic Context		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Original Type					Yes		Yes	Yes			Yes
Original Use					Yes		Yes	Yes			Yes
Ownership		Yes				Yes		Yes			Yes
Original Date	Yes	Yes	Yes	Yes	Yes	Yes		Yes			Yes
Archival references		Yes				Yes			Yes		Yes
Bibliographic refs		Yes	Yes	Yes		Yes		Yes			Yes
Spatial References									Yes		Yes
Geology				Yes							Yes
Topography				Yes					Yes		Yes
Water systems				Yes					Yes		Yes
Road systems									Yes		Yes
Boundaries								Yes	Yes		Yes
System used											Yes
Computerised system					Yes		Yes				Yes
GIS									Yes		Yes
Descriptive analyses					Yes		Yes				Yes
Spatial analyses									Yes		Yes
Site specific											
Graphic Record		Yes	Yes		Yes		Yes	Yes			Yes
Measured drawings					Yes			Yes	Yes		
Photographs	Yes	Yes					Yes	Yes	Yes		Yes
Floor plans			Yes					Yes			
Maps								Yes	Yes		Yes

Table 3.1b

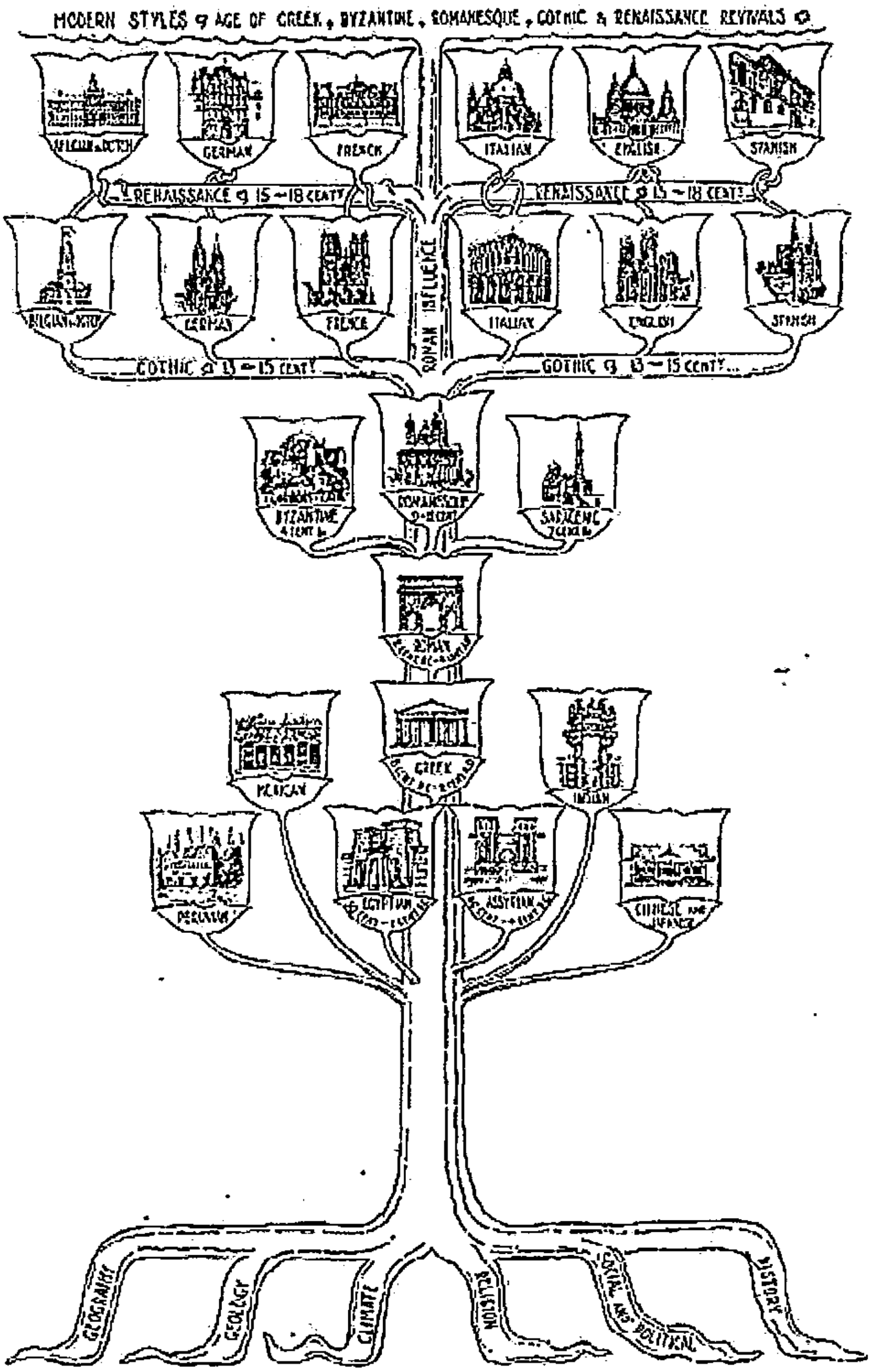
Comparison of Recording Methodologies in the United Kingdom and the Proposed Methodology

An early example of identifying and categorising a comprehensive range of buildings was devised by Fletcher and Fletcher (1905). This is described in their work entitled *The History of Architecture* (1905), in which the Fletchers explore possible relationships between seminal buildings and their surroundings and history.

The Fletchers suggest that geographical, geological and climatic influences may have an effect on the structural style, location, material and survival of a building while religious, socio-political and historic influences may have a cultural bearing on factors such as form and plan. The frontspiece of the 1905 edition illustrates their theories on the evolution of architectural style. This is reproduced in Figure 3.7 (Fletcher and Fletcher 1905: 4).

Although the Fletchers work may not be categorised as a true recording methodology, Cox considers it sets a standard for methodologies that encompass the buildings of more than one culture (Cox 1996: 121). Likewise, Cox considers that Pevsner's series on *The Buildings of England* (Pevsner 1952), may also be considered as a recording methodology. According to Cox this comprehensive county based catalogue of buildings, considered by Pevesner to be of importance, has remained a reference point since its first publication (Cox 1996: 121).

The growth in interest in vernacular architecture in the United Kingdom in the post second world war period and the perceived need to study and record surviving buildings is commented on by Brunskill (1988: 18).



THE TREE OF ARCHITECTURE,

Showing the main growth or evolution of the various styles.

The Tree must be taken as suggestive only, for minor influences cannot be indicated in a diagram of this kind.

Figure 3.7 Showing the Fletchers Tree of Architecture

Summary of Brunskill's Recording Methodology

Brunskill describes his recording methodology as systematic and suitable for the study of minor examples of domestic architecture (Brunskill 1988: 214).

The aim of Brunskill's methodology is to demonstrate a method for studying and analysing a particular building type in a defined geographical area. The methodology suggests listing particular constructional and architectural features.

The items suggested include:

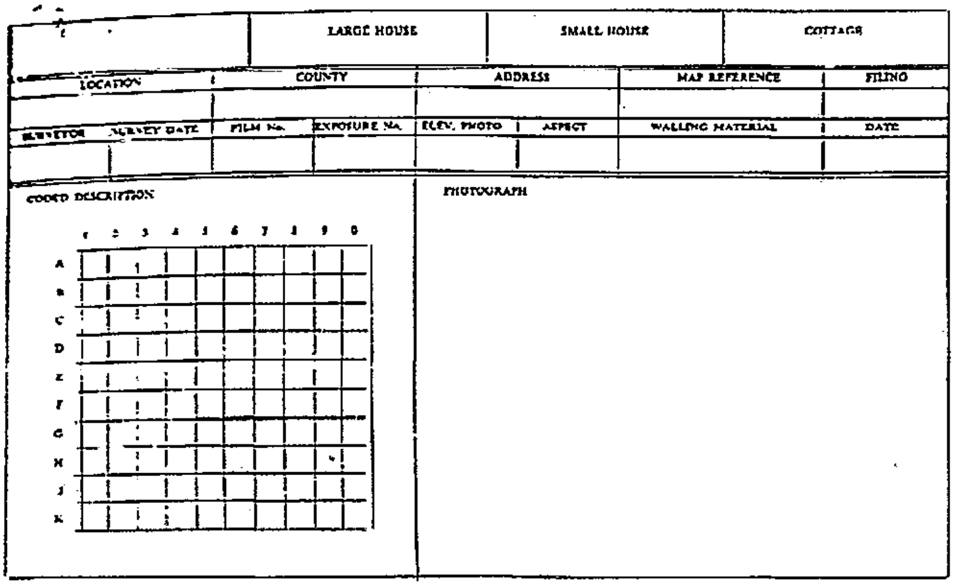
- Constructional techniques and the type of material used for walls.
- The roof shape, structure and covering material.
- The plan and sectional form of the building.
- The architectural and decorative features.

The methodology uses a recording card, or form, which allows for the constructional and architectural features to be individually identified and noted. This is illustrated in Figure 3.8 (Brunskill 1988: 197).

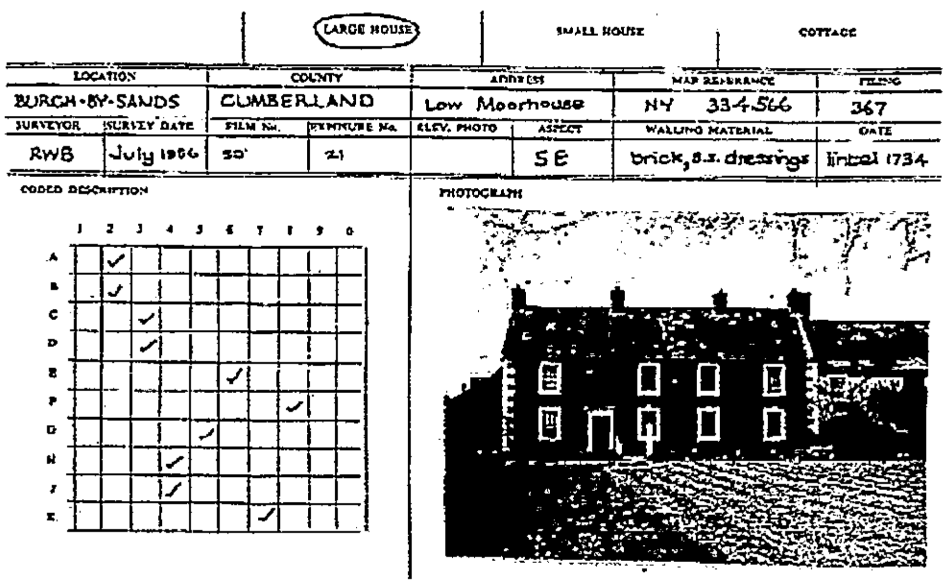
Three levels of study are suggested:

- Extensive coverage of examples in a given area.
- Intensive analysis of selected buildings from the same area.
- Documentary searches relevant to the selected buildings.

Information is stored in paper based records that identify similar details for each building. In this way an extensive survey of the vernacular buildings in an area can be compiled with relative ease and an intensive survey can be undertaken from the completed cards at a later date. Brunskill recommended that this initial recording methodology be supplemented by



A record card made from an 8 in. by 5 in. filing card.



A completed record card. The coded description shows the house to have brick walling (A2), with a mixture of other materials (B2), a gabled roof (C3), of thick slate (D3), to have tall windows (E6), with vertically sliding sashes (F8), a doorway with a renaissance type surround (G5), be two-storey (H4), to have the two unit and cross-passage plan (J4) and to have a barn attached, laithe-house fashion (K7).

Figure 3.8 Showing the record card devised by Brunskill measured drawings. Brunskill's suggested methodology is desk and site based. It is designed as a prototype methodology for the general study and recording of vernacular architecture. The methodology allows for limited analysis to be undertaken but is not designed to include extrinsic influences, such as topographical or geological factors.

Examples of other methodologies, contemporary with that of Brunskill, include those by Alcock (1972) and Hulland (1980). These were also designed to meet the perceived need to record surviving regional vernacular buildings.

Summary of Alcock's and Hulland's Recording Methodologies

Alcock's recording methodology was designed to be used by field workers in order to undertake a rapid review of the distribution of surviving vernacular buildings in Devon including those constructed of cob.

The methodology lists items considered relevant to the buildings, including:

- The location of the building within a parish.
- The materials used for the construction of the walls and roof.
- Presumed plan forms, based on the siting of the chimneys.
- Architectural details including porches and window types.

The selected items are noted on a record form or card. This is stored in a paper based system. Figure 3.9 illustrates the record form suggested by Alcock (1972: 4).
Alcock commented on the importance of vernacular buildings as evidence of cultural development and economic history. The methodology is not designed to include the historic context of the buildings, nor is reference made to the topographic setting.

PARISH .... Name.................. Return to: Dr.N.W.Alcock,
Address................ 18 Portland Pl., Leamington
Central Grid Ref........ .... Spa , Warwickshire.

		SMALL	MEDIUM	LARGER
SITE	1. Village			
	2. Hamlet (3-10 ho.)			
	3. Isolated			
MATERIAL	4. Cob			
	5. Cob/high stone			
	6. Stone I			
	7. Stone II			
	8. Roof: thatch			
	9. " early slates			
	10. Shaped doorframe stone*			
	11. Shaped doorframe wooden*			
	12. Stone mullions			
	13. Wood mullions			
PLAN	14. 2 end chimneys only			
	15. One end chimney			
	16. Front side chimney			
	17. Other side chimney			
	18. Axial chimney by entrance			
	19. Axial chimney away from entrance			
VARIOUS	20. Slit windows*			
	21. Length down slope			
	22. Porch, single storey			
	23. Porch, 2 storey, thick walls			
	24. Porch, 2 storey, thin walls			

FARM				
	25. Cob	26. Cob/high stone	27. Stone I	28. Stone II
	29. Large Barn	30. Small Barn	31. 2-storey linhey	
	32. Single Storey shelter	33. Closed cowhouse	34. Roundhouse	

REMARKS: Please give details of materials and locations of starred features. It would also be useful to have a list of any buildings with dates inscribed on them.

Figure 3.9 Showing the record form devised by Alcock

Hulland describes an ordered methodology that lists the features of a building in a similar but more detailed manner than the earlier method used by Alcock. Both Alcock and Hulland used recording methodologies that follow similar principles to those described by Brunskill (1988).

Other authors, including the Penoyres (1978), Wade Martins (1980) and Walker and McGregor (1996), have described regional recording methodologies that follow similar patterns or philosophies to those of the methodologies described above. Each methodology is designed to record selected buildings in defined geographical areas for a particular purpose. In the context of the present project it is considered important to review and compare local or regional methodologies.

The methodology, used on the National Trust's Holnicote estate in Somerset, is a typical example (Richardson 1992).

Summary of Recording Methodology used by the National Trust

This methodology was developed to catalogue the buildings on the Holnicote Estate in Somerset. The method employed is designed to create a photographic and written record of each building ancillary to the main house.

The items considered important to list include:

- Exterior features, including walling material, roof shape and roof covering.
- Interior features including roof structure, internal partitions, floors, doors and windows.
- Details of original construction date.
- The plan form of the building and architectural features of interest.
- The condition and conservation requirements of the building.

The individual records are collated and stored in a paper based system. Figure 3.10 shows an excerpt from a record of a small building.

This system has been designed and implemented for a particular purpose: to understand the conservation requirements of vernacular buildings on one estate.

In the United Kingdom, in the past decade, methodologies have been devised that incorporate the use of computerised databases. Two of these have been described by Cox and Thorp (1990) and Ford (1993). Both were designed for the cataloguing of historic farm buildings. The methodology devised by Cox and Thorp (1990) is described below.

Summary of Cox and Thorp's Methodology

This methodology was employed to record and assess selected farm buildings in Kent for Kent County Council in 1990. This is a two tier methodology that is divided between a description and a condition and quality assessment of each of the selected buildings. The descriptive items listed include:

- The location of the building.
- The type, use and plan form of the building.
- The materials used for construction.
- The roof structure.
- Architectural details.
- The development of the building.

The factors selected to assess the condition and quality of the building include:

- The occupancy and use of the building.
- The historic, aesthetic and rarity value of the building.

The storage system is computer based. The results are analysed and the buildings graded according to risk and historic value. Figure 3.11 shows an example of one farm building in the inventory.

.items nosplit
BUILDING INFORMATION

Farmstead reference KFS-000025/ 9 Building name South East Cartshed
PRN 0771 / / 54/ 868 Building category AG

Description
(form, roof materials, wall materials, openings, plan, roof structure, wall structure, floor, development)

Cartshed. 1850. Weatherboarded timber framing on low brick footings; pegtile roof. Open-ended 3-bay cartshed built end onto the north east side of the drive nearest the farm entrance. Very narrow lean-to outshot along south east end (backing onto road) is apparantly an original feature. Roof half-hipped both ends. Neatly-built carpentry with pegged joints. North west side now clad with corrugated iron but originally open. Posts on stone pads with curving arch braces to wall plate and tie beams. Front end weatherboarded above tie beam with loading hatch indicating temporary lofts in roofspace. Rear end contains a small 2-light window. Roof of collared trusses with clasped purlins.

Fittings and mechanisation

Quality assessment
Attractive, well-built and well-preserved component of the deliberately picturesque architect-designed (possibly George Devey) farmstead.

Location In a farmstead Within the vicinity of major listed building yes
Condition Good Occupancy Partially occupied Risk 6 Building grade
Principal present use Wagon shed Historic 2
Other present uses Aesthetic 4
Principal original use Cart/wagon shed Rarity 1
Other original uses Loft storage
Date 1850 to 0000
Detail drawings no Ancient Mon. no Listing grade II
Suggested grade 7
GP

Figure 3.11 Showing example of Cox and Thorp's inventory of Kent farmbuildiings

This recording methodology is an example of the transition from paper based to computer based storage systems and demonstrates the use of a computer system for analysing buildings at risk and assessing their condition and historic value.

Recording methodologies used by English Heritage

The development of Lists of buildings considered to be of special architectural or historic interest began in 1946, in response to the loss of buildings by enemy action following the second world war and to the post war demolition of historic buildings for redevelopment schemes (Cherry 1996a).

These statutory Lists are compiled and updated, with advice from English Heritage, by the Secretary of State for the Department of Culture, Media and Sport under the Planning (Listed Buildings and Conservation Areas) Act of 1990 (English Heritage 1992a).

In addition to the methodology used for compiling Lists of buildings of special architectural or historic interest, English Heritage have also developed a method for assessing Listed* buildings that may be at risk (English Heritage 1992b).

Summary of Recording Methodology for Listed buildings

The original Listing surveys accorded statutory protection to buildings that were identified as of special architectural or historic interest and were geographically based. The buildings for inclusion in the List were Graded* according to their considered importance. The majority, approximately 94%, are categorised as Grade II, the remaining 6% are Grade II* or Grade I .

* see Glossary

For a building to be selected for inclusion in the List one or more of the following criteria needs to be met:

- The individual building is of national architectural importance.
- The building is of historic interest.
- The building has a close historical association with important buildings or events.
- The building contributes to the architectural or historic value of a group of buildings.

The methodology employed involves the sequential listing of identifiable items which include:

- The building type.
- The original date of construction of the building.
- The architect, if known.
- The constructional materials used for the building.
- The plan and form of the building.
- A description of the facade of the building.
- A description of the interior of the building, where possible.
- A description of any special features of the building.
- References to known historical factors about the building.
- The sources of information.

A paper based storage system was established for the original lists. The individual written descriptions are catalogued according to geographical regions and based on parish and local district council boundaries. Several parishes are combined into numbered volumes. These volumes are colloquially referred to as "Greenbacks", a reference to the colour of the original bindings, and more recently as "Bluebacks" for the same reason.

This recording methodology is designed for use with individual buildings or structures and for buildings of group value. The descriptions of the buildings in the Lists are intended to identify the historic buildings and are not intended to represent a system for the comprehensive evaluation of the buildings (Cherry: 1996a).

Figure 3.12 shows an example of a Listed description of a Grade II building.
Apart for the purposes of location, the geographical context of the buildings is not included.

Recently, the data contained in the written descriptions has been transferred into a computerised databased system by English Heritage. This will permit a degree of analysis of the data contained within the Listed descriptions to be undertaken.

Following the accelerated resurvey of Listed buildings in the 1980s, a Listed Buildings at Risk survey was initiated by English Heritage. The results of a national sample survey were published in 1992 (English Heritage 1992b).

Summary of recording methodology for Listed Buildings at Risk

The aim of the Buildings at Risk survey methodology is to provide a system to allow local authorities to identify the numbers of Listed buildings in their administrative area that might be considered to be at risk from neglect.

The methodology utilised is designed to measure the degree of risk of all Listed buildings and to enable the establishment of registers of Listed buildings at risk. Items listed on the form used for the survey are selected from the List descriptions with additional entries for two specified indicators of neglect – condition and occupancy.

ST03NW OLD CLEEVE CP

ROADWATER

4/116 Leigh Barton Farmhouse

GV II

Grange of Cleeve Abbey, now farmhouse. Late medieval in origin, enlarged 1627, majority rebuilt 1811. Rendered over rubble, steeply pitched slate roof, moulded cornice, stone stacks gable ends and to right of entrance, latter said to be dated 1811. Courtyard plan: farmhouse facing East, South wing formerly a private chapel, North East annexe, West front closed by shelter shed. Farmhouse: 2 storeys, 4 bays; 12 pane sash windows, groundfloor tripartite 12 pane sash windows, one left and 2 right of Ham stone trabeated Roman Doric porch with frieze, 3 steps, recessed 6-panel door with side lights. Rear elevation onto courtyard, corrugated iron roof. C20 fenestration, projecting slate hung gable end with attached annexe in North West corner, built as a self contained unit. Annexe: squared and coursed red sandstone, asbestos slate roof, 2 storeys, one bay lit only on North front, large external double stack left of rebuilt entrance wall; right stack inscribed in square plaque 1627 GP (Giles Poyntz) AP. West Somerset slate roofed pentice masking lower portion of stack, carried on 2 circular columns flanking C19 door. Interior: single cell, chamfered beams with scroll stops, ovolo moulded door frame to stairs, first floor room said to contain similar doorcase with plasterwork frieze and badly mutilated fireplace. Upper floor accessible now only from farmhouse, alterations made when room ceased to be residential and became brewhouse and bakehouse, copper vat with stoke hole under to left of fireplace which also contains oven. Cambered pebble pathway links entrance of annexe with that of South wing, said to have been a private chapel, now reroofed with inserted floor and lacking distinguishing features. West side, shelter shed, West Somerset slate roof with C19 door in West West corner. Between circa 1609 and 1691 Leigh Barton was occupied by the Roman Catholic Poyntz family who had a resident chaplain. One of these chaplains, Philip Powel was later martyred at Tyburn in 1646 during the Civil War. It is thought that the annexe provided accommodation for the resident chaplain, though there is an alternative suggestion that it housed 2 female relatives of the builder, Giles Poyntz, who wished to live in religious seclusion. (VAG Report, unpublished SRO, 1973; VCH Somerset, Vol 5 forthcoming).

Figure 3.12 Showing example of a Listed description of a Grade II building

The survey form is divided into the following sections:

- Identification of the building.
- The architectural or historic interest of the building.
- The use and type of building.
- The condition and occupancy of the building.

The condition of the buildings is assessed against a four point scale:

- Very bad
- Poor
- Fair
- Good

The occupancy level of the building is identified as follows:

- Not applicable
- Vacant
- Partially occupied
- Occupied

From the results of the condition and occupancy level assessments a risk grade, based on a scale from 1 – 6, is calculated for each building. Those buildings in risk categories 1-3 are considered to be at risk, those in category 4, are vulnerable and those in categories 5 and 6 are not considered to be at risk from neglect. This empirical risk assessment utilises a computerised database system that allows for the storage and organisation of the data and also allows analysis to be undertaken of the results.

The Buildings at Risk recording methodology demonstrates a computerised system that allows for the rapid location of problem buildings which may warrant further investigation. It is also designed to provide a national standard of risk assessment for Listed buildings

(Brand 1992: 9). Figure 3.13 shows the form devised for the Listed Buildings at Risk survey from which it will be seen that, apart from the location data, it was not considered necessary to include information regarding the history or topographical setting of the buildings.

The author used this methodology to compile a report on Listed buildings for the Exmoor National Park Authority (ENPA) (Ford 1996b).

In the late 1980s the emphasis of English Heritage's policy changed from geographical surveys to thematic surveys (Cherry 1996b). The change of policy allows for thematic studies to be undertaken of use types or classes of buildings. These groups include non-conformist chapels, public houses, buildings designed for defence purposes and farm buildings. Examples of the result of this change of policy are demonstrated by the two farm projects considered below.

Summary of the methodology used for a thematic study of farmsteads in Norfolk

The first of these projects is a pilot thematic study of the List coverage of farm buildings in a specific and agriculturally important region of England.

The aim of the study is to assess the effectiveness of Listing as a mechanism for identifying and managing change in significant historic regional farm buildings (Lake and Hawkins 1998a: 25).

The objective is to consider different factors relating to Listed farm buildings. These factors include whether the weighting in the Lists corresponds to current knowledge of the importance of different building types or whether there is an unbalanced view due to

SURVEY FORM

SURVEY FORM FOR BUILDINGS AT RISK REGISTER (COMPUTER VERSION)

1. IDENTIFICATION

COUNTY : ______ DISTRICT : ______ PARISH : ______

NGR : ______ PRIME REF NO *(Greenback No) ______

LOCALITY : ______ (List Entry No) ______/______/______

St No : ______ St Name : ______

Bldg Name : ______

2. ARCHITECTURAL OR HISTORIC INTEREST

Grade : I / : II* / : II / Unlisted : UL [ ]

No of CA (If not in CA = 0) [ ]

3. BUILDING USE AND TYPE

	Broad Function	Detailed Building Type (See Wordlist)
ORIGINAL	: ______	: ______
CURRENT/LAST	: ______	: ______
Upper Floors (Optional)	: ______	

AG	Barn	CL	Residential over shop	HW	Hospital	RC	Museum
	Farm Building				Workhouse		Theatre
AY	Outbuilding	CO	Monument	IE		RL	Church
	Wall	DM	Terrace House	IT	Institute		Chapel
CX	Hall		Cottage	LW	Courthouse	RS	Hotel
	Townhall		Lodge		Prison	ST	Warehouse
	Government Office		Farmhouse	MP	Brewery	SY	Street Furniture
CL	Bank		Manor House		Maltings	TR	Bridge
	Exchange		Country House		Industrial Mill		Railway Bridge
	Office		House	MT	Fortification		Station
	Post Office		Flats	PO	Watermill		Canal Building
	Public House	ED	Library		Windmill	UT	Utility
	Shop		School		Plant	VA	Repairs
	Retail Warehouse	GL	Garden Building	RC	Cinema		

4. CONDITION

Very Bad : 1
Poor : 2 [ ]
Fair : 3
Good : 4

OCCUPANCY

Not Applicable : 0
Vacant : 1 [ ]
Partially Occupied : 2
Occupied : 3

RISK CATEGORY CALCULATED BY COMPUTER

9. REPORTER'S NAME

DATE

5. OWNERSHIP TYPE

Private : 1
Religious/Charity : 2
Company : 3 [ ]
Local Authority : 4
Statutory Undertaker: 5
Crown : 6

SECTIONS BELOW TO BE FILLED IN ONLY FOR RISK CATEGORIES 1 – 3 All Buildings in Condition 1 Buildings in Condition 2 and Occupancy 1 or Other Buildings of Concern

6. MARKET STATUS

For Sale : Y
Not For Sale : N [ ]

7. OWNERSHIP

Details of Owner/Agent

Name
Address

8. MARKET DETAILS

Asking Price :
As At (Date) :
Floor Area :
Sq M : M :
Sq Ft : F

10. REASON BUILDING IS AT RISK

11. PREFERRED USES

12. ACTION

Figure 3.13 Showing form used for assessing Buildings at Risk certain types being under rated (Lake and Hawkins 1998b: 2). A further objective is to ascertain whether the Lists include farm buildings or groups of buildings that illustrate agricultural development.

The methodology employed includes a combination of desk based research and analysis and a programme of fieldwork. This includes:

- The examination of existing List descriptions.
- The examination of archival and current photographs.
- A comparison of the selection process for Listing with the results of recent research into farm buildings.
- The compilation of distribution maps.
- The compilation of guidelines for assessment.
- Recommendations for the listing or regrading of archetypal farm buildings.

The results of the analysis of the collected data are presented as distribution maps which identify the numbers of Listed farm buildings within the county of Norfolk. These are categorised according to parish, type and period of construction. The maps identify buildings that are poorly represented either by area or by type and also identify the most significant integrated groups of farm buildings or farmsteads.

The descriptive data is stored in a paper based system and a digital mapping system is used for the creation and storage of the distribution maps.

The thematic study of planned and model farmsteads in England

The second thematic study is designed to identify surviving planned and model farmsteads in England and to identify inconsistencies and omissions in the current Lists (Lake and Hawkins 1998c: 1).

The methodology collates and analyses the following information:

- The distribution of known and surviving planned and model farmsteads in England.
- The date of the farmsteads, where ascertained.
- The current List Grade and description of the buildings, if applicable.

Maps have been produced to demonstrate the results of a county by county analysis of Planned and Model farmsteads, both Listed and not Listed. Analysis of the level of usefulness of the information contained in the List descriptions is demonstrated and a detailed gazetteer presented that catalogues documented planned and model farmsteads throughout England.

The two thematic studies demonstrate a regional and a national view of farmsteads. They include comprehensive descriptions of farm buildings and the results have been illustrated with detailed distribution maps. The recording methodology used does not allow for the inclusion of detailed individual grid references nor is the relevance of the surrounding topography discussed.

Recording Methodology developed by the Royal Commission on the Historical Monuments of England (RCHME)

The role of the Royal Commission of Historic Monuments of England, which amalgamated with English Heritage in April 1999, is to identify, survey, interpret and compile records of ancient monuments and historic buildings in England whereas English Heritage's duty is to identify and protect them.

A methodology for the recording of buildings of historical significance, revised and published by the RCHME in 1996, describes a series of stages to be undertaken in order to produce a record of an historic building. Four different levels of recording are described which range from simple written and photographic records to comprehensive, detailed surveys (RCHME 1996).

Each level contains three major elements:

- A written account of the monument or building.
- Drawings of the monument or building.
- Photographs of the monument or building.

The levels specified are:

- Level One. A visual record with information relating to location, age and type. This level is suggested for pilot projects, for identification of buildings for planning purposes and for use where limited resources are available.
- Level Two. A descriptive record, similar to Level One but containing additional information. This includes descriptions and photographs of both the exterior and interior of the building and requires the production of a measured plan of the building.
- Level Three is an analytical record. This contains a written description, a systematic account of details relating to the development of the building and plans and other visual data, including illustrations, showing the appearance and structure of the building.
- Level Four is similar to Level Three, but includes a greater range of measured drawings and a greater depth of historical analysis. This level of recording is only used for important buildings of architectural, social, regional or economic significance.

The number of items specified for inclusion in the written account varies from Levels One to Four. The items include the following:

- The location of the building.
- The building's type, use, date and materials.
- The plan, form, development, architect and builder, if known.
- A more detailed account of form and development supported by evidence.

- The past and present use, machinery linked to the building and its purpose.
- Evidence of demolished structures linked to the building.
- Identification of existing records of the building and their location.
- Additional secondary sources of information about the building.
- The environmental, historic and social context of the building.
- The local, regional or national significance of the building.
- Information from documentary sources, oral and bibliographic references.

The amount of detail required for the drawings and photographic record of the building is given and this also varies according to the Level of recording being undertaken. The recording methodology was originally designed for paper based storage but current versions utilise computerised databased systems as described below.

Current developments in recording methodologies

A databased recording system, MONARCH, (an acronym derived from MONuments and ARCHives) was developed by RCHME to provide for the storage and analysis of data. It was designed as a database for the National Monuments Record and contains information on archaeological sites, excavations and archives as well as architectural monuments and maritime sites. Information can be retrieved by thematic searches using a combination of criteria (RCHME 1998a).

A second comprehensive and standardised methodology for cataloguing information was also initiated by the RCHME in 1998. This was designed to provide a consistent data standard for use when recording buildings or sites. MIDAS, (an acronym for Monument Inventory Data Standard), suggests a series of recommended units of information for inclusion in a database. These can be adapted according to the needs of different user groups (RCHME 1998b).

The Listed Buildings System (LBS), developed by English Heritage and the Department for Culture, Media and Sport, is a database containing information taken from the Listed building volumes, the Greenbacks and the more recent Bluebacks. This current methodology updates the storage of records of Listed buildings in a manner that allows for thematic searching (English Heritage 2000a).

The linking of data contained in the MONARCH, MIDAS and LBS databases, together with aerial photographs of Listed buildings from the Images of England Project, will, in the future, allow for thematic illustrated searching of Listed buildings . The use of photographs will enable Listed buildings to be visualised but the methodology will still remain dependent on the accuracy and amount of data included in the List descriptions.

The suggested future for English Heritage's recording is the development of the links between the different systems and the addition of Geographical Information Systems (GIS). This concept was discussed by Foard (1996: 2), who suggested that relational databases should be developed to enable archaeological data to be viewed alongside other datasets including those related to Listed buildings.

The Archaeology Data Service in York provides written guidelines for the creation, maintenance and use of GIS based digital resources (Gillings and Wise 1998). This is designed for use by other disciplines as well as archaeology and demonstrates that, in England, the use of GIS for developing recording methodologies has been archaeologically led.

GIS, as a methodology for the recording and managing of data, is used for the World Heritage Sites at Avebury and Stonehenge. This conservation and management project, initiated by English Heritage's Central Archaeological Service in 1995, uses

ArcInfo software, produced by the Environmental Systems Research Institute. This is linked to height data from Ordnance Survey digital maps and an associated computer database containing descriptive data and aerial photographs (English Heritage 2000b). An example of results obtained is shown in Figure 3.14.

Discussion

As explained in the introduction to this chapter, only a limited selection of recording methodologies have been chosen for review in this chapter. These illustrate international, national, regional and local responses to the need to categorise, catalogue or describe buildings. The emphasis or focus will, of necessity, differ according to the purpose or need for which they were designed, the storage system utilised and the available technology.

The methodologies reviewed demonstrated an expected bias in content according to authorship or data collection system used. All concur on the importance of identifying and describing the buildings but differ in the aspects considered necessary to list and document. Tables 3.1a and 3.1b illustrate these similarities and differences.

Lettelier (1994b Figures 3.1a and 3.1b), Brunskill (1988 Figure 3.8), and the RCHME (1996) demonstrate methodologies designed for use by professionals and amateurs needing to create inventories or records of individual or groups of particular buildings. In the first two methodologies emphasis is placed on identification and descriptive factors while the latter includes the historic context.

The methodologies described by Bowman (1995 Figure 3.3) for use in New Zealand; by Guillaud (1987 Figure 3.5) for the Région Rhône-Alpes in France; by Conti et al. (1999 Figure 3.6) in the province of Chieti and by Syrová et al. (2000) in the Czech Republic, all focus on specific needs relating to buildings. These include: the grading of historic value, the raising of the profile of a regional technique, the need to interpret local vernacular architecture prior to a reconstruction programme or the locating of specific building techniques. Bowman (1995) concentrates on the location, architectural description and historic context of New Zealand buildings while the French and the Italian methods show less concern with the historical value but include some details of the surrounding topography.

Methodologies designed to consider, select and identify architecturally and historically important buildings for statutory protection, are illustrated by the Portugese state method and the method used by English Heritage. The intention of these methodologies determines that location, architectural features and usage take priority over historic or geographical considerations.

English methodologies, designed for describing particular types of buildings in discrete geographical areas, are represented by the methods used by the National Trust (Richardson 1992 Figure 3.10), Alcock (1972 Figure 3.9), Cox and Thorp (1990 Figure 3.11), and the later methods used by English Heritage. These methods are individually circumscribed by the specific buildings that they are designed to describe, but all conform with the inclusion of base data on identification, location and descriptive items.

In the majority of the methodologies considered, emphasis is placed on identification and descriptive items relating to use and type, materials and constructional techniques and architectural details, as is shown in Tables 3.1a and 3.1b. Less importance is placed on extrinsic factors that may have a bearing on the historical significance or survival of buildings. The more recently developed methodologies, however, demonstrate awareness of external influences on the buildings, including factors relating to the surrounding landscape.

The methods employed to formulate, store and manage records of buildings have evolved from the written document, as used by Brunskill (1988) and others, to computerised database systems. Traditional written records lack flexibility and do not allow for rapid thematic searching or analysis. Database methodologies allow for thematic searching and analysis but their usefulness is dependent on the original design of the database and the amount and quality of the data used.

Conclusions

For the purposes of creating an inventory of cob buildings the perceived limitations of utilising existing recording methodologies are that significant earthen buildings may not comply with established criteria for assessing architectural or historic importance. The earthen walling material and the importance of the building may be revealed from interior inspection and by the appraisal of its geographical setting or known historic background. The established criteria do not generally permit the inclusion of geographical data, except for location purposes, or for the inclusion of historic documentary material.

Cob buildings are regional, vernacular and dependent on local building materials. They are likely to have been sited to take advantage of environmental factors in their surroundings and the proximity of suitable constructional material. Therefore, in order to develop a methodology for creating an inventory of cob buildings a more holistic system is required than those reviewed, one that is capable of containing, analysing and reporting on geological, geographical and historic data as well as descriptive data, and which would be compatible with RCHME's MIDAS system (RCHME 1998b). The information that the proposed methodology will contain is demonstrated in the final field in both Table 3.1a and Table 3.1b. The comprehensive nature of the proposed methodology can be appreciated from the number of items to be included in the database in comparison to those included in the methodologies reviewed in this chapter.

The review of other methodologies also underlines the need for the construction of a methodology which utilises a database appropriate for inclusion into the selected GIS software. The advantages of using a relational database linked to GIS for the recording of historic regional or vernacular buildings has not, as yet, been fully explored.

The next chapter examines the idea of using a relational database, linked to a Geographical Information System, to develop a recording methodology specifically for cob buildings. A recording methodology that would allow for the inclusion of external factors, such as the topographical setting of the buildings, as well as inherent factors relating to the actual buildings.

CHAPTER FOUR – THE STUDY AREA AND THE DEVELOPMENT OF THE PROPOSED RECORDING METHODOLOGY USING A GIS

Introduction

The previous chapter identified that earlier recording methodologies did not emphasise surrounding landscape components or historic documentary evidence. Certain of the later methodologies reviewed, however, do acknowledge the importance of these factors including Lettelier (1994a, see Chapter 3: 57); Lake and Hawkins (1998a, b and c, see Chapter 3: 90-93); RCHME (1998b, see Chapter 3: 93-95); Conti et al. (1999, see Chapter 3: 69-71); and Syrová et al. (2000, see Chapter 3: 71-72). Recognition of the influence of external or environmental factors may be particularly important in respect of earthen buildings, where the relationship between the building and its historical, topographical and geological setting is likely to be a factor in its creation, development and survival.

Landscape and architectural historians have described the siting of historic vernacular buildings and have suggested that this is likely to be on a slope, facing south or south east, in a sheltered position and near a water source (Hoskins 1955, see Chapter Two: 38); (Roberts 1987, see Chapter Two: 41). There is evidence to show links between present settlements and prehistoric ones (Cunliffe 1983, see Chapter 2: 46). Buildings are likely to have been positioned close to communication systems (Taylor 1979, see Chapter 2: 43), and, due to the need to have suitable building materials nearby, the sites may be related to the soils and underlying geology of the locality (Barley 1986, see Chapter 2: 25). Taking these factors into consideration, it was logical to develop a methodology for recording cob buildings that would allow for such contextual information to be included.

To put this idea into practice two requirements needed to be met. The first was to locate a suitable study area with an appropriate density of cob buildings and the second was to explore the potential of using a relational database, linked to a Geographical Information System (GIS).

This chapter describes the choice of study area, and explains the relevance of using a GIS system, linked to a relational database, to develop a method for recording and analysing the cob buildings within the study area.

Choice of Study Area

The study area needed to meet certain criteria: it had to be within Devon and be known to contain a considerable number of cob buildings. Small scale topographical and geological maps of the area were required as were accessible sources of archaeological, architectural and archival material. The parish of Sandford, near Crediton in mid Devon, fulfilled the criteria required. It is a typical parish of the mid Devon area, containing a central settlement with outlying hamlets and individual farmsteads within one administrative area. As with other parishes in the locality it has a history of partial estate ownership with the Davie family of Creedy Park owning 20% of the total acreage in 1839 (Tithe apportionment 1839, see Appendix Two). The parish is shown in Figure 4.1, the boundary indicated by the red line.

Sandford was one of the parishes in the area that had been identified as containing a number of cob buildings. Other nearby parishes that contain numbers of cob buildings include Morchard Bishop, Kennerleigh and Newton St. Cyres. Concern had been expressed as to the condition of these cob buildings and an inventory was required in order to identify the numbers and condition of the surviving structures (Stocks 1995).

Of the total number of buildings in Sandford parish, Listed* by English Heritage, 77% were considered to contain cob in their construction (English Heritage 1985). The total number of dwellings in the parish at the current time is four hundred and sixty six (Mid Devon District Council 2001). The number of Listed dwellings in the parish is ninety seven, in excess of 20% of the current total of all dwellings in the parish.

Sandford also contains subsoil types overlying Carboniferous and Permian rocks which are of a similar type to those that have been studied or are currently being studied for their engineering properties as an earthen building material (Greer 1996, Keefe et al. 2001, Goodhew 2000 and Coventry 2001; see Chapter 1: 7).

Other elements considered to be important were the surrounding topography, archaeology, and historical background of the study area. Suitable small scale topographical maps were available for the whole of the parish of Sandford, (Ordnance Survey 1:10000, Sheets SS70 and SS80, 1972 and 1973), and solid and drift geological maps were available for a part of the parish, (British Geological Survey 1:50000, Sheet 325, 1995).

The nearest meteorological office station to the study area is approximately fourteen kilometres to the west. Records show that the general situation for this part of mid Devon includes prevailing south west winds and an annual rainfall of between 0.89 metres and 1.02 metres per year. The temperatures are generally mild with high average hours of sunshine (National Meteorological Service for the United Kingdom 1995).

Following the decision to select Sandford as the study area, further field visits were carried out and more comprehensive searches undertaken of relevant geographical, archival and

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* see Glossary

bibliographical material. Three sections follow that support the choice of Sandford as a study area. These sections relate to:

1) The cob buildings of the study area.
2) The historic context of these buildings.
3) The geology and the topography of the study area.

1. The cob buildings of the Study Area

As mentioned above, the List of buildings of architectural or historic interest in Sandford includes eighty six buildings, or 77% of the total number Listed, where the walling material is described as being wholly or partially cob (English Heritage 1985).

Within Sandford parish, cob has been used for the construction of a variety of building types, ranging from large farmhouses, village houses and farm buildings to small rural cottages. Small cob buildings are found, such as ash houses* and other domestic outbuildings, as well as garden and boundary walls.

Figure. 4.2[1] illustrates examples from this range of cob buildings including:

a) Combe Lancey, a fifteenth century farmhouse with origins recorded in the Domesday Book*.
b) Dowrich Barn, a sixteenth century barn that was originally a dwelling.
c) The Old Forge, an eighteenth century former cottage and forge.

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* see Glossary
[1] Enlargements of the photographs are included in Appendix One

d) Gaters, a sixteenth century former farmhouse with a large attached barn.

e) Frogmire, a non Listed farmhouse with fifteenth and sixteenth century architectural details.

f) Woolsgrove, a sixteenth century farmhouse with a late eighteenth century facade.

Cob has also been used for the construction of status buildings including two nineteenth century buildings in Sandford village, one of which is the village school, a large building in a classical Greek style of architecture with a pedimented* gable end and Doric* columns (see Figure 1.2f[2] and Figure 6.8). The cob walls of the school are considered to be among the highest still standing in the area (Munday 1985: 131). This building is mistakenly Listed as being constructed of rubblestone, presumably because its walling material is disguised by a stucco* exterior. The school, completed in 1825, was built by Sir John Davie of Creedy Park, formerly the largest estate in the parish. (A case study of this building is included in Chapter Six).

The primary school is only one of a number of interesting cob buildings within the parish. Others include a Saxon farmhouse, Swannaton, and five known medieval houses: Prowse, Dowrich, Ivy Cottage, West Pidsley and Dodderidge (Reichel 1922: 153).

Swannaton is Listed as an early sixteenth century farmhouse with additions from the seventeenth and nineteenth centuries. It is mentioned in the Saxon charter of 997 as Hafoc-combe, the dwelling of a swineherd (Rose Troup 1942: 248).

Prowse, currently a farmhouse and classified as Grade II*, is probably of early sixteenth century date, a high quality building with part of its roof structure considered to be the

* see Glossary

2 An enlargement of this photograph is included in Appendix One

product of a known polite school of architecture that operated within the county of Devon at that date; examples of similar work have been found in Exeter Cathedral Close (Thorp 1995). Prowse Farm barn is also an exceptional cob building. It is an early example of a bank barn with numbered roof trusses* and side pegged* jointed crucks* that descend to ground level. Results from the Devon Dendrochronology Project give felling dates for wood used in the trusses* of Prowse barn as between approximately 1483 and 1490 (Thorp 1995).

Dowrich House, which is partially built of cob, is referred to by Hoskins (1954: 473) as remaining in the ownership of one family, the Dowrish family, from the thirteenth century until the mid-eighteenth century.

Thorp (1995) considers that it is possible that Ivy Cottage is the smallest medieval hall house surviving in Devon that is constructed of cob. The cottage also contains a smoke blackened* roof structure. The dendrochronology result gave a felling date of between 1538 and 1558 for the roof timbers. Only a small number of buildings in the parish were subjected to the dendrochronology dating process, but Thorp considers it is possible that others of similar date to Ivy Cottage may exist.

There is a current East Pidsley but West Pidsley is no longer in existence. The name, Pidsley, is recorded in the Domesday Book*. Pidsley is also included in a terrier, a document that recorded the site and extent of land, of 1598, as is Dodderidge, which has also ceased to exist (Reichel 1922: 153).

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* see Glossary

In addition to Prowse, three further domestic buildings are classified as Grade II*, all of which are constructed of cob (English Heritage 1985). Bremridge is dated to the early to mid sixteenth century and contains ceiling beams with carved bosses*, these are illustrated in Figure 5.3. Higher Furzeland, which is probably of a similar age, has a good example of a plank and muntin* screen and Whiterose, formerly Whiterows, is likewise of mid-sixteenth century origins (English Heritage 1985).

The presence of such buildings in the study area is not surprising considering that Hoskins (1954: 54) suggests that Sandford is likely to have been continuously occupied since its early Saxon origins. Searches of the records held at Exeter and Barnstaple Record Offices reveal references to other buildings, that are not Listed, but which field visits have identified as being constructed of cob. These include buildings in the ownership of the Creedy estate, including Frogmire and Clampitt; the Quicke estate, including West Sandford, and the estate of the Collegiate Church at Crediton, which owned several prebendary* farms in Sandford, not all of which are Listed. (See Chapter Six for further information on Frogmire and two of the prebendary* farms, Aller and Cross, and see Appendix Two for a list of the archival records reviewed).

2. The Historic Context

The importance of the use of documentary evidence has been described in Chapter Two (pages 48-51). In this chapter, literary references and historic documentation that relate to Sandford are discussed in chronological order.

Information from the Devon Sites and Monuments Register (SMR) shows crop marks, enclosures and ring ditches within Sandford parish boundary, indicating early settlement

* see Glossary

patterns. The small irregular fields, enclosed by hedgebanks, around the more isolated farmsteads may be evidence of medieval sites of habitation and farming activity (see Taylor (1975), Chapter Two: 42). Enclosure of the land in this part of the south west occurred slowly, but by the middle of the seventeenth century the study area contained a high acreage of arable land (Thirsk 1967: 74).

Sandford's early existence is recorded in Anglo-Saxon Charters (Reichel 1922); (Rose-Troup, 1942). Perambulations appended to the Charters describe the bounds or boundaries of an area. Reichel refers to a translation of these Charters relating to Crediton, the first Charter being apparently dated 739 but Reichel queries whether this is genuine or a later transcript. He gives a date of 933AD as the time when Eadulf acquired the ownership of the manor and the hundred of Crediton. The Anglo-Saxon Charters give detailed information about a parish and most are written more than a century before the Domesday Book (Reichel 1922). Rose-Troup (1942: 249-250) refers to the Sandford Charter of 930AD in which sites of several of the existing farmsteads in Sandford are mentioned, including Combe Lancey, Swannaton, Ruxford, Henstill and Pidsley.

Rackham (1986: 9) considers the value of studying Anglo-Saxon Charters is that they record details of specific pieces of countryside at the date the Charters were written. These details may include mill streams, hedges, ditches and other items of antiquity including burial barrows, hillforts, trackways and Roman roads. The Charter was a legal conveyance which may also contain details of agricultural practices and common rights. Rackham (1986: 9) also mentions that the Crediton Charters mention eighty two landmarks. Some of these refer to the parish of Sandford, including a lookout tower near the farmstead at Combe Lancey; a ford on the site of Thelbridge bridge and Creedy Bridge (Rose-Troup

1942: 259). Despite the fact that these Crediton charters may be medieval copies of the originals they remain of value in understanding the development of the landscape.

The parish is not directly mentioned in the Domesday Book* of 1087 as, at that date, Sandford was a part of St. Lawrence parish in Crediton. However, it is referred to as part of the Bishop's estate in the Geldroll of 1084, (Reichel 1922: 161).

A deed, dated 11th August 1254, refers to William Ralegh (sic) having a private chapel at Ruxford, one of the most significant buildings in the parish (Gover, Mawer and Stenton 1932). Reichel (1922: 272) refers to a further chapel at another existing farmhouse, Ashe Bullayne, formerly Esse Boleyn, that was licensed for worship in 1407. An owner of the medieval house, Dodderidge, referred to above, is mentioned in the same document as Richard de Doderidge.

Lake (1989) considers that, in the landscape of Devon, the small enclosed family farm had been completed by the beginning of the fourteenth century and Hoskins (1954: 62) refers to the increased status of farmers in Devon in the sixteenth and seventeenth centuries which led to the rebuilding of farmhouses (see Chapter Two page 39). These references indicate that within the study area there may be farmhouses with early origins that have been rebuilt at a later stage.

Ecclesiastical records refer to the prebendary* farms that were in the ownership of the Canons of Crediton. Records relating to the nine prebendary* farms that are in the parish of Sandford give descriptions of the tithes paid by their tenants which indicate the status of these buildings. These are described by Oliver (1846) who quotes from an ordinance, or

* see Glossary

document, of Bishop Stapledon of 1333. This document gives the annual rentals or tithe paid by the prebendary* farms at that date:

• Wolsgrove (Woolsgrove)	16s
• Hempstill (Henstill)	14s
• Rigge (Rudge)	12s
• Alre (Aller)	12s
• Carswell	10s
• Las Crosse (Cross)	10s
• West Sandford	8s
• Cridie (Creedy)	8s

From this document it is apparent that, in 1333, Woolsgrove and Henstill paid a greater tithe than the other farms, which indicates they were of higher value or status. At that date Woolsgrove was held by the Precentor, the principal dignitary of the Collegiate Church of the Holy Cross at Crediton, and comprised about one hundred and two acres (Oliver 1846).

In the *Valor Eccliasticus,* the inventory made of ecclesiastical lands by commissioners for Henry VIII in 1538, the annual penciones, or rents, paid by the tenants are again listed. *Et annuales penciones recepte de duodecim prebendis ejusdem collegii valent per annum videlice:* And annual payments received of the twelve prebends of the same college, true value per annum (Oliver 1846).

The value of the prebendary* farms in Sandford at this date, to which this applied, and the amount of rent paid are as follows:

* see Glossary

	£	s	d
• Wolgrove (Woolsgrove)	2	16	0
• Henstill	2	9	0
• Ridge (Rudge)	2	2	7
• Aller	2	2	0
• Carswill (Kerswell)	1	15	0
• Crosse (Cross)	1	15	0
• West Sandford	1	8	0
• Crede (Creedy)	1	8	0

This again demonstrates the varying value of the prebendary* farms in relation to each other. The order of value and probable importance remains the same. To gain an understanding of the type of agriculture being undertaken it is necessary to consider the composition of the tithes. Woolsgrove, which appears to be the most prestigious of the prebendary* farms, paid tithes in a wide spectrum of payments in kind. *(In redditu assisi).* Farm produce included corn, wool, lamb's wool, a bull calf, butter, cheese, a goose, and a pig. The lesser prebendary* farms appear to have only paid in corn and money. (Translated from the Latin, by the author, from the documents included in Oliver's *Monasticon Diocesis Exoniensis*, 1846).

A copy of a terrier, the Norden terrier of 1598, gives a description of the parish of Sandford. This is a copy of an earlier survey, the original document was destroyed in a fire in 1915 (Rose-Troup 1942: 237). The facsimile of the terrier and its accompanying map are stored in the Devon Record Office (DRO). These report the ownership and siting of

* see Glossary

twenty five of the currently existing cob buildings in the study area and also include buildings that are no longer in existence (see Appendix Two, DRO: 1660A add 4/E1-E3).

An estate map of 1763 depicts in detail the extent of the estate of Ruxford Barton, which was originally one of the largest estates in the study area. This map, also in the Devon Record Office, includes areas of land in the ownership of other estates in existence at that time (see Appendix Two, DRO: B170/107).

Lysons and Lysons (1822) refer to Sandford in the Devon Volume of *Magna Brittannia*. In their description of the parish they include the smaller settlements of West Sandford, Eastern Buildings and New Buildings. They refer to one of the farms, Combe Lancey, as a manor that was known to be in existence during the reign of Henry III (1207 - 1272) and was later owned by the largest of the local landowners, the Davie family of Creedy Park. The Lysons give details of the historic ownership of several other important buildings in the parish including Ruxford Barton, Bremridge, Dowrich and Dodderidge. The owners mentioned by the Lysons include the Chichesters, the Quickes and the Northcotes.

Figure 4.3[3] gives examples of historic cartographical and graphical material, relating to the study area, that was discovered and consulted:

a) and b) are copies of facsimiles of two important maps: John Ogilby's coaching map of 1675 and John Dunn's map of Devon of 1765. Both mark the then important estate of Ruxford, on Ogilby's map this is spelt as Druxford. This coaching map is in strip format and demonstrates that the main coach route between Crediton and the next major town of Barnstaple passed close to the western boundary of Sandford parish.

[3] Enlargements of the photographs are included in Appendix One

c) Shows two parts of the Ruxford estate map of 1763 and illustrates the detail recorded of the estate. The house is shown in outline with the large cob barns coloured in yellow.

d) Shows the cartouche* and one of the properties from the Sandford Tenements Map of 1819, a part of the Davie's Creedy Park estate.

e) Shows a faded map of a part of Creedy Park. This map is of importance as it shows ponds that have since been filled in and which may have been the source of the building material for an interesting building, Frogmire (see Chapter Six, case study on Frogmire).

f) Shows a plan of Park House, a significant building at the edge of Sandford village (see Chapter Six, case study on Park House).

The 1839 Sandford tithe map and tithe apportionment provide a detailed record of the ownership of the buildings and land in the parish[4]. The apportionment comprises a catalogue of buildings and fields and also records landuse (see case studies on Aller and Cross, Chapter Six and also see references in Appendix Two). The tithe map is coloured, with different colours used for dwellings and for outbuildings. This assists in the identification of original dwellings that have later been used as farm buildings and former outbuildings that are now dwellings. An example of a section of the Tithe Map is included in Figure 4.15 and enlargements of parts of the map are included in Appendix One.

The Ordnance Survey maps, from the First Series of 1800 to the present date, illustrate the topography of the study area. These provide an invaluable record of changes that have taken place in respect of previous and present routes and settlements. A part of the Ordnance Survey map of 1888 for the area is illustrated in Figure 4.15 and enlargements are included in Appendix One.

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* see Glossary

[4] Originals of tithe map and apportionment for Sandford are in the Devon Record Office, Exeter.

Munday (1985) has written an interesting history of the village of Sandford, *A Parish Patchwork* (1985), that contains descriptions of buildings in the parish, their histories and the history of previous occupants. It is illustrated with historic photographs and drawings which illustrate changes that have occurred over time. A number of the buildings described and illustrated are now Listed buildings and of importance to this project. A description written by James Ford in 1851 is quoted by Munday. This refers to the fertility of the soil in the area (Munday 1985:1). A further quote is given from a lecture in 1909 by F.G.. Collins, a geologist, who describes the soils of the area (Munday 1985:1). Unfortunately Munday's book contains few references as to the sources of the historic material commented on.

A full list and description of the written, graphical and cartographical documents that were consulted for this project is included in Appendix Two. From these documents a better understanding was acquired of the history of the study area and the cob buildings within it.

3. The Geology and Topography of the Study Area.

An understanding of the geology and topography of the study area is also necessary in order to assess the importance of the geographical context to the development and survival of the cob buildings. As discussed in Chapter Two, geological factors may indicate sources of suitable earthen constructional material, which could help denote early settlement sites, while topographical factors may be of value in identifying significant sites by verifying the proximity of water, road systems and historic field boundaries (Chapter Two pages 35-47).

Sandford lies in the Crediton trough which extends westwards from the Exe valley. The geological map for the area shows that the Parish of Sandford is divided horizontally by two distinct and different geological formations. The northern two thirds of the parish overlie Carboniferous rock and the southern third overlies the younger Permian rock, (British Geological Survey 1:50,000 series, sheet 325 EXETER) (See Figure 4.4).

- The Carboniferous rocks include: The Bude Formation, massive sandstones with siltstones and shales, also known as the Culm Measures. The soils overlying these rocks are of a yellowish brown colour.

- The Permian rocks include: Crediton Breccia, Knowle Sandstone, Bow Breccia, Creedy Park Sandstone. The reddish colour of the soil derived from the Red Sandstone Series of Permian breccias and sandstones is distinctly different to the yellowish brown coloured soils of the northern part of the parish.

The colour of the soil is considered by Edmonds, McKeown and Williams to create a visually attractive landscape (Edmonds et al. 1975: 52). In Sandford these soils do more than enhance the scenery, they also provide a traditional and practical source of building material.

Figure 4.4 also shows other geological materials, important to the construction of cob buildings: lamprophyric lava, sandstone and three different drift materials.

- Lamprophyric and basaltic lavas. In the western part of the parish there are outcrops of lamprophyric lavas within a group of red sandstones, Knowle Sandstone (Edwards and Scrivener 1999: 102).

These lavas are part of the Exeter Volcanic Rocks, isolated remnants of former flows dating to the start of Permian times. A disused quarry in the study area, at Meadowend near Woolsgrove, shows lamprophryic lava to a depth of approximately thirty metres (Edwards and Scrivener 1999: 104).This material, which has a distinctive vesicular structure and purplish brown colouring, has been used for the base plinths of cob buildings situated near the outcrops (see case study on Woolsgrove in Chapter Six). Similar material is found at Killerton, seventeen kilometres east of the study area, which is also used as a building material (Devon County Council 2001; Edwards and Scrivener 1999: 104).

- Sandstone: Blocks of hard sandstone from the Culm Measures are also used for the base plinths of the cob buildings within the study area.

- Drift materials: Probably the most important geological material, from the point of view of the cob buildings, are the Quaternary formations. These include: head, alluvium and river terrace deposits. These are found in the majority of the valleys within the study area.

Head is of particular importance, Scrivener suggests that this was the most likely material to have been used for the construction of the cob walls in the study area as there is a lack of other accessible or suitable building material (Scrivener 1997 and 2002). Three types of head are recognised in the area, namely blanket head with regolith, older head and valley head (Edwards and Scrivener 1999: 132). Valley head is described as follows:

"Valley head consists of locally derived rock debris and may comprise every variation between sandy and silty clay, and clayey and silty sand, with a variable pebble content. The valley head occupies valley sides and bottoms, and probably formed by a combination of solifluction, soil creep and slopewash; the latter two processes continue at the present time. Thicknesses of valley head deposits vary greatly: up to about 6m have been measured in the district, but 1 to 2m is a more usual range. On the published 1:50,000 scale map the deposit is referred to simply as 'head' " (Edwards and Scrivener 1999: 133).

Keene defines head as follows:

"Originally a local farming term for deep rubbly subsoil, it is now used to describe the mantel of unconsolidated material produced, in part, by frost shattering and transported downslope by solifluction" (Keene 1996: 46).

An earlier description by Edmonds et al. (1975) suggests that head may be up to 30m in depth. They comment that head is commonly used as the building material for the construction of cob houses, farm buildings and garden walls with the material likely to have been dug from sources close to the site of the proposed building (Edmonds et al. 1975: 100).

The inter-relationship between the underlying geology of the study area gives an overlying topography that divides the area into two different parts. The junction between the Carboniferous Culm Measures and the Permian Sandstone creates a landscape of high rolling pasture and wooded hills to the north of the area and a more gentle and richly cultivated area to the south. This southern section is identified with the Permian areas in the east of the county.

The shape of the landscape undulates with a height range of between under 40 metres to over 182 metres above sea level, (see Ordnance Survey maps, 1972/1973). The former height is recorded around the Creedy river in the flat meadowland to the south east of the Parish and the latter at the old trig point on the western side of the parish, close to an earlier beacon site. The majority of the parish lies at over 100 metres. There are two distinct ridges running in a west to east direction across the parish, the southerly one, overlying Breccia Sandstone, forms the southern parish boundary. The central ridge overlies the junction between the Carboniferous and the Permian formations. On the northern and north western boundary of the parish there is a more fragmented ridge dissected by stream valleys.

The valleys in the northern section tend to be steep sided, many are wooded, mostly with native broadleaved trees but there are also areas of coniferous plantation. Streams are present at the bottom of the majority of the valleys. The valleys in the southern section are wider, shallower, less wooded and more easily cultivated.

From the ridges the watercourses flow to the north and to the south, all the streams throughout the parish eventually converge on the River Creedy which flows in a south-easterly direction to join the River Exe north of Exeter. There are wide valleys edging the main watercourses running from the north west and the north east of the parish. These join a west to east valley to the south of the parish. On rising ground near the confluence of the valleys lies the main settlement of the parish, Sandford.

Rackham's categorisation of Ancient Countryside, described earlier (Chapter Two, page 44), depicts an area that contains hamlets, ancient isolated farms, irregular hedges of mixed species with roads that are often sunken and many footpaths, an area that is usually well wooded and that contains many antiquities from all periods (Rackham 1986:4). This is true of the study area.

Figure 4.5 shows examples of typical landscapes within the study area (Photographs by the author, 2000).

Photograph a) is taken overlooking the reddish soils in the south of the parish. Within the view can be seen some of the raw materials necessary for the construction of a cob building: the red subsoil showing in the ploughed field, sheaves of wheat used for the thatch* roofing material and evidence of hedgerow trees that may provide timber suitable for roof structures. Wool from the sheep in the background can be added to interior plastering material.

Photograph b) shows a typical group of cob buildings sited within the landscape of the study area. The group of buildings faces south-east and is protected from the north and west by the configuration of the land.

Sandford parish comprises a number of settlements with the name of the parish taken from the largest of these. As well as the main settlement of Sandford there are smaller hamlets at West Sandford and New Buildings to the west of the parish and East Village near the eastern boundary. There was formerly a hamlet of Preston, now reduced to a farm and cottages, but which still contains a Listed building, Whiterose, with architectural features that demonstrate former status.

Roads traverse the village following both ridge routes and valley routes. One early route is the road that crosses the Creedy Bridge in the south-eastern corner of the parish which is

* see Glossary

mentioned earlier in this chapter (see page 111) as being included in a charter of 739AD, (Rose-Troup 1942: 259). Later roads include a mid-eighteenth century turnpike route or toll road, (Chapter Two, pages 39 and 44). This road enters Sandford in the south of the parish and takes a north-westerly route passing through New Buildings and continuing to the neighbouring parish of Morchard Bishop (see Figure 4.1).

Field boundaries form an important part of the topography of the study area. The field shapes and patterns may help to identify original constructional dates for buildings and illustrate economic and social development in the parish (Taylor 1975, see Chapter Two, page 42). The pattern of field boundaries in Sandford parish indicate that the area is likely to have been occupied and the land cultivated over many centuries (see Chapter Five, Figures 5.1 and 5.10).

The criteria required for the chosen study area were outlined in Chapter One (page 10). These included a number of known cob buildings, relevant small scale topographical and geological maps, and germane archival records. The variety of available information, described in the above three sections, support the choice of Sandford as a suitable study area.

In order to meet the original requirements of the research project a comprehensive system is now required that will create an inventory of the cob buildings that permits the inclusion of the varied historical and geographical information described.

The Proposed Recording Methodology for Cob Buildings in Sandford

The concept of using a Geographical Information System (GIS) for developing an inventory of cob buildings was introduced in Chapter One and also discussed at the close of Chapter Three. A Geographical Information System utilises data that is geographically referenced. It is a system that is capable of integrating and managing diverse datasets (Gillings and Wise 1998: Section 2.1). GIS software interacts with maps as geographic databases rather than merely creating maps as drawings (Zeiler 1994: 38).

The advantage of using such a system for cataloguing regional cob buildings is that it can combine databased descriptive data, relating to the buildings in the area, with digitised spatial data relating to the topography of the area. It allows information about the buildings and their relationships with their surroundings to be analysed and presented in an easily understandable form. It also allows for the storage and display of graphic and cartographic material, both historic and current, that may be of relevance to understanding the siting, age and significance of the buildings. Figure 4.6 schematically illustrates the ability of a GIS to gather together these varied sources and types of data for comparison and integration.

The choice of Geographical Information System

For managing, integrating, displaying and archiving the selected data the work was started on a Unix based suite of GIS software programs. These were ArcInfo (7.2.1) and ArcView (3.1), both of which were developed by the Environmental Systems Research Institute, (ESRI). ArcInfo is described as a powerful but complex analytical tool which permits data from disparate sources to be displayed, unexpected relationships to be discovered and correlations proposed and tested (Zeiler 1994: 68).

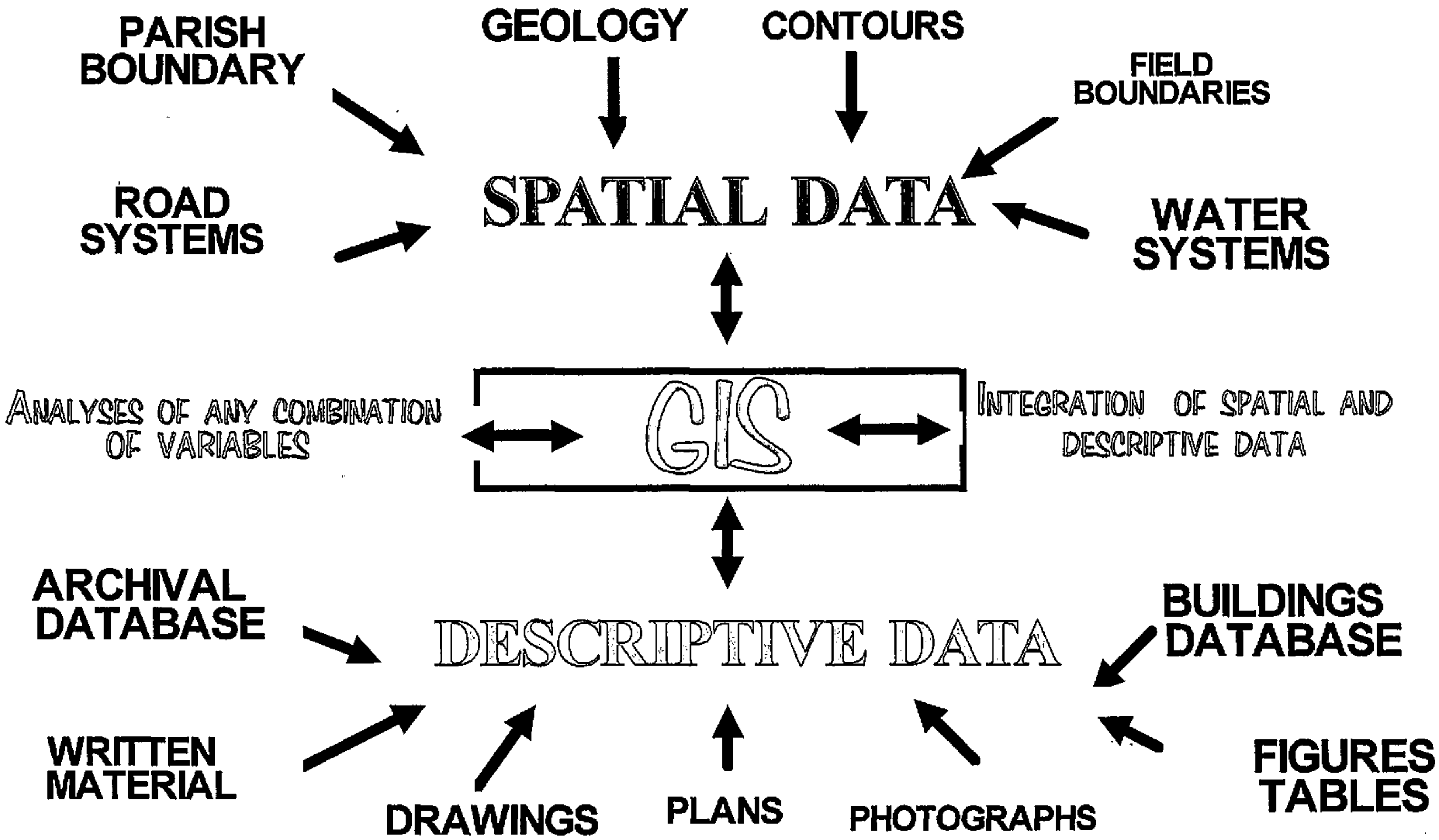

Figure 4.6 Illustrates the use of a GIS to analyse differing variables

A dBASE IV database was chosen for the input of the descriptive data relating to the buildings. At a later date in the research programme the data was transferred to PC versions of the GIS software. For the purposes of display only, the database data was transferred into a Microsoft Office 97 Excel spreadsheet which is illustrated in Table 4.1. Microsoft Office 97 Word and Adobe Photoshop 5.0 software were used to collect and store written, graphic and cartographic material that could not be included in the relational database. This material was then incorporated into ArcView.

<u>The collection and organisation of the descriptive data</u>

As the original concern regarding the survival of cob buildings in mid Devon centred on those that were included in the List of buildings of architectural or historic interest, it was decided to use these buildings as the core data of the database (English Heritage 1985).

It is acknowledged that the information contained in the List, which is necessarily dependent on the knowledge of the personnel undertaking the Listing, may be considered subjective and to contain an element of bias. However, a List is the standard by which the merit of historic buildings is determined and they contain a comprehensive summary of the attributes of each individual building. The List was considered, therefore, to be a valid data source for the purposes of this project.

Data from the List are entered into the relational database according to the criteria of English Heritage (see Chapter Three, pages 85, 86 and 87). Key items, including identification, location, type and original date, are available for all the Listed buildings, but those where the interior was not examined at the time of the original inspection and Listing, lack information regarding internal details.

It was also decided that the database should contain all the Listed buildings in the parish, whether described as being constructed of cob or not. This was because field visits to Sandford had identified certain Listed buildings, with walls partially or wholly made of cob, that had been erroneously recorded as being of rubblestone. (A case study on one of these buildings, the primary school, is included in Chapter Six).

In addition to data gained from the Lists further information about the buildings was acquired from field visits to the study area and information discovered in references to the buildings found in publications such as the *Place names of Devon* (Gover, Mawer and Stenton 1932); the trade directories for the area; editions of the *Transactions of the Devonshire Association* and a history of the parish (Munday 1985). From the field visits to the study area oral evidence was gained from present and previous owners and visual evidence from observation.

One hundred and twelve Listed structures were included in the database together with a further twenty two buildings that were not Listed but which information gained from archival searches, and the sources referred to above, had revealed to be of historic interest, and which were likely to be constructed of cob.

Archaeological data relating to Sandford parish, and to specific buildings, within it, was sourced to the County Archaeologist's office and historic documentary evidence to the County Record Ofices in Exeter and Barnstaple (see Appendix Two). The evidence collected was in a variety of formats. Material that could not be contained in document or tabular files was photographed or photocopied, and then scanned and stored as image or bitmap files.

The construction of the relational database

A dBASE IV database was chosen as the relational tabular database to be used for the input of the descriptive data.

Forty of the items included in the database fields have been suggested by the written information contained in the Listed descriptions and from items included in *the Buildings at Risk Survey* (English Heritage, 1992b). The final eight items are specific to the study area and relate to information obtained from the various sources referred to above. The database fields were grouped in the order suggested in *the Monument Information and Data Standard Manual* (MIDAS) produced by the RCHME (1998b).

The field groups relate to:

- Identification and location, (9 fields).
- Architectural characteristics, (28 fields).
- Historic Context, (8 fields).
- Additional information, (3 fields).

Details contained in these data fields are as follows:

Identification and Location Fields A - I

Column	Description	Computer Title
A	Individual identification number or prime record number	COB_ID
B	The English Heritage identification number	EH_ID
C	The name of the building or structure	NAME

D	Twelve figure National Grid Reference for the building	GRID_REF
E	Map reference of 1:10,000 Ordnance Survey map sheet	MAP_REF
F	Post code for the building, where applicable	POST_CODE
G	The county name, Devon	COUNTY
H	The parish name, Sandford	PARISH
I	Location of building within parish, where applicable	LOCATION

Architectural Characteristics Fields J – AK

J	Listed Grade* for the building	GRADE
K	Aspect or orientation of the building	ASPECT
L	Number of storeys	STOREYS
M	Current type of building, English Heritage code letters	CURR_TYPE
N	Current use of the building, defined by code letters	CURR_USE
O	Original type of building, defined by code letters	ORIG_TYPE
P	Original use of the building, defined by code letters	ORIG_USE
Q	Approximate century of original construction	ORIG_DATE
R	Approximate century of additions to the building	ADD_DATE
S	Wall material used for construction of the building	WALL_MAT
T	Material used for constuction of chimney stack	STACK_MAT
U	Material used for roofing	ROOF_MAT
V	Shape of roof	ROOF_SHAPE
W	Original plan type of the building	ORIG_PLAN
X	Presence of a cross wing	CROSS_WING
Y	Details of original door types	DOOR_TYPE
Z	Details of original window types	WIND_TYPE

* see Glossary

AA	Details of original flooring type	FLOOR_TYPE
AB	Details of original stair type	STAIR_TYPE
AC	Type of roof structure	ROOF_STRUCT
AD	Number of roof bays	ROOF_BAYS
AE	Types of moulding used	MOULDING
AF	Types of purlins used	PURLIN_TYPE
AG	Siting of chimney stack	STACK_TYPE
AH	Types of beam decoration used	BEAM_TYPE
AI	Types of decorative plaster used	PLASTER
AJ	Details of joinery used	JOINERY
AK	Details of render material	RENDER

<u>Historic Context Fields AL - AS</u>

Fields were created for specific documents that identify the existence of buildings, or the site of buildings, in the study area at a known date.

AL	Building in Devon Sites and Monument Register	SMR_REF
AM	Date of documentary evidence found	DOC_REFS
AN	Buildings that were formerly prebendary farmsteads	PREB_FARM
AO	Buildings shown on the Nordern Terrier of 1598	NORDERN
AP	Buildings that are shown on maps of known date	MAPS
AQ	Owner at time of Tithe Map and Apportionment	OWNER 1839
AR	Acreage of land on Tithe Map	ACRES 1839
AS	Buildings in Gover, Mawer and Stenton, 1932	G,M&S

Additional database fields

Additional fields were added to the tabular database to accommodate references to other architectural detail, historic evidence and to the proximity of the geological material, head, considered to be of importance in the construction of cob buildings.

AT	Details of important additional architectural details	EXTRAS
AU	Historic evidence and further references	COMMENTS
AV	Whether building in proximity to head material	HEAD

Table 4.1 shows the database fields. The full table extends over six pages and only the first twenty seven buildings are presented. (For display purposes the database is shown as a Microsoft Office 97 Excel spreadsheet, the complete table is shown in Appendix Three).

	A	B	C	D	E	F	G	H	I
1	Cob Identification No	English Heritage No	Buildings Name	Grid Reference	Map Reference	Post Code	County	Parish	Location in Parish
2	COB_ID	EH_ID	NAME	GRID_REF	MAP_REF	POST_CODE	COUNTY	PARISH	LOCATION
3	101	11/74	Cross Cottage	284582/105499	SS80NW	EX17 4BZ	Devon	Sandford	East Village
4	102	11/75	Dira farmhouse	284872/105545	SS80NW	EX17 4DP	Devon	Sandford	East Village
5	103	11/76	Dira barn	284895/105560	SS80NW		Devon	Sandford	East Village
6	104	11/78	Dowrich House	282658/105070	SS80NW	EX17 4EQ	Devon	Sandford	
7	105	11/79	Dowrich Cottage	283090/104973	SS80NW	EX17 4EH	Devon	Sandford	
8	106	11/80	Dowrich Outbuilding	282671/105090	SS80NW		Devon	Sandford	
9	107	11/81	Dowrich Gatehouse	282667/105038	SS80NW		Devon	Sandford	
10	108	12/32	Downhayne Farmhouse	283767/106329	SS80NW	EX17 4DN	Devon	Sandford	Downhayne Lane
11	109	12/33	Fishers Cottage	284357/105151	SS80NW	EX17 4BY	Devon	Sandford	East Village
12	110	12/34	Dodderidge Farmhouse	283767/106329	SS80NW	EX17 4BY	Devon	Sandford	East Village
13	111	12/35	Oaklands Cottage	284193/105104	SS80NW	EX17 4BY	Devon	Sandford	East Village
14	112	12/36	Oaklands	284179/105102	SS80NW	EX17 4BY	Devon	Sandford	East Village
15	113	12/37	The Chantry	284152/105093	SS80NW	EX17 4BX	Devon	Sandford	East Village
16	114	12/38	Lillybrook Cottage	293954/105072	SS80NW	EX17 4BX	Devon	Sandford	East Village
17	115	12/52	Prowse Farmhouse	284350/105492	SS80NW	EX17 4BZ	Devon	Sandford	Prowse Lane
18	116	12/53	Prowse Barn,granary, shippon	284330/105481	SS80NW		Devon	Sandford	Prowse Lane
19	117	12/54	Prowse Cottage	284078/105515	SS80NW	EX17 4DW	Devon	Sandford	Prowse Lane
20	118	12/65	Burrowland Cottage	281860/105281	SS80NW	EX17 4EL	Devon	Sandford	Spicers
21	119	12/66	Ivy Cottage	281796/105514	SS80NW	EX17 4EL	Devon	Sandford	Spicers
22	120	12/67	Hynams	281886/105683	SS80NW	EX17 4EL	Devon	Sandford	Spicers
23	121	12/75	Swannaton Farmhouse	280946/105647	SS80NW	EX17 4EW	Devon	Sandford	Swannaton Lane
24	122	21/72	Brendon Cottage	277894/103707	SS70SE	EX17 5NZ	Devon	Sandford	
25	123	21/84	Higher Bagborough Cottages	278032/104666	SS70SE	EX17 5NY	Devon	Sandford	
26	124	21/85	Higher Furzeland Farmhouse	278410/103508	SS70SE	EX17 5NX	Devon	Sandford	
27	125	21/86	Higher Furzeland coachhouse,	278426/103459	SS70SE		Devon	Sandford	
28	126	21/87	Higher Furzeland linhay	278426/103498	SS70SE		Devon	Sandford	
29	127	21/88	Higher Woolsgrove	279297/102959	SS70SE	EX17 4PJ	Devon	Sandford	

Table 4.1
Showing Identification and Location Fields A-I (continued over)

	J	K	L	M	N	O	P	Q	R
1	Grade	Aspect from Front	Nos. Of Storeys	Current Type	Current Use	Original Type	Original Use	Original Date	Additions Date
2	GRADE	ASPECT	STOREYS	CURR_TYPE	CURR_USE	ORIG_TYPE	ORIG_USE	ORIG_DATE	ADD_DATE
3	Two	southwest	Two	Cottage	DM	Farmhouse	DM	C17	Late C19
4	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C17	LateC18
5	Two	east	One	Barn	AG	Barn	AG	C17	
6	Two	southeast	Two	Farmhouse	DM	Manor House	DM	C16	C19, C20
7	Two	northwest	Two	House	DM	Cottages	DM	C18	C19
8	Two	southeast	Two	House	DM	Kitchen bakehouse	AY	C15	C19; C20
9	Two		One	Gatehouse	AY	Gatehouse	LW	C16	C19
10	Two	southeast	Two	Farmhouse	DM	Farmhouse & Cottage	DM	C19	C20
11	Two	south	Two	Cottages	DM	Cottages	DM	C18	C20
12	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C16	Late C19
13	Two	south	Two	Cottage	DM	Cottage	DM	C18	C20
14	Two	south	Two	House	DM	Cottages	DM	C17	Late C19
15	Two	south	Two	House	DM	Cottages	DM	C16	C20
16	Two	south	Two	House	DM	Farmhouse	DM	C17	C18; C20
17	Two Star	south	Two	Farmhouse	DM	Manor House	DM	C15	C16; C20
18	Two	west	One	Barn	AG	Barn, granary, shippon	AG	C16	C19
19	Two	southeast	Two	Cottage	DM	Cottage	DM	C17	C20
20	Two	southwest	Two	House	DM	Farmhouse	DM	C18	C20
21	Two	south	Two	Cottage	DM	Cottage	DM	C19	C20
22	Two	east	Two	House	DM	Farmhouse	DM	C16	C18,C20
23	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C16	C17,C19
24	Two	southeast	Two	Cottage	DM	Two cottages	DM	C18	C20
25	Two	southeast	Two	Two Cottages	DM	Two Cottages	DM	C18	C20
26	Two Star	southeast	Two	Farmhouse	DM	Farmhouse	DM	C16	C17, C19
27	Two	west	Two	Coach house	AL	Outbuildings, stables	AL	C17	C18
28	Two	north	One	Linhay	AG	Linhay	AG	C17	C18
29	Two	southwest	Two	House	DM	Farmhouse	DM	C17	C19

Table 4.1 (continued)

Showing Architectural Characteristics Fields J-R (continued over)

	S	T	U	V	W	X	Y	Z	AA	AB
1	Wall Material	Stack Material	Roofing Material	Roof Shape	Original Plan	Cross Wing Present	Door Type	Window Type	Floor Type	Stair Type
2	WALL_MATER	STACK_MATE	ROOF_MATER	ROOF_SHAPE	ORIG_PLAN	CROSS_WING	DOOR_TYPE	WINDOW_TYP	FLOOR_TYPE	STAIR_TYPE
3	Cob	Cob, rubblestone	thatch	gable	L shaped					
4	rubblestone	rubblestone	slate	gable	E shaped	yes	C17 moulded	sash, casement	flags	dog leg
5	Cob		thatch	half-hipped, gable						
6	rubblestone	rubblestone	slate	gable	3 room, cross passage	yes	C16 ashlar	sash, casement		
7	Cob	rubblestone, brick	slate		2 and 1 room cottages			casement		
8	Cob	rubblestone, brick	slate	gable	1 room			C19 casement		
9	rubblestone									
10	rubblestone	rubblestone, brick	slate	gable	2 room and 1 room		panel	sash		
11	Cob	rubblestone, brick	thatch	hipped	2, 2 room cottages			casement		
12	Cob	rubblestone, brick	slate	gable	3 room		panel	casement		
13	Cob	rubblestone, brick	thatch		1 room			casement		
14	Cob	rubblestone, brick	thatch		2, 2 room cottages			sash		
15	Cob	rubblestone, brick	thatch		3 room, cross passage		plank	casement		winder
16	Cob	rubblestone, brick	thatch		3 room, cross passage			casement		
17	Cob	rubblestone, brick	thatch	hipped, gable	3 room, cross passage	yes	C15 studded oak plank		stone	
18	Cob		corr. iron	half hipped						
19	Cob	Cob, rubblestone	thatch	gable	2 room			casement		
20	Cob	Cob, rubblestone	thatch	hipped, half hipped	2 room, cross passage			casement		
21	Cob	Cob, rubblestone	thatch	gable	2 room			casement		
22	Cob	rubblestone, brick	thatch	gable	3 room	yes		C18, C19,C20		winder
23	Cob	rubblestone, brick	slate	gable	3 room, cross passage		C17 frame with scrolls	C20		
24	Cob	Cob, rubblestone	thatch	half hipped, gable	2, 1 room cottages			C20 casement		
25	Cob	rubblestone, brick	thatch	hipped	2, 2 room cottages			C20 casement		
26	Cob	Cob, stone	thatch	gable	3 room, cross passage		chamfered frames	C17, C19, C20		C17 straight, wind
27	Cob		corr.iron (was thatch)	half hipped						
28	Cob		corr.iron (was thatch)							
29	Cob	rubblestone, brick	thatch		3 room			C19		

Table 4.1 (continued)
Showing Architectural Characteristics Fields S-AB (continued over)

	AC	AD	AE	AF	AG	AH	AI	AJ	AK
1	Roof Structure	Nos of Roof Bays	Moulding Type	Purlin Type	Stack Position	Beam Type	Plasterwork Type	Joinery Type	Render Type
2	ROOF STRUC	ROOF BAYS	MOULDING	PURLIN TYP	STACK TYPE	BEAM TYPES	PLASTER	JOINERY	RENDER
3					axial, lateral, end	double ovolo; chamf. with scroll stops			
4	A frame, collar		ovolo, chamfer		lateral, end	chamf. with step stops	cornices, friezes	dovetail lapjoint	
5	A frame, collar	five						pegged lapjoint	Plaster
6	jointed cruck	four, four		butt	lateral			sidepegged, dovetail lapjoint	
7					lateral, end				
8	jointed cruck		ogee	butt		chamfered		sidepegged	Plaster
9									
10					axial, end				
11					end	plain chamfer, cross and axial			Plaster
12					lateral, end				
13									
14	A frame, collar	two, two				chamfer with scroll stops; axial			
15	jointed cruck	two, two	ovolo			chamfer with step stops, chamfer with scroll			Plaster
16	truss				end, central	chamfered axial with step stops			
17	jointed cruck	four	Tudor rose	butt	lateral, end	chamfered, runout stops, moulded and plain		sidepegged	Plaster
18	jointed cruck	three						sidepegged	Plaster
19						axial with straight cut stops			Plaster
20					axial, lateral				
21									Plaster
22	common rafter				lateral, end	chamfered with step stopped cross			
23	jointed cruck	four			lateral, end	axial, chamfered with runout stops	cornice	sidepegged	roughcast
24									
25									
26	A frame, collar				lateral			pegged lapjoints to collar	
27	A frame, collar	seven						pegged lapjoints to collar	
28	A frame							pegged lapjoints, tusk tenons	
29									Plaster

Table 4.1 (continued)
Showing Architectural Characteristics Fields AC-AK (continued over)

	AL	AM	AN	AO	AP	AQ	AR	AS
1	Included in SMR	Documentary Refs.	Prebendary Farm	On Nordern Map	On Other Maps	Owner in 1839	Acres in 1839	Ref. In Place Names
2	SMR_NO	DOC_REFS	PREB_FARM	NORDERN	MAPS	OWNER_1839	ACRES_1839	G,M&S
3						Davie		
4		18C		Yes		Davie	213	Yes
5						Davie		Yes
6	Yes	13C		Yes	19C	Clayfield	243	Yes
7						Clayfield		
8						Clayfield		
9						Clayfield		
10	Yes	10C		Yes				Yes
11								
12		13C				Horwell	56	Yes
13								
14								
15								
16		13C		Yes		Davie		Yes
17	Yes					Davie	211	
18						Davie		
19								
20	Yes					Crediton Trustees	22	
21								
22						Crediton Trustees		
23	Yes	14C		Yes		Lake	125	
24						Pope		
25						Kelland	59	
26		14C				Gregory	79	Yes
27						Gregory		
28						Gregory		
29						Luxmore	30	

Table 4.1 (continued)
Showing Historic Context Fields Al-AS (continued over)

	AT	AU	AV
1	Extra Characteristics	Other Comments	Sited near Head Material
2	EXTRAS	COMMENTS	HEAD
3			Yes
4	hoodmoulds		Yes
5	strap hinges		Yes
6		Core of house C16, Cob walls to garden.	Close
7			
8	massive fireplace	Smoke blackened roof, probably original Manor house. Hoskins: ?12C	
9			
10		Recorded on SMR as being a Saxon settlement	
11			Yes
12	4-panel moulded oak beam ceiling	Cob walls to garden	Yes
13		Part of Oaklands	Yes
14	brick side oven		Yes
15	stone side oven	Smoke blackened roof	Yes
16			
17	Panelled ceilings	Exceptional smoke blackened roof, earlier chapel, oak doorways, oak plank and muntin screen	
18	Pigeon holes and C17 owl hole	Later C19 engine house. Projecting midstrey walls. Felling date of 1483 - 1490 (Thorne)	
19			
20	adjoining byre and loft		
21	outshuts to rear		
22	side oven		
23	Internal jetty, oak post with jowled head	Smoke blackened roof, mentioned in charter of 997	
24			
25			
26	brick oven, plank and muntin screen, C17 panelled screen	Carved inscription TG 1704	Yes
27			Yes
28		Alcock's Type T1 linhay. One post circular cob on stone plinth (like Woolsgrove).	Yes
29	Rear kitchen wing , original details covered or changed		Close

Table 4.1 (continued)
Showing Additional Detail Fields AT-AV

The construction of the spatial datasets

The selection of the variables for inclusion as spatial datasets is based on geographical items identified as potentially important to the siting of buildings from the literature relating to landscape history and development (see Chapter Two, pages 38-47).

The literature implies that the buildings are likely to be sited on a slope, facing towards the sun, with a water source and road nearby. They may also be adjacent to field systems that show evidence of antiquity and, as the buildings are dependent on local building materials, they may have been sited near a suitable source of such materials. The spatial data that would assist in the understanding of the siting of the cob buildings is, therefore, likely to be related to particular elements: the shape of the landscape, the sources of water, the proximity of roads, the presence of field systems, and the solid and drift geology of the chosen study area.

The topographical variables selected therefore, are as follows:

1) The parish boundary: it was necessary to include this boundary so as to delineate the study area under consideration.
2) Contours: to show the height of the land above sea level and to illustrate the shape of the landscape.
3) Water systems: individual buildings and settlements are dependent on sources of water.
4) Road systems: important to the siting of the cob buildings. As modern roads may be based on the routes of earlier trackways they may also indicate the siting of early settlements.

5) Field boundaries: may indicate early settlement patterns and be of potential value in predicting the original date of existing farmsteads.
6) Geology: the inclusion of the geology allows for the identification of probable construction material used for cob buildings.

All these variables are shown on 1:10,000 Ordnance Survey (OS) or 1:50,000 British Geological Survey (BGS) maps and all are capable of being geographically referenced.

A GIS depicts an area of landscape by using separate themes to create data layers. For this project vector datasets were created for each separate theme or variable. In vector datasets the spatial position of features can be fixed using geographical co-ordinates. The data is entered as discrete points, or as points linked together to form discrete lines, (arcs), or as points linked together to form enclosed areas: polygons. The points, lines and polygons are referred to as features. Only one type of feature is used for each dataset. Points are used to create a dataset for individual structures, such as buildings; lines are used for linear structures, such as roads, water courses or boundaries; polygons are used to outline and enclose specific areas.

In ArcInfo the basic unit of storage for the individual vector datasets is a coverage. For this project each individual coverage relates to a different selected geographic or geological variable: the parish boundary, the road system, the water system, the field boundaries and the geology. The selected cob buildings, which were entered as point features, form a further coverage. The features, (points, lines and polygons), that are put into the individual coverages create data layers as in a thematic map (Zeiler 1994: 69-70).

Entering the spatial data into ArcInfo

The source of the spatial data used were the six 1:10,000 OS map tiles on which the study area is sited. The variables required were digitised from the relevant OS map tiles with the permission of the controller of Her Majesty's Stationery Office (see Acknowledgements). These map tiles are based on the Great Britain National Grid which is constructed on a Transverse Mercator Projection on the Airy Spheroid, OSGB (1936) Datum. The height values are given in metres above mean sea level at Newlyn (Cornwall).

The six OS map tiles used, identification numbers SS70NE; SS70SE; SS80NW; SS80SW; SS80NE and SS80SE, are from the mid Devon area. The geological data was traced from the original 1:10,000 British Geological Survey 1:50,000 Sheet 325 (Exeter) with the permission of the Director (see Acknowledgements).

To enter the spatial data into ArcInfo from the six OS map tiles and the tracing of the BGS drawing, a digitiser was used. The 1:10,000 map tiles were positioned on the digitising table and the corners of each tile were used for the four registration, or tic, points. The co-ordinates for each registration point give the co-ordinates for each individual map tile and allow for the accurate placing of the point, line and polygon features so that thematic maps of combined coverages can be created. Following the registration of the co-ordinates for each map tile, vector datasets of the parish boundary, (pb), the contours, (ct), the roads, (rd), the water systems, (rv), and the field boundaries, (fb), shown on that map tile were digitised as arc features. (An arc is constructed from a connected string of digitised line segements, effectively tracing the selected geographical variable into ArcInfo). The vector datasets were stored in ArcInfo as separate coverages, identified by the map identification number plus the two letters identifying the variable: thus the parish boundary coverage for the northern edge of the parish is identified as SSNW70pb.

To enable analysis to be carried out on the whole of the study area, the individual coverages were joined together using the Append and Build commands in ArcInfo. The individual and the combined, or seamless, coverages were then exported to ArcView. (Within the ArcView program the datasets are organised in a project file and the individual coverages are referred to as Themes. A selection of Themes can be entered into a View from which Layouts may be created for display purposes).

The created coverages for each map tile are shown in Figure 4.7 and the combined, or seamless, coverages for the parish boundary, contours, roads, rivers and field boundaries are shown in Figures 4.8 to 4.11. A layered map showing the combined coverages for the parish boundary, contours, roads, rivers and field boundaries is shown in Figure 4.12.

For map tile SS80SW there is a sixth coverage: geology. At the time of data collection this was the only complete map tile of the study area that had been geologically mapped. Although it was not possible to provide a complete geological coverage for the whole parish this one section provided solid and drift geological information for the main area of settlement within the study area. The geology was digitised as polygons, (areas encompassed by a set of arcs), with point labels to identify the different solid and drift materials. This is shown in Figure 4.13.

A separate dataset was created of the selected cob buildings of the study area. The buildings were digitised from the map tiles as point features, each of which is identified by an individual number, or ID. This dataset was stored in ArcInfo as a coverage and then exported to ArcView. Figure 4.14 shows the layered map of all the combined spatial coverages, including the geology coverage for part of the study area, as well as the buildings.

Problems encountered in creating the coverages

Zeiler comments that using ArcInfo software can be a daunting experience, this proved to be true (Zeiler 1994: 3).

1) Problems occurred when digitising the arcs; small gaps left between some of the nodes at the start and end of the lines had to be corrected by using the Snap facility in ArcEdit. Closing the gaps was particularly important for the geology coverage as any gaps in the arcs prevent the defining of the polygons.

2) Problems occurred with the combining of the different map tile coverages to form the seamless coverages: the contours of five of the map tiles used are marked in feet above sea level, but one map tile has metres above sea level. This caused difficulties in linking this particular map tile to the surrounding tiles.

3) Problems occurred when attempting to create digital elevation models (DEM's) from the digitised contours. DEM's for part of the study are shown in Figure 4.16 and in Chapter Five, Figure 5.7.

Integration of Descriptive and Spatial Datasets

The introduction to this chapter commented on the need to recognise the relationship between earthen buildings and their historical, topographical and geological setting. Paper based maps give a representation of the topographical features but do not allow for questioning or analysis. However, digitised maps linked to databases containing descriptive data relating to the buildings will allow analysis to be undertaken.

In ArcInfo two types of files are created for each coverage: a coverage file and an attribute table. The coverage file contains the positional information, the x and y co-ordinates, for all the features used in a coverage and are linked to the attribute table by an internal sequence number. The attribute table gives details about the different features used including the type of feature: point, arc or polygon. The combination of the two files means that there is a spatial and a descriptive record for each point, arc or polygon created. The attribute table can also be connected to external databases by means of a second identifier.

As has been discussed earlier, the descriptive data was entered into a dBASE IV database and the fields were grouped according to location, architectural characteristics and historic context. An individual cob identification number was allocated to each separate cob building. This database was then imported and loaded into the established ArcView project file.

To connect or join the attribute tables of the spatial datasets to the descriptive database, illustrated in Table 4.1, the identifying field used was the individual cob identification number. By linking the database to the spatial datasets a range of analysis was made possible by using the Query command for the combined attribute tables.

The joining of the descriptive and the spatial data allows queries to be made regarding any fields in the database: fields relating to the location, architectural characteristics or historical data. The cob buildings that are identifed by the query are then highlighted on the database and also highlighted on the combined spatial dataset. Labels can be attached to the selected buildings or other required features. Examples of this can be seen in Figures 4.15, 5.2, 5.4 and 5.5. The descriptive data can also be accessed directly from the spatial dataset by highlighting any of the buildings shown.

This integration of spatial and descriptive datasets allows for complex interrogation and analysis to be undertaken of possible and potential relationships between the location, architectural characteristics and historic contexts of the cob buildings and their topographical contexts.

<u>Incorporation of the Scanned Data</u>

Historic and current photographs, drawings, plans and photocopies relating to the study area were scanned, using a flatbed scanner, and transferred into Adobe Photoshop 5.0, where the images were improved where necessary. The scanned graphic and cartographic data was then imported into the ArcView project from Adobe Photoshop 5.0 and stored as View documents.

The historic material was photographed or photocopied, with permission, from original sources held in the County Record Offices. This material includes a series of photographs of the tithe map of the study area that illustrates buildings and important geographical features, including roads, field boundaries, woodland and orchards, as they existed in 1839. The tithe apportionment, that was compiled concurrently with the tithe map, supplements this information with details of ownership, tenancy, acreage and use of land. Of particular interest were the eighteenth and nineteenth century estate maps, the First and Second Series Ordnance Survey maps and the surveyor's drawings of Sandford primary school (see case study, Chapter Six). Secondary sources of material include relevant illustrations from publications and articles referring to Sandford. Examples of historic material used are shown in Figure 4.3[5] and in Chapter Six where a series of case studies is discussed and illustrated.

The ability to access and display historic and current photographic, graphic and cartographic material, alongside the descriptive data and the digitised spatial data, allows for comparisons to be made that may provide information about likely changes that have occurred.

The Trial Survey

Prior to the development of the final tabular database and the completion of the digitisation of all the map sheets, a small trial survey was conducted to explore the viability of the proposed recording methodology. An outlying settlement, New Buildings, sited close to a cross roads on the western side of Sandford parish, was chosen for the trial.

Using the methodology described, data relating to the location and to the architectural characteristics of the buildings were collected and photographs of the relevant buildings were taken. The descriptive data were entered into a trial dBASE IV database and integrated with the digitised spatial data from the relevant map sheet. The descriptive and the spatial data were then stored in an ArcView project file. Cartographical archival material relating to the buildings was photographed, scanned and also entered into the project file. Data from the trial database indicated similarities between the pre-twentieth century buildings. For example, they were mostly constructed from cob with thatched* roofs that were half hipped* at one end and gabled* at the other.

[5] Enlargements of these photographs are included in Appendix One
* see Glossary

Evidence from the historic maps showed that the settlement was sited on an earlier coach route that, in the mid-eighteenth century, had become a turnpike or toll road. Comparison between the digitised maps and the tithe map of 1839 revealed the changed importance of the roads at the central junction. Other archival sources indicated that the settlement had originally contained an Inn, a forge and a wheelwrights, all in close proximity to the cross roads. This would have been consistent with the presence of a major coach route.

Figure 4.15[6] shows a particular group of three Listed cob buildings in the trial area. Information stored in the descriptive database identified these as likely to be of pre-nineteenth century origin. According to the database the oldest of the three, Rosebank (a), had originally been a sixteenth century farmhouse, the other two, Ivy Cottage (b) and Howards Cottage (c), were considered to be of eighteenth century origin. When the three cottages were identified on the spatial datasets it was shown that they were sited away from the centre of the settlement. Reference to the relevant part of the scanned and stored tithe map of 1839 (e) showed the three cottages and by accessing the scanned Ordnance Survey map of 1888 it was shown that there had been former wells close to this group of buildings, (f).

A field visit confirmed the presence of one of the remaining well heads (d), in a wall close by Rosebank. Locating these buildings on the digitised maps also showed that they were sited in a relatively exposed position, on sloping ground between 140 metres and 180 metres above sea level.

[6] Enlargements of the photographs and maps are included in Appendix One

Figure 4.15 demonstrates how different types of data can be combined in a display layout to present a visual representation. The photographs were incorporated into the layout from previously scanned and stored data and the relevant section of the digitised map was added. Information from the descriptive database relating to the buildings was highlighted and shown on the digitised map and information regarding the wells added as separate annotations.

Certain alterations were made to the tabular database following this trial. Database fields had been included that required close external or internal examination of the building. This was going to be difficult to accomplish for all the Listed cob buildings in the time available for the project and these fields were deleted and additional fields added to accommodate further architectural and historic data. It would be advantageous to the understanding of historic cob buildings if fields relating to internal architectural details could be added to the tabular database at a future date.

Discussion

The tabular database of the Listed buildings in the study area performs as a catalogue or inventory from which the buildings constructed of cob can be extracted for analysis. It allows for stored tabular data about the location, architectural characteristics and historic context of the Listed cob buildings to be displayed, queried and sorted.

The spatial datasets, or themes, demonstrate the topography of the whole of the study area and the solid and drift geology of part of it. These themes allow analysis to be carried out on the relationships between different geographical and geological variables which may provide information regarding likely settings for settlements and buildings.

With the integration of the tabular database fields and the digitised spatial data a further range of analysis relating the cob buildings to their physical and historic surroundings becomes feasible. From the tabular database the buildings can be located on the digital maps and from the maps the buildings can be identified, displayed and described. Further information relating to the buildings is contained in fields in the tabular database, and in the stored current and historic written, graphic and cartographic material.

By using a GIS a more flexible and comprehensive approach can be taken to recording historic earthen buildings. But, from the point of view of the requirements of the brief for the current project: to develop a methodology that is capable of describing, analysing and characterising earthen buildings in a given area, the majority of the results described above could have been achieved by utilising other desktop mapping software. However, by using a GIS for the storage of the descriptive, spatial and scanned data an opportunity is provided for further analytical options to be explored in the future.

Preliminary trials have been undertaken on certain of these options. One of these is the creation of Digital Elevation Models (DEM's) of the whole of the study area. This possibility is illustrated in Figure 4.16 which shows a DEM of part of the study area.

Using this option would enable the siting of the cob buildings to be visually apparent. Using the Derive Slope facility would permit the slope of the land to be calculated, of use in understanding the siting of the cob buildings.

The ability of a GIS to create buffer zones around buildings has also been explored. A buffer creates a zone of a specified distance around a feature and is used for proximity analysis.

This would be advantageous to understanding the siting of the cob buildings in relation to potential sources of building or repair materials such as the proximity of the geological material, head, to the cob buildings.

From an historic perspective a further useful option to be considered is the use of additional software to underlay the spatial coverages with scanned historic maps of the corresponding area, thus allowing changes in road systems and field boundaries to be understood. This was tried on the area of Newbuildings, the trial study part of the study area. Imagine software, produced by ERDAS, was used to underlay the tithe map of 1839 below the present OS map. The most marked changes noted were in the width of the roads passing through the settlement and in certain of the field boundaries.

Conclusions

The fourth aim of this thesis, stated in the introductory Chapter, was to construct an inventory of cob buildings that could fulfil the requirements of the original remit: to develop a methodology that describes, analyses and characterises earthen buildings in central Devon and allows for their distribution to be related to the geology, geography and building traditions of the area (see Chapter One, pages 7 and 8). This chapter has described such an inventory and has illustrated the development of a methodology that is capable of fulfilling the requirements of the brief.

In the next two chapters, analysis undertaken on the completed descriptive and spatial datasets are discussed and the results considered.

CHAPTER FIVE -EXAMPLES OF ANALYSIS ON THE COLLECTED DESCRIPTIVE AND SPATIAL DATA USING A GEOGRAPHICAL INFORMATION SYSTEM

Introduction

Chapter Four proposed and described a methodology to catalogue and describe cob buildings in a particular study area, Sandford, in mid Devon, a methodology that utilised a GIS for the storage of the descriptive, spatial and scanned data.

This chapter describes a series of analyses carried out on the collected descriptive and spatial data relating to the cob buildings in the study area in order to establish the value of the recording methodology and to explain how the proposed methodology can fulfil the requirements of the original remit. The following chapter demonstrates the use of the methodology for specific cob buildings in the study area.

The objectives of this chapter are as follows:

1. To demonstrate that the proposed methodology, described in Chapter Four, is an effective method for inventorying and characterising cob buildings.
2. To demonstrate that a GIS can provide an effective tool for the analysis of disparate data relating to cob buildings.

The series of analyses described utilises the collected and integrated data to explore relationships between the individual cob buildings, their history and their topographical and geological surroundings. The results of the analysis are illustrated by the use of histograms, tables and figures and supported by graphic, cartographic and photographic evidence.

Series of General Analysis

The analyses undertaken are grouped in four series following the format used for describing the data in the previous chapter, and using the same column head reference letters as in Table 4.1[1].

Series 1. Analysis of the numbers of Listed* buildings in the study area and the identification and location of the Listed cob buildings, Fields A to I inclusive (see Table 4.1).

Series 2. Analysis of the architectural characteristics of the Listed cob buildings, Fields J to AK inclusive (see Table 4.1). As this is a large series it will be subdivided into two sub series, Fields J to R and Fields S – AK.

Series 3. Analysis of the historic context of the Listed cob buildings, Fields AL to AS inclusive (see Table 4.1).

Series 4. Analysis of the relationships between the Listed cob buildings and the surrounding topography and geology. Illustrated by Figures 5.1, 5.2, 5.4 to 5.12 inclusive.

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[1] Examples from Table 4.1 are on pages 135-140. The complete Table 4.1 is shown in Appendix Three
* see Glossary

Series 1: Analysis of Identification and Location Data, Fields A - I

The importance of including data fields that identify individual buildings in a study area is emphasised by English Heritage in the Monuments and Information Data Standard (MIDAS) manual (RCHME 1998b). Essential units of reference suggested in the manual are incorporated in the tabular database fields A-I (Table 4.1). These include identification numbers or codes for the individual Listed* buildings, map references, and postal and location information relating to the buildings and to the study area. The objective in analysing this data group was to gather information relating to the quantity and distribution of all the Listed structures throughout the study area.

Histogram 5.1 shows the current number of Listed structures in Sandford parish and illustrates that eighty six, or 76%, of these are constructed of cob. Histogram 5.1 also shows that the number of cob houses or cottages that are Listed is considerably greater than the number of farm or outbuildings. The low numbers of Listed cob farm or outbuildings is likely to be a result of English Heritage's earlier policy of not listing such buildings unless particularly outstanding or part of the curtilage of a Listed farmhouse (Cherry 1996a).

The results show the distribution pattern of the Listed cob buildings with forty (46%) contained within settlements while forty-six (53%) are located in farmsteads or are isolated buildings. When the descriptive data is depicted integrated with the spatial data the distribution pattern can be seen and understood, as illustrated in Figure 5.1. This distribution pattern complies with the theories of Hoskins (1954) and Darby (1973) which are discussed in Chapter Two (pages 38 and 40).

* see Glossary

Two settlements, New Buildings and East Village (formerly East Sandford) are shown in Figure 5.1 to be sited on previously important routes. New Buildings originated as a result of the growing importance of the turnpike* or toll road that passed through the settlement and East Village is sited on a previously important route that lead from the parish to other nearby parishes and then to the market town of Tiverton. The later reduction in importance of these two settlements conforms to Robert's theory that settlement patterns may vary over time (see Roberts (1987) in Chapter Two, page 41).

Series 2: Analysis of Architectural Characteristics Data, Fields J - AK

The data relating to the architectural characteristics of the Listed buildings was entered into twenty eight separate database fields (Table 4.1 Fields J - AK).

As previously discussed these fields have been subdivided into two separate groups:

2.a Data relating to general characteristics, Fields J - R

2.b Data relating to constructional characteristics and architectural details, Fields S – AK

Series 2a: Analysis of General Characteristics Data, Fields J - R

In this group of fields the data that have been considered relate to external characteristics of the Listed cob buildings including the Listed Grade*, aspect, number of storeys, type and usage and the estimated date of original construction and later alterations.

* see Glossary

Nine database fields, J to R, describe the general characteristics of the Listed cob buildings:

- The Listed* category or Grade* awarded by English Heritage.
- The aspect or orientation.
- The number of storeys.
- The original and current types and usage.
- The estimated original date of construction.
- The estimated date of additional construction work.

- Listed buildings by Grade*

106 buildings in the study area are Listed as Grade II, 5 are Listed as Grade II* and one, the church, is Grade I. Of these Listed buildings eighty six are constructed of cob. Histogram 5.2 shows the Grades of all the Listed buildings in the study area and demonstrates that eighty two of the cob buildings are Grade II and four are Grade II*. The high percentage of cob buildings, in comparison to the numbers of Listed buildings constructed of stone or rubblestone, may reflect the lack of suitable stone building material in the area or may demonstrate that cob was the material of preference, particularly for lower status buildings (Child 1994: 6-7). Of the five buildings in the Study Area awarded Grade II* status, four are identified as being made from cob and one from rubblestone.

- Aspect of the buildings

Histogram 5.3 demonstrates that where the aspect of the Listed cob buildings in the study area has been identified in the List description the majority are shown to face south or south-east. The results of the analysis of the aspect of the Listed cob buildings show that,

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* see Glossary

throughout the study area, the majority of the cob buildings identified as domestic dwellings face south or south-east. This finding corresponds with views on the aspect of historic buildings by authors reviewed in Chapter Two (see Hoskins (1954), page 38 and Roberts (1987), page 41). Of the Listed* cob agricultural buildings identified, four face south or south-east. Comparison of the aspect of the Listed cob buildings with their original date of construction shows that a higher proportion of the sixteenth and seventeenth century Listed cob buildings face south, rather than south-east, while the reverse was noted in the eighteenth and nineteenth century, where the majority of the Listed cob buildings face south-east.

- Number of Storeys

73 buildings are described as two storeys

8 are described as one storey.

Although there is evidence of surviving cob buildings of three storeys in neighbouring parishes the majority of the Listed cob buildings in the parish of Sandford, the study area, were of two storeys. All but one of the one storey cob buildings are agricultural buildings or outbuildings. The exception is the primary school.

- The Type of Buildings

Histogram 5.4 shows the Listed cob buildings by original type. From this table it will be seen that the majority of the Listed cob buildings are dwellings and are mostly described as farmhouses or cottages.

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* see Glossary

- Use of Buildings

Histogram 5.5 shows the original use of the Listed cob buildings, where this has been identified. Similarly to the data relating to original type shown in the previous table, the majority of the Listed cob buildings are domestic.

The data describing the type and use of the Listed cob buildings divides the buildings into their original and their current state. It was to be expected that the majority of the Listed cob buildings in the study area would have originally been for domestic use (Histogram 5.4 and Histogram 5.5). In comparison to the number of domestic buildings recorded the number of cob agricultural or domestic outbuildings identified is low. As mentioned on page 162, this may reflect the philosophy of English Heritage's earlier Listing system as much as the likelihood of domestic buildings surviving in comparison to agricultural buildings (Cherry 1996a). Concern has been voiced that it is agricultural cob buildings that are most at risk from being demolished (Keefe and Child 2000: 38).

- Original date of Construction

Histogram 5.6 shows the Listed cob buildings in the study area and their probable original date of construction. This demonstrates that the majority of the cob buildings in the study area are likely to have been built during the sixteenth, seventeenth and eighteenth centuries. The numbers of buildings constructed during these centuries is paralleled by the use of cob as the major building material. This increase in building may be attributable to the growth of population in the study area at this period and the buoyant economic situation due to the thriving woollen trade (see Hoskins (1954) in Chapter Two, page 39). Roberts (1987: 215) also considers that factors such as wealth and status, affect the frequency of building and rebuilding in an area. By the nineteenth century stone building materials were in equal use to cob. Hoskins (1954) and Morriss (2000) suggest improved

transport systems permitted the movement of building materials, including stone, with greater ease than previously (see Chapter Two, page 39).

- Estimated date of additional construction

76 Listed cob buildings have undergone alterations, predominantly in the nineteenth and twentieth centuries. Most additional construction or partial re-building of the cob buildings was carried out in the nineteenth and twentieth centuries when 88% of the Listed cob buildings underwent alterations.

Series 2b: Analysis of Constructional Characteristics and Architectural Details, Fields S - AK

Constructional Characteristics

Analysis was undertaken on data in Fields S – AK in order to gain a better understanding of the use of cob as a constructional material in the study area. This data allows for correlations between the cob walls and the covering, design and structure of the associated roofs to be explored and the relationships between the constructional characteristics and original plan forms to be considered. The accuracy of the data available for each individual building is necessarily limited by the information contained in the List of Buildings of Special Architectural or Historic Interest, as it is this information that has been used as the core data for the project (see Chapter Four, page 129). The buildings where internal information has not been recorded must, therefore, be considered from the external information that is available.

Eleven database fields describe the constructional characteristics and plan forms of Listed cob buildings and include the following:

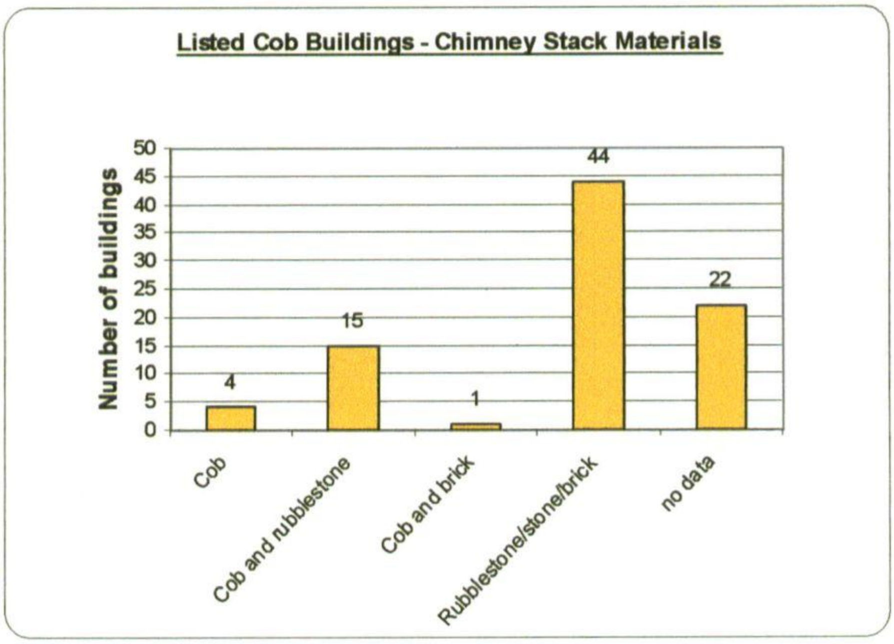
- Cob as a walling material.
- Cob as a chimney stack material.
- Roof materials, roof shape and roof structure.
- Original plan forms.
- Chimney stack position.
- Cross wings.

- <u>Cob as a walling material</u>

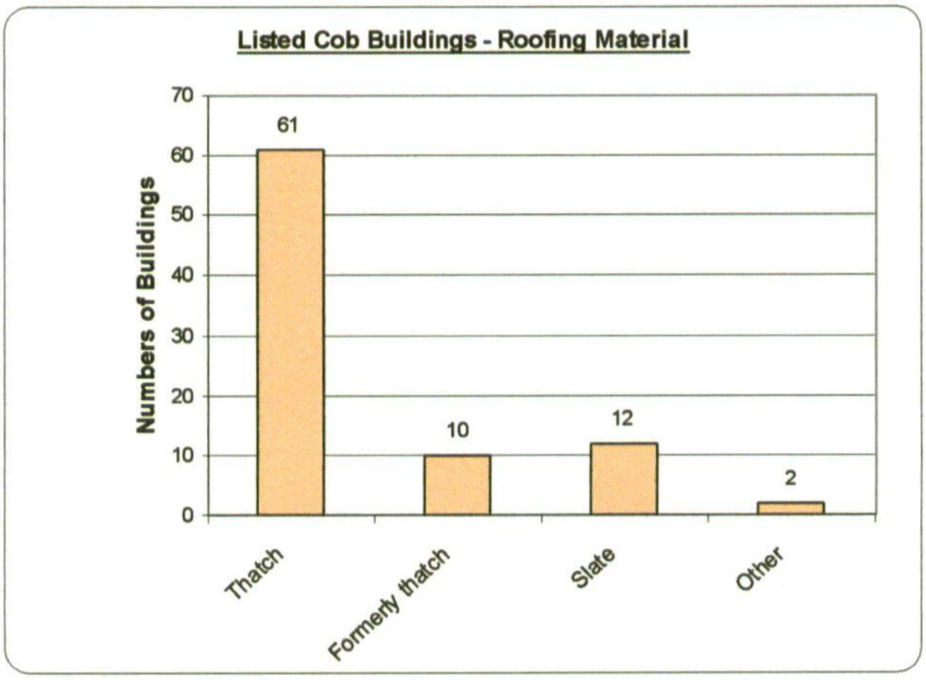
86 Listed buildings in the study area are described as being constructed with cob walling material. Histogram 5.4 has shown the different types of buildings for which cob was used. Histogram 5.5 has demonstrated that the majority of the buildings were for domestic use. Histogram 5.6 has shown that cob was the most commonly used building material in the sixteenth, seventeenth and eighteenth centuries. The fact that, within the study area, cob was used as the building material for approximately 80% of domestic buildings in the sixteenth, seventeenth and eighteenth centuries demonstrates the ubiquitous use of the material for a range of building types and confirms the observations on the use of cob in mid Devon by the agricultural surveyors of the late eighteenth and early nineteenth century (see Marshall (1796), and Vancouver (1808), Chapter Two, page 21).

- <u>Cob as a chimney stack material</u>.

Histogram 5.7 illustrates the numbers of chimney stacks identified as being totally or partially constructed with cob in comparison to those constructed of other materials. From this histogram it is seen that a high proportion of the Listed cob buildings have the chimney stack material identified, but that very few of these have stacks made entirely of cob. Marshall (1796) referred to the use of cob for chimney stacks and Histogram 5.7 shows that a small number of stacks remain that are entirely of cob and that a larger



Histogram 5.7



Histogram 5.8

proportion of chimneys are partially built of the material. A seventeenth century cob fireplace and chimney is identified in a building, previously used as a blacksmiths, in the centre of Sandford and an eighteenth century cob stack has been confirmed on another former blacksmiths at Stones Hill (see case study on The Old Forge in Chapter Six).

- Roof materials, shape and structure

Histogram 5.8 compares the numbers of Listed cob buildings in the study area that are, or were previously, thatched* with those that have slate or other roof coverings. The numbers of Listed cob buildings that are thatched, or were previously thatched indicate that thatch* is the preferred roofing material for cob buildings within the study area. Historically, wheat straw, locally termed wheat reed, was the most commonly used material although local slate was also used (Keefe and Child 2000: 35).

Histogram 5.9 demonstrates the numbers of Listed cob buildings that have gable ended* roofs in comparison to those where the roof shape is identified as being wholly or partially hipped*. Keefe and Child (2000: 36) suggest that where thatching* is used as the roofing material the roof shape is likely to be fully hipped* or half hipped*. The results shown in Histogram 5.9, however, show that the numbers of roofs that were fully hipped*, half hipped* or had a combination of hips with gables* was not significantly greater than the gable ended roofs. The relatively high number of gable roofs may be due to the numbers of Listed cob buildings that have been re-roofed at some stage. Linking original date of construction to roof shape did not show any significant results.

* see Glossary

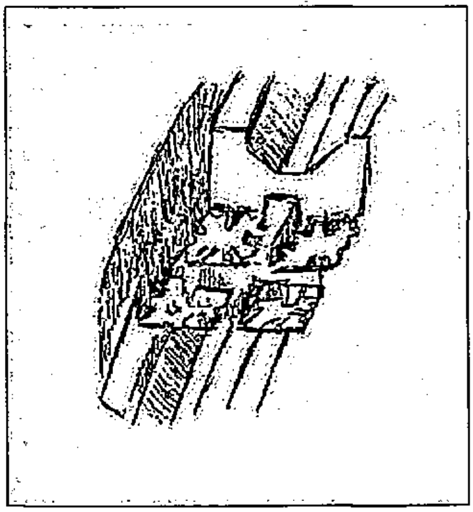
Histogram 5.10 shows roof structures identified in the Listed cob buildings and includes those that are smoke blackened*. This implies that these buildings were originally of open hall plan*, the smoke from the open central hearth causing the blackened roof timbers.

Roof structures and their surviving methods of joinery are important indicators of age, survival and significance. The results of the analysis of the data relating to different roof structures, shown in Histogram 5.10, show that twelve cob buildings in the area have side pegged* jointed cruck* roofs, which are considered to be an earlier form of construction than A-frames* (Keefe and Child 2000: 35). Seven of the twelve jointed cruck* roofs identified also show signs of smoke blackening*. The location of the identified cob buildings with jointed cruck* roofs is shown in Figure 5.2. Those buildings that have jointed cruck* roofs that are also smoke blackened* are shown in grey whereas yellow is used to indicate buildings that have jointed cruck* roofs that are not smoke blackened*.

The cob buildings with jointed cruck roof construction range in size from two bays* to twelve and date from the fifteenth or sixteenth centuries. Of particular note are the side pegged jointed crucks* found in both Prowse Farmhouse and Bremridge. In both houses these have chamfered* arch bracing* and also have carved bosses* at the apex of the crucks*. One of these bosses is illustrated in Figure 5.3, together with examples of decorative moulding found in both houses. It is likely that other significant cob buildings of this date would have originally had jointed cruck* roofs, but that these buildings have been re-roofed and A-frames* have been used.

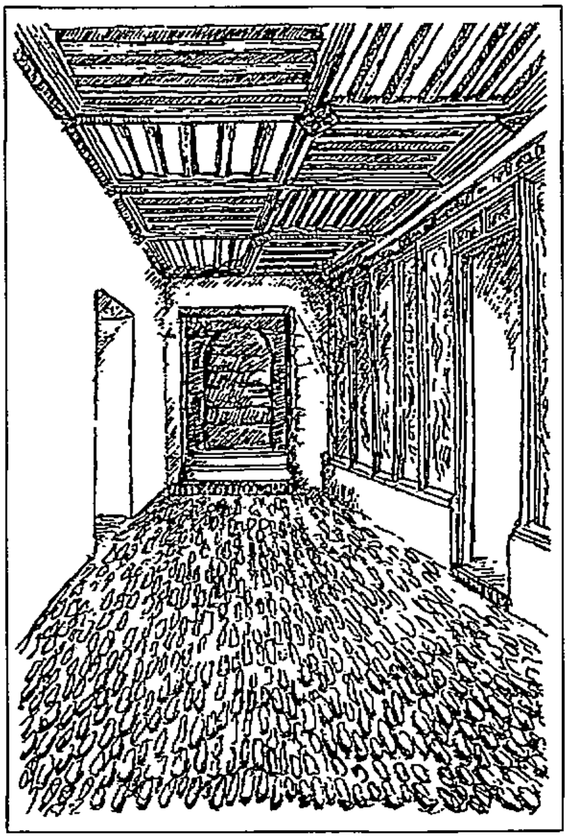
Only thirty one roof structures of the eighty six Listed cob buildings were inspected at the time of Listing, which represents 36% of all the Listed cob buildings. It is therefore

* see Glossary

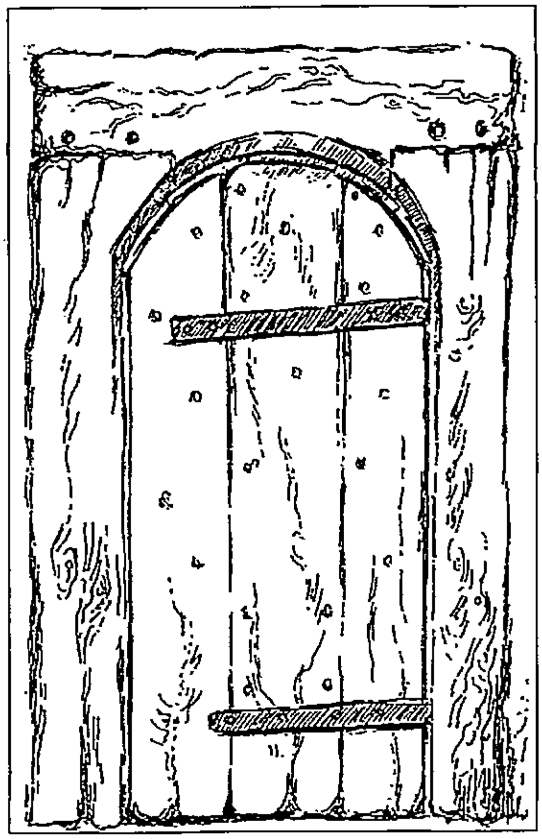


Bremridge - carved boss

Bremridge - chamfered, panelled door



Prowse - decorative panelled ceiling



Prowse - round headed doorway

Figure 5.3 shows decorative mouldings in two sixteenth century cob buildings

Drawings by C. Hulland (1980 and 1984)

probable that other jointed cruck* roofs exist in the study area, but have not been identified. Only four of the Listed descriptions include the type of purlins* used. These four are all butt purlins* and associated with jointed cruck* structures.

A frames* with pegged lap joints* are the next in progression after the jointed crucks*. Most of those that were recorded date from the seventeenth century, but there are a few from the sixteenth century. This complies with the findings of Keefe and Child (2000: 35) who consider that A-frames* replaced jointed cruck* roof structures in the seventeenth and eighteenth centuries.

A further Listed building that contains jointed crucks* is Dowrich House, which is Listed as being of stone construction, but has been identified, by the current owners, as retaining cob walling in the earlier parts of the building (Lee 1999). Dowrich has a massive sixteenth century chimney stack and it is thought likely that it was ceiled* from the outset and that there was no original open hall* (see case study on Dowrich House in Chapter Six).

When roof structures were compared with roof shapes no definite association was revealed, although in buildings with known jointed cruck* roof structures there was a tendency towards hipped or half hipped* roof shapes.

- <u>Number of Roof Bays*</u>

Twelve of the Listed cob buildings have the number of roof bays* recorded. The number of bays ranged from two to twelve and were identified in buildings of the sixteenth or

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* see Glossary

seventeenth centuries. The number of bays* created indicates the original size and prestige of a building and may also be related to age. Earlier cob buildings show a tendency to contain smaller and more numerous bays*, which may have been due to lack of confidence in the strength of the construction (Perkins 1999).

- Original Plan Forms

Histogram 5.11 shows that the original plan forms are described in seventy seven (89%) of the Listed cob buildings. This allowed for comprehensive analysis to be undertaken of this important architectural characteristic. The data relating to original type and current type showed that some former farmhouses have been divided into smaller units and that the reverse has also taken place with previous cottages combined into one dwelling. A variety of plan forms is described, from one-roomed cottages and two or three-room cross-passage* farmhouses to substantial two roomed double depth* houses, such as the seventeenth century Park House, and the nineteenth century Star House.

The Listed cob buildings in the study area mainly date from the seventeenth, eighteenth and nineteenth centuries. Those with two-room cross-passage plans* are of seventeenth and eighteenth century construction. Twenty one cob buildings were identified as originally of three-room cross-passage* plan. The data relating to original use shows that the majority of these were farmhouses. All the earliest identified cob buildings in the study area contain this plan form, which would indicate that the three-room cross-passage* plan form was most commonly used in the fifteenth, sixteenth and early seventeenth century. Seven of the cob buildings with this original plan form also have jointed cruck beams* and a further four have A-frame* roof structures with pegged lapjoints*. The results confirm the findings of

* see Glossary

other authors including Hulland (1980: 127), Brunskill (1988: 111) and Barley (1967: 748), who consider that, until the eighteenth century, the typical larger and medium sized house plan for the region consists of a hall, cross-passage* and lower rooms.

- <u>Chimney Stack Position</u>

Histogram 5.12 illustrates the distribution of axial* and lateral* stack types for forty six of the Listed cob buildings. These are identified as solitary stacks or in combination with others and are compared to the probable original date of the building. When the occurrence of axial* stacks was compared to the original plan form it was found that, with the exception of one three-room lobby-entrance*, these were recorded on cob buildings with three-room cross-passage* plan forms and dated from the sixteenth and seventeenth centuries.

- <u>Cross Wings*</u>

Four cross wings* are identified. One each from fifteenth and sixteenth century Listed cob buildings, one on a sixteenth century farmhouse and one on a nineteenth century inn. Only higher status buildings are recorded as having cross wings*. These include a fifteenth century example at Prowse and a probable sixteenth century example at Ruxford Barton. Both were originally Manor Houses and although Ruxford is Listed as being constructed of rubblestone, significant amounts of cob walling to the rear of the building have been identified by the owners (Reed 1999). Cross wings* are considered rare in Devon at farmhouse level (Hulland 1984), which would indicate that these buildings were of high status.

* see Glossary

Architectural Details

Although the volume of data recorded for the architectural details database fields is limited, the results achieved from the analysis are useful for identifying conformity. Architectural details can indicate the status, development and earlier ownership of the Listed cob buildings.

Nine database fields describe architectural details, including the types of doors and doorways, windows, floors, stairs, mouldings and plasterwork. The amount of information included in the Lists for these fields is limited and the complex and varied way in which the items have been described does not allow for the formation of histograms.

- Doors and doorways

Twenty two of the Listed cob buildings have details of doors and doorcases included in the Listed descriptions. These describe a range of door types including examples of studded oak doors of fifteenth and seventeenth century origin, sixteenth century plank doors* and eighteenth and nineteenth century panelled* and plank doors*. Moulded, chamfered* and decorated doorframes are also described. As would be expected, the oak studded doors are found in the earlier higher status houses with the smaller and less important farmhouses and cottages retaining panel* and plank doors*. Changing fashion in the eighteenth and nineteenth centuries is demonstrated by the inclusion of multi-panel* doors with or without lights* over. Decorative doorframes are recorded that include frames that have stopped* chamfers* of various designs. By the nineteenth century elaborate panelled* doorcases are described on several buildings including Sandford Ash and Woolsgrove (see case study of Woolsgrove in Chapter Six)

*see Glossary

- Window Types

The majority of the Listed cob buildings have details of the window type recorded. Most are of nineteenth and twentieth century sash* or casement* design with occasional surviving examples from the sixteenth, seventeenth and eighteenth centuries described. Many have had windows changed and replaced, particularly in the nineteenth and twentieth centuries. A few early mullioned* windows survive including occasional examples of small oak mullioned* stair lights with ovolo* moulding and original leaded glass (see case study of Dowrich House in Chaper Six). The development from the earlier mullioned* window to the later casement* and sash* windows is evident, with several examples of many paned sash windows dating to the nineteenth and early twentieth centuries.

- Floor Types

Only two floor coverings are identified, both of these refer to flagged or stone floors. Considering the number of farmhouses that are included in the List, it is likely that there are others that have not been identified.

- Stair Types

Eleven stairways are identified by type. These include examples of sixteenth century turret* stairs, fifteenth and sixteenth century stair blocks* and sixteenth century winder* stairs. One seventeenth century dog leg* staircase is identified and three later nineteenth century central staircases. The interesting surviving stair types are the turret stairs at Whiterose and Lower Bagborough Cottages and the stair blocks at Bremridge and Combe Lancey. All four buildings are of fifteenth and sixteenth century origins but the turret constructions are likely to have been added in the seventeenth century during a period of

* see Glossary

rebuilding (see case study of Combe Lancey in Chapter Six). The appearance of this type of round or square stair wing at the rear of contemporary cob buildings is commented on by Barley (1967: 749). Three winder* stairs are included, in buildings of sixteenth century origin. These are at Higher Furzeland, Hynams and The Chantry. The central staircases at Park House, Sutton and North Creedy are associated with a higher status of domestic dwelling and would, therefore, be expected in these three later date or refurbished buildings.

- Moulding and Beams

In the study area a range of moulding types have survived. These include thirty one examples of moulded and decorated axial* and cross beams, ten examples of moulded and decorated plank and muntin* screens, wainscotting* and carved decorative ceilings.

The survival of architectural internal decorative mouldings on doorframes, ceilings, partitions and doors provides information about the status, reconstruction and development of historic buildings. Hoskins (1954) refers to the wave of rebuilding that took place in Devon between the middle of the sixteenth century and the middle of the seventeenth century when, in his opinion, farmhouses and small higher status buildings were enlarged and reconstructed from previous hall houses (see Hoskins (1954) in Chapter Two, page 39). These refurbished buildings were sometimes decorated with carved partitions, wainscotting* and elaborately carved ceilings.

Examples of ogee* and ovolo* mouldings are described on the partitions, staircases, doorcases and ceiling beams of earlier cob buildings throughout the study area. Two particularly decorative carved ceilings are described at Prowse and Bremridge. There are

* see Glossary

marked similarities between the intersecting panelled* beamed ceilings with carved bosses* found in both buildings. These two buildings have been fully described by Hulland (1980 and 1984). Figure 5.3 shows illustrations of internal decorative moulding at Prowse and Bremridge (Hulland 1980 and 1984).

The study area contains a number of plank and muntin* screens. Ten are identified in the Listed building descriptions of which two, at Prowse and Whiterose, have surviving traces of original sixteenth century painting. It is likely that more plank and muntin* screens are present in cob buildings that have not been internally inspected.

A variety of cross and axial* beams are mentioned in the Listed descriptions. These are chamfered* and decorated at the extremities of the beams with a variety of stops*. The designs of the stops* may be used to help identify age. For example, Brunskill (1988: 140-141) has described a variety of combinations from basic fifteenth and sixteenth century chamfer* and run out stops* to more elaborate seventeenth century carved and decorated stops*. The numbers of beams described and the variety of decorative moulding on them demonstrate the status of the cob buildings (An example of chamfered stopped beam ends is shown in the case study on Frogmire in Chapter Six).

- Plasterwork

Ornamental plasterwork is identified in five Listed cob buildings. Detailed descriptions are given of two particular examples of early seventeenth century decorative plasterwork. Dira Farmhouse is described as containing late seventeenth or early eighteenth century moulded plasterwork friezes* in the parlour and the chamber above. These are described as including angels and Tudor roses. Ruxford Barton has high quality plasterwork, also in the

* see Glossary

first floor of the parlour wing. In this case there is a moulded strapwork* cartouche* with central achievement* and the initials of Edward and Anne Chichester, the estate owners of Ruxford, which is dated 1608. The later emergence of eighteenth century estates and the growing knowledge of design are likely to have influenced the mouldings and plasterwork found in the higher status houses built or refurbished at this date. Examples of early nineteenth century plasterwork are referred to in three houses including Park House. (A case study of Park House is included in Chapter Six).

<u>**Series 3: Analysis of Historic Context Data, Fields AL - AS**</u>

The unadorned facts abstracted from the analysis of the documentary data do not portray the wealth of information discovered by examining archival material relating to the study area. The documentary material describes a millennium of evolution that has occurred within the parish of Sandford, from the tenth century Saxon Charters, which outline boundaries and mention existing settlements, to the comprehensive descriptions of the ownership and tenancy of properties and the extent and use of land that is to be found in the tithe maps and apportionments of the mid nineteenth century. In between these dates certain key documents are found that illustrate aspects of the study area at specific dates.

The data in these eight database fields refers to known sources of documentary evidence that can help identify the historic origins of buildings in the study area. The data are not confined to Listed cob buildings, but include all buildings for which documentary evidence has been found and that are included in this work. Some of the evidence acquired from these sources is stored in scanned written and graphical form, examples of which are illustrated in the previous chapter in Figure 4.3.

* see Glossary

The sources of data used include:

- Buildings recorded in the Devon Sites and Monuments Register (SMR).
- Buildings for which there are dated documentary references.
- Buildings for which there is evidence of former ecclesiastical ownership.
- Buildings that are included in the Norden map of 1598.
- Buildings that are included on other dated historic maps.
- Evidence of ownership of buildings taken from the tithe apportionment of 1839.
- Evidence of acreage attached to buildings taken from tithe map of 1839.
- References to buildings in *The Place Names of Devon* (Gover et al. 1932).

- Buildings recorded in the Devon Sites and Monuments Register

All the Listed buildings in the study area are in the Devon Sites and Monuments Register, (SMR). Some non Listed buildings and all known historic building sites and archaeological sites are included in the SMR. Histogram 5.13 shows types of archaeological sites included in the Register, exclusive of the Listed buildings and Figure 5.4 illustrates the location of these sites in relation to the Listed buildings within the study area.

Evidence from the SMR shows that prehistoric artefacts, including an axe head, a spindlewheel and a dress ornament, have been found at different sites in the study area. This demonstrates the likelihood of early occupation of existing farmstead sites. Hoskins (1954) considered that the area was likely to have been settled since at least the Saxon era; the archaeological sites seem to confirm this (see Chapter Two, page 38).

The sites include prehistoric enclosures, linear features, windmill sites and crop marks. Ancient boundary features from the Saxon charters are recorded, as are the known fords and bridges. Two Saxon houses are included in the SMR, Swannaton and Downhayne, and

four medieval houses. These are Prowse and Dowrich, both manor houses, West Pidsley and Dodderidge.

The register is of particular interest to this project as the sites recorded help in the understanding of early settlement patterns of the area. This is demonstrated when the archaeological sites, shown in purple on Figure 5.4, are compared to the location of the earliest Listed cob buildings, those with jointed cruck* roof structures, which are shown in Figure 5.2. (The roof structures that retain signs of smoke blackening* are shown in grey).

Two Chapels of Ease* are also included in the Devon SMR. These are at Ash Bullayne, formerly Esse Boleyn, and Ruxford Barton. The presence of chapels in a private house, usually indicates a building of high former status such as a manor house (Reichel 1922: 272).

The Sites and Monuments Register includes post medieval and modern sites including the site of a mansion and historic gardens that belonged to the Davie estate and the site of former toll houses erected on the turnpike*, or toll, roads within the parish.

In Chapter Two, the opinions of Hooke and Kain (1982), Brayshay (1996), Hoskins (1972) and other authors, are discussed (see Chapter Two, page 50). Their belief that it is necessary to use historical material to understand the rural landscape would seem to be endorsed by the evidence found in the Devon SMR in relation to the study area.

* see Glossary

- Dated documentary references to specific buildings

Dated sources of documentary references were included in order to establish origins of existing or earlier buildings on specific sites. Histogram 5.14 shows the sources of reference and the numbers of sites of buildings involved. Histogram 5.15 shows the sites by the century of the recorded reference.

The Domesday Book* for the Exeter area, compiled following the Norman conquest, documents the ownership, occupancy and use of land holdings in 1087. Three sites in the study area are mentioned. Two of these, Combe Lancey and Ruxford have existing buildings on the sites, the former Listed as of fifteenth century origin and the latter of sixteenth. The third site mentioned is Dodderidge. The building on this site is Listed as likely to have sixteenth century origins. The three sites are shown on Figure 5.5.

Although no documentation was found specific to the study area from the twelfth century, documentation for a further twenty three sites was found dating from the thirteenth, fourteenth and fifteenth centuries. This illustrates the growth of settlements in the medieval period. Eleven of the current buildings on these sites are not Listed.

The buildings shown in Figure 5.5 include those that are documented in the Saxon Charters, which are highlighted in blue, those that are included in the Domesday Book, shown in green and those that were formerly prebendary farms shown in pink. The majority of these buildings are also included in other documents and historic maps. Buildings for which there is documentary evidence prior to the nineteenth century (other than in the Saxon Charters, Domesday Book or prebendary records) are shown in yellow.

* see Glossary

Some of the earlier buildings, when compared to Figure 5.4, are shown to be sited near to archaeological sites including Combe Lancey, Ruxford Barton and Dowrich House (see Chapter Six for case studies on these buildings).

As well as the Saxon sites included in the Devon SMR further sites are mentioned by Rose-Troup (1942) who describes a relevant Saxon charter of 930AD (see Chapter Four, page 111). Current farmsteads exist on four of the sites described: Swannaton, Downhayne, West Pidsley and Henstill. The location of the four sites is shown on Figure 5.5. The Saxon boundary of the parish is outlined by a series of landmarks including farms, bridges and fords.

- <u>Evidence of former ecclesiastical ownership</u>

Included in the documented early buildings or sites of buildings above are eight former prebendary farms* that were in the ownership of the Crediton Collegiate church and for which there are detailed records from 1333 until the Dissolution of the Monasteries Act in 1536 (see Chapter Four, pages 112-114).

Originally eight prebendary* farms were within the present study area. The whereabouts of all are known and seven have existing buildings on the site. Three of these, Woolsgrove, Henstill and Rudge are Listed buildings. The four further buildings, Aller, Cross and Creedy (now Long Barn) and West Sandford are not Listed (see case studies on Woolsgrove, Aller and Cross in Chapter Six). Records for these landholdings span two hundred years, from 1333 until the Dissolution of the Monasteries in 1538. The sites of seven of the eight prebendary* farms are shown, in pink, on Figure 5.5.

* see Glossary

The eighth site, the prebendary farm* of Carswill or Kerswell, is considered by Munday (1985: 67) to be the present site of Creedy Park. The name, Kerswell, is currently used for a nineteenth century cob estate cottage.

- Evidence of inclusion in the sixteenth century Norden parish terrier

In 1598 a parish terrier was compiled by Norden. The original map was destroyed in a fire (Rose-Troup 1942: 237), but a nineteenth century copy shows twenty four named buildings in the study area. All of these sites can be identified and are occupied by existing buildings. These include five of the prebendary* farms mentioned above.

- Evidence of inclusion on historic maps

In addition to the sixteenth century Norden terrier further historic maps indicate the sites of buildings in the study area. These include:

Estate maps and plans from the sixteenth, seventeenth, eighteenth and nineteenth centuries.
John Ogilby's coaching map of 1675.
John Dunn's map of 1765.
The First Series Ordnance Survey map of 1809.
The Second Series Ordnance Survey map of 1909.

Further documentary evidence has identified buildings in existence in the sixteenth century, seventeenth century and eighteenth century. These include buildings shown on the plans and maps of specific estates including those of the Chichesters at Ruxford and the

* see Glossary

Davies at Creedy Park, the largest estate in the study area. A selection of photographs of this cartographic evidence is shown in Figure 4.3, in Chapter Four.

The plans and maps identify not only the buildings and their siting but also illustrate changes and additions to farmhouses, surrounding farmbuildings and field boundaries. In addition to the estate maps and plans, general maps of the study area provide further evidence of the existence of particular buildings at known dates. These maps include Ogilby's coaching route map of the seventeenth century, Dunn's early nineteenth century map of Devon and the first and second series Ordnance Survey maps of the area, which span the same century.

- Evidence from the tithe apportionment of 1839

The tithe apportionment of 1839 contains the names of ninety six separate farmhouses or cottages together with the name of the owner and of the tenant. The number of acres attributed to each property indicates its size and status.

- Evidence from the tithe map of 1839

The tithe map of 1839 shows buildings, rivers, roads, fields, orchards, and woodlands. Each enclosure is identified with a number that corresponds to the tithe apportionment.

The tithe map and apportionment for the study area provides a detailed synchronic image of the ownership, tenancy, use and extent of property in the parish of Sandford in the middle of the nineteenth century. Examples of parts of the tithe map are shown in Appendix One. The apportionment gives details of the owner, the tenant if applicable, the extent of each individual enclosure within the holding and the use of the land at the date of assessment. A map, with the distances measured in chains, accompanies the associated apportionment. (One chain = approximately twenty metres). The 1839 tithe map of the study area, Sandford, is in excellent condition and of high quality. Ninety six separate farmhouses, houses and cottages are listed together with the acreage and tithe or tax to be paid by each property. An estimation is given in the apportionment of amounts of arable land, grassland, and orchards (see Appendix Two). Domestic buildings are shown on the tithe map coloured in pink whilst agricultural or other outbuildings are shown in grey. This colour differentiation allows for changes in use to be recognised and assists in the identification of nineteenth and twentieth century alterations to the buildings.

- References in *The Place Names of Devon* gazetteer, Gover et al. (1932).

To allow for further analysis of historic documentary material, a database field was included to indicate sources of reference material, related to the study area, that have been identified by Gover et al. (1932). The earliest references are from the tenth century and the later ones from the seventeenth century

Series 4: Analysis of the relationships between the Listed cob buildings and the surrounding topography and geology.

The advantages to be gained from integrating the descriptive and the spatial datasets in order to identify the location of specific cob buildings have been illustrated in Figures 4.15, 5.1, 5.2, 5.4 and 5.5.

The final series of analysis explores the potential of using a GIS to examine further possible relationships between cob buildings and the surrounding landscape. As has been discussed in Chapter Two and Chapter Four, cob buildings are likely to have been sited with regard to the slope, orientation and productivity of the land, the proximity of water sources and communication systems, and the availability of suitable building materials.

Evidence of this is likely to be demonstrated in relationships between the siting of the cob buildings and the contours, water systems, road systems, field boundaries and geology of the study area.

To verify whether or not such relationships are evident in the study area and whether they can be demonstrated, all of the Listed cob buildings have been considered in relation to the following topographical variables:

- Contours
- Water Systems
- Road Systems
- Field Boundaries
- Geology

- <u>Contours</u>

Figure 5.6 illustrates the use of the integrated descriptive and spatial datasets to demonstrate the siting of the cob buildings that are described in the List as having been constructed prior to 1800 (Table 5.1). From information contained in the Listed descriptions it has been shown that the cob buildings in the study area predominantly face south or south-east, and that the majority of those with origins in the fifteenth and sixteenth centuries tend to face south while later buildings tend to face south-east (Histogram 5.3). Figure 5.6 shows that the pre 1800 Listed cob buildings are sited on rising slopes with the exception of those on the valley floors, or in the centre of settlements.

Name of Building	Original Type	Original Date	Plan Form	Roof Structure	Stack Type	Aspect	Mouldings
Combe Lancey	Farmhouse	C15	3 room, cross	Jointed Cruck	axial, lateral	southwest	Yes
Dowrich Kitchen	House	C15	1 room	Jointed Cruck		southeast	Yes
Prowse Farmhouse	Manor House	C15	3 room, cross	Jointed Cruck	lateral	south	Yes
Bremridge	Farmhouse	C16	3 room, cross	Jointed Cruck	lateral	southwest	Yes
Dodderidge	Farmhouse	C16	3 room		lateral	southwest	
Gaters	Farmhouse and barn	C16	T shape	Jointed Cruck	axial, lateral	south	Yes
Higher Furzeland Farmhouse	Farmhouse	C16	3 room, cross	A frame, collar	lateral	southeast	Yes
Hynams	Farmhouse	C16	3 room	Common rafter	lateral	east	Yes
Ivy Cottage	House	C16	3 room, lobby		end	south	
Little Combe Lancey	Farmhouse	C16	3 room, cross		axial	west	Yes
Lower Bagborough Cottages	Farmhouse	C16	3 room, cross		axial	southeast	Yes
Nos 128 & 129 The Shute	House	C16	3 room, cross		lateral	south	Yes
Rosebank	Farmhouse	C16	3 room,cross		lateral	southeast	
Rudge House	Cottages	C16	3 room, cross		lateral	east	
Ruxford Barton	Manor House	C16	3 room, cross	A frame, collar	axial, lateral	south	Yes
Sandford Ash	Farmhouse	C16	3 room, cross	A frame, collar	axial	southeast	Yes
Sturridge	Farmhouse	C16	3 room, cross		lateral	south	
Sutton Farmhouse	Farmhouse	C16	4 room	Kingpost	lateral	south	Yes
Swannaton Farmhouse	Farmhouse	C16	3 room, cross	Jointed Cruck	lateral	south	Yes
The Chantry	Cottages	C16	3 room, cross	Jointed Cruck		south	Yes
West Henstill House	Farmhouse	C16	3 room, cross		lateral	southeast	Yes
Whiterose	Farmhouse	C16	3 room, cross	Jointed Cruck	axial	south	Yes
Woolsgrove Farmhouse	Farmhouse	C16	3 room,cross	Jointed Cruck	end	southeast	Yes
Bussells	Farmhouse and barn	C17	2 room	A frame, collar		southwest	Yes
Land Farmhouse	Farmhouse	C17	2 room, lobby	A frame	axial	south	Yes
Lillybrook Cottage	Farmhouse	C17	3 room, cross	A frame	end	south	Yes
Middle Henstill	Farmhouse	C17	3 room, cross	A frame, collar	axial	south	Yes
Northlakes	Farmhouse	C17	3 room, cross		axial	south	Yes
Oaklands 1 & 2	Cottages	C17	2 room	A frame		south	Yes
Park House	House	C17	2 room, double			south	Yes
The Old Smithy	House and forge	C17	2 room, cross		end	northeast	Yes
Wayside Cottage	House	C17	2 room, cross	A frame, collar	lateral	south	Yes
Yarmleigh Farmhouse	Farmhouse	C17	3 room, cross		lateral	southeast	Yes
North Creedy	Farmhouse	C18	2 room, double		end	southeast	

Table 5.1 shows Listed Cob Buildings Constructed Prior to 1800

An individual example is shown in Figure 5.7. which demonstrates the siting of Ruxford Barton, a sixteenth century former manor house on a Domesday* site (see case study, Chapter Six). The descriptive data has identified that the building faces south, the contours indicate that it is sited on a gentle slope. Figure 5.7 also demonstrates the advantage of using the digitised data to create a digital elevation model visually to illustrate these factors.

- Water systems

The proximity of a water source is also considered to be an essential element in the siting of buildings (see Roberts (1987) Chapter Two, page 41, and Hoskins (1954) Chapter Two, page 38). The relationship between a water source and specific buildings in the trial survey has been described in Chapter Four (page 154). Figure 5.6 illustrates the use of the integrated descriptive and spatial datasets to show the proximity of the cob buildings to water sources. Figure 5.8 shows two individual examples: Woolsgrove, a former prebendary farm that is Listed as late sixteenth century, and Higher Furzeland, a sixteenth century farmhouse, Listed Grade II*. Both are sited adjacent to water sources.

- Road Systems

The significance of the proximity of historic routes to Listed cob buildings was also illustrated in the trial survey where it was found that certain of the buildings in New Buildings had been developed as a result of the turnpike* or toll road (see Chapter Four, page 154 and Figure 4.15). A similar relationship is seen in Figure 5.9 which shows Listed cob buildings in East Village, in the north-east part of the study area. Here the pattern of the existing roads is similar to the routes shown on the tithe map of 1839. As has been mentioned earlier this was formerly the major route from Sandford to the neigbouring

* see Glossary

village of Cheriton Fitzpaine and the market town of Tiverton. Close to the road are Prowse (previously named Lower Dodderidge), considered to be of fifteenth century origin and Dodderidge, of sixteenth century origin with the site mentioned in the Domesday Book*. The Chantry is Listed as early sixteenth century and may have originally been in the ownership of the Plympton Priory (Munday 1985: 5).

- Field Boundaries

The importance of field boundaries as a means of identifying early settlements has been discussed in Chapter Two. Taylor (1975) and Rackham (1986) have both identified the importance of relict* hedges and small, irregular fields as a means of locating the sites of former or early farmsteads (see Chapter Two, pages 42 and 45). The digitised spatial dataset of the field boundaries allows the relationship between the Listed cob buildings and their surrounding fields to be examined. Field boundaries shown on earlier maps, including the tithe map and estate maps, demonstrate the number of orchards present in the early nineteenth century. This assists in the identification of ancillary cob buildings within the farmstead such as former apple lofts and pound* houses. Figure 5.10 shows the field systems around Hynams and Swannaton and also the orchards close to Mooracre. From this figure it can be seen that the first two farmhouses mentioned are surrounded by small, irregularly shaped fields with several larger fields in the area between the two farms. Hynams, in particular, retains several very small enclosures close to the farmstead, a pattern that indicates a likely early farm site (see Taylor (1975) Chapter Two, page 42).

The value of consulting and comparing historic cartographic material was illustrated by the discovery that the apparently early field systems around Dowrich Outbuilding, a fifteenth

* see Glossary

century cob building that is considered to be a former farmhouse, proved to be of nineteenth century origin when compared to the tithe map of 1839. In the digitised map, shown in Figure 5.11, three small irregular fields are shown to the north-west of Dowrich. When these are compared with the pattern shown in the lower illustration, taken from the tithe map of 1839, it can be seen that these fields are not part of an earlier field system but were created after the tithe map was drawn and are on the site of a former orchard.

- Geology

The final topographical variable to consider, in relation to the Listed cob buildings in the study area, is the underlying solid and drift geology. The proximity of the geological materials, head, alluvium and river terrace deposits may be of importance in the identification of earlier cob buildings as these materials, particularly head, are likely to be suitable for the construction of cob (see Scrivener (1997) and Edwards and Scrivener (1999) Chapter Four, page 121).

The solid and drift geology for one section of the study area was digitised into the programme. This allowed the sites of existing Listed cob buildings, in this section, to be determined in relation to nearby sources of constructional material. Figure 5.12 shows fourteen Listed cob buildings, all considered to be former farmhouses. The buildings are sited within proximity of suitable constructional material, particularly to the material, head.

All the buildings demonstrated in Figure 5.12 are constructed prior to 1800, with eight identified as likely to have been built prior to 1700. (North Creedy is Listed as being of eighteenth century origin but architectural and documentary evidence indicates that it is probably of earlier construction). At the time of the construction of these cob buildings the customary means of transport for building materials was restricted to a primitive sledge,

locally termed a "truckamuck" (Hoskins 1954: 150). This would necessitate using materials that were close to the proposed site of the building.

The relationship between the earlier cob buildings and the probable source of building material may be the most important result to have been obtained from the analysis of the topographical variables. It is important for the survival of these historic buildings as these same sources are capable of providing suitable material for the repair of damaged cob walls.

The above descriptions of analysis undertaken on selected Listed cob buildings and the topography and geology of the study area show that the cob buildings are likely to have been sited with regard to certain factors. These factors are the slope and orientation of the land, the nearness of water and road systems and the proximity of suitable soil for constructing cob walls. The results of the analysis of relationships between Listed cob buildings and the selected topographical items is considered particularly important in order to understand and identify sites that are likely to have been occupied for the longest time.

Discussion

As has been discussed previously, it was decided to utilise the List of buildings of special architectural or historic interest, prepared by English Heritage, to provide a core data source of known provenance and integrity (see Chapter Four, page 129). This source of data proved to be valuable where buildings had been inspected internally as well as externally, but less informative where internal inspection had not been possible. Any bias that occurred in the analysis as a result of incomplete data collection has been commented on throughout the chapter.

Where complete or near complete data were available comprehensive analysis was possible. This is illustrated in the assessment of certain factors including the location, aspect, date of original construction and original plan forms of the Listed cob buildings. Other data, including important factors such as descriptions of roof structures, were found to be limited and less extensive analysis was possible. Table 5.2 demonstrates the variation in the amount of data included in the Listed descriptions relating to the Listed cob buildings in the study area.

Results that were obtained from this data are summarised in Table 5.3. The results indicate that the location of many of the earlier cob buildings are in or near the peripheral settlements rather than the main village. The majority of the earlier Listed cob buildings are farmhouses and face south or south-east. The prevalence of thatch[*] is demonstrated and the fact that there are smoke blackened[*] jointed cruck[*] roof structures retained in existing cob buildings, indicates the existence of earlier open halls[*]. It is apparent that earlier cob buildings tended to have three-room cross-passage[*] plan forms and the numbers of lateral[*] and axial[*] stacks described suggest there may be unidentified former open hall[*] houses in the parish. The presence of elaborate carpentry, moulding and plasterwork indicates that there were several higher status buildings in the study area, including Prowse, Bremridge, Whiterose, Ruxford and Higher Furzeland, to name but five.

[*] see Glossary

Item	Total number of Listed cob Buildings	Description	Number	Percentage of all Cob Buildings
Location	86	In settlements	40	47%
		Isolated	46	53%
Aspect	79	Face south or southeast	52	65%
Type	86	Farmhouses	31	36%
		Cottages	28	33%
		Houses	9	10%
		Farm buildings	11	13%
		Other	7	8%
Use	84	Domestic	68	79%
Original construction date	86	Pre 1900	74	86%
		C15	3	4%
		C16	24	28%
		C17	27	31%
		C18	20	23%
Roof covering	85	Thatched or previously thatched	71	84%
Roof shape	68	Fully or half hipped	38	59%
		Gabled	28	41%
Roof structure	31	Jointed cruck	12	39%
		A framed (12 with pegged joints)	16	52%
Plan forms	77	2 room	23	30%
		3 room cross passage	21	27%
Stack positions	58	Axial	16	28%
		Lateral	33	57%

Table 5.2 Shows Variable Amounts of Data Included in Listed Descriptions

	C15	C16	C17	C18	C19
Total Listed	3	24	27	20	12
Located in Settlement	1 x E.Village	3 x E.Village	1 x Aller Down	1 x Aller Down	1 x Aller Down
		1 x New Buildings	5 x E.Village	2 x E. Village	1 x Creedy Park
		4 x Sandford	3 x New Buildings	3 x New Buildings	3 x New Buildings
		1 x Spicers	4 x Sandford	1 x Spicers	1 x Spicers
			1 x West Sandford	1 x Stone Hill	4 x Sandford
				3 x Sandford	
Aspect	2 x south	11 x south	11 x south	6 x south	3 x south
	1 x southeast	2 x southeast	5 x southeast	9 x southeast	9 x southeast
Original Type	1 x farmhouse	15 x farmhouses	11 x farmhouses	4 x farmhouses	1 x house
	0 x cottages	2 x cottages	5 x cottages	15 x cottages	8 x cottages
	1 x house	6 x houses	5 x houses	0 x houses	1 x inn
	0 x farmbuildings	3 x farmbuildings	6 x farmbuildings	2 x farmbuildings	1 x school
	1 x other	1 x other	0 x other	0 x other	1x other
Original Use	2 x DM	20 x DM	19 x DM	18 x DM	9 x DM
	1 x AL	0 x AL	1 x AL	0 x AL	1 x AL
	0 x AG	3 x AG	6 x AG	1 x AG	
			1 DM/AG	1 DM/AG	
Roof Covering	2 x thatch	11 x thatch	20 x thatch	18 x thatch	10 thatch
	1 x slate	6 x previously thatch	4 x previously thatch	2 x slate	2 x slate
		5 x slate	2 x slate		
Roof Shape	2 x hipped/gable	8 x hipped/half/gable	11 x hipped/half/gable	13 x hipped/half/gable	5 x hipped/half/gable
	1 x gable	10 x gable	9 x gable	4 x gable	3 x gable
Roof Structure	3 x jointed cruck	9 x jointed cruck	0 x jointed cruck	1 x other	1 x other
		3 x A frame	11 x A frame		
		2 x other	2 x other		
Plan Forms	1 x 1 room	3 x 2 room	10 x 2 room	4 x 1 room	4 x 1 room
	2 x 3 room, cross	17 x 3 room, cross	4 x 3 room, cross	13 x 2 room	15 x 2 room
		1 x T	1 x 3 room		1 x 3 room
		1 x central stair			1 x 4 room
		1 x 3 room, lobby			
Stack Positions	1 x axial	6 x axial	5 x axial	2 x axial	2 x axial
	2 x lateral	11 x laterial	8 x lateral	6 x lateral	4 x lateral
		12 x end	11 x end	12 x end	6 x end

Table 5.3 Summary of Characteristics of Listed Cob Buildings in Study Area by Century

From the results of the analysis of the descriptive data comparisons can be made between Listed cob buildings of the same original date and estimations can be carried out as to the progression of changes in characteristics. Common characteristics have been identified relating the cob buildings to the century of origin given in the Listed descriptitons. Table 5.3 summarises these characteristics and more detailed written descriptions, classified by the century of origin, are given in Appendix Four.

The analysis of the documentary data provides information about the probable age and origins of some of the buildings in the parish. This historic evidence may be of particular value in indicating buildings where there may be earlier fabric concealed (see case studies on Frogmire and Doggetsbeer in Chapter Six).

In summary, the examination and analysis of the empirical evidence in the descriptive database has extended existing knowledge regarding the Listed cob buildings in the study area and has allowed for correlations to be made between probable age, architectural characteristics and historic context.

However, analysis of the descriptive data alone does not permit comprehension of the sites and location of the cob buildings nor of the potential influence of topographical factors on their construction and survival. By locating the cob buildings on a map and relating the descriptive data to the topography and geology of the study area, further complex and extensive analysis becomes possible.

The first example of this is in Figure 5.1 which shows the location of the Listed buildings in the parish. From this figure it is apparent that there is a compact group of buildings in the main settlement, Sandford village, that includes Listed cob buildings and a similar compact but smaller group in the settlement at New Buildings. A scattered but still distinct group is present in East Village (formerly East Sandford), and smaller groups of buildings are found in West Sandford, Stones Hill, Spicers and Aller Down.

Farmstead groups are also identified, including Higher and Lower Furzeland and Higher and Lower Woolsgrove (Figure 5.8). The farms tend to be sited close to the routes into and out of the parish including the toll road on the west of the parish, the south to north route across the parish and the north-eastern route leading towards Tiverton. These are all ancient routes that are mentioned in the Anglo Saxon Charters of the tenth century (Rose-Troup 1942: 241).

A second example of the value of analysing the integrated data is seen in the relationship between existing buildings and archaeological sites. The sites, shown in Figure 5.4, confirm the probability that the early settlement pattern of the study area did not focus on the village of Sandford. By comparing the archaeological sites in Figure 5.4 with the documented sites shown in Figure 5.5 it is seen that there is a correlation between the siting of earlier cob buildings and the prehistoric sites. This concurs with the work described by Aston (1985: 29) who suggests that present settlements may be sited close to earlier sites. A group of farmstead sites to the west of the parish, including Ash Bullayne, Bagborough and the Furzelands are close to recorded prehistoric sites and in the area around the Domesday manor of Ruxford and the prebendary farm of West Sandford two fords, an ancient boundary mark and a chapel are sited. There is also a group of similarly ancient sites around Combe Lancey and Creedy Park in the south of the parish, including the Watching Seat or lookout, mentioned in the Sandford Charter of 930 (Rose-Troup 1942: 240). This is referred to in the case study of Combe Lancey in Chapter Six.

The ability to locate the sites of Listed cob buildings that contain particular constructional characteristics is demonstrated in Figure 5.2, which shows the geographical location of buildings that still retain jointed cruck* roof structures.

More detailed analysis has been achieved by positioning selected cob buildings onto the digitised maps and analysing the location of these buildings in relation to the topography of the study area. The results demonstrate that the sites of the majority of the earlier cob buildings are on sloping land within the proximity of a water source (Figure 5.6, 5.7 and Figure 5.8). The cob buildings are also shown to be close to existing road systems (Figure 5.1 and Figure 5.9).

The relationship between the buildings and field boundary patterns proved less conclusive. Rackham (1986) and Taylor (1975) consider that small and irregular field boundaries may indicate the sites of earlier buildings (see Chapter Two, pages 42 and 45). The integrated data showed that a proportion of the earlier cob buildings were sited close to small irregular fields (Figure 5.10), but evidence from the tithe map shows that, in some instances, these had been created from larger fields in the later nineteenth or twentieth centuries (Figure 5.11). However, the field boundaries were of value in identifying previous land use, including the existence of orchards, and the sites of farmsteads that no longer exist, but have documentary proof of their earlier existence. The tithe maps of 1839 show a landscape with fewer and larger field boundaries than that of the current Ordnance Survey 1:10,000 maps.

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* see Glossary

The ability to include scanned graphic and cartographic material proved valuable in illustrating architectural features relating to the cob buildings and in demonstrating changes in the landscape of the study area. This has been demonstrated in Figure 5.3 and Figures 5.10 and 5.11.

In summary, the results of the analysis of the Listed cob buildings in relation to the selected topographical items are considered important in order to understand and identify sites that are likely to have been occupied for the longest time.

Conclusions

The objectives of the thesis, as stated in Chapter One, were based on a triangular concept: that to develop a systematic methodology for inventorying earthen buildings it is necessary to consider relationships that may exist between the architectural elements, topographical factors and historic aspects that relate to the buildings.

The stated objectives of this chapter were to demonstrate that the proposed methodology, described in Chapter Four, would provide an effective method for inventorying and characterising the cob buildings in the study area and to show that a GIS would provide an effective tool for the analysis of the disparate data relating to the buildings.

At the conclusion of the analysis it has become apparent that the recording methodology proposed, based on the triangular concept, is capable of performing as a powerful and extensive tool, a tool that is capable of inventorying and characterising the cob buildings in the study area and also, by utilising the GIS program, for investigating relationshsips between the developed descriptive and spatial data sets, relating to the buildings, that were described in Chapter Four.

In the next chapter the methodology is used to describe specific Listed cob buildings in the study area. The ability of the methodology to provide a means of describing and analysing specific historic cob buildings is explored as well as the potential of the methodology to predict the likely whereabouts of previously unrecorded, but possibly significant, surviving cob buildings.

CHAPTER SIX - APPLICATION OF THE RECORDING METHODOLOGY TO TWELVE CASE STUDIES

Introduction

The primary objective of the previous chapter was to show that the proposed methodology was capable of fulfilling the requirements of the original brief: to create an effective tool for inventorying and characterising earthen buildings in a given area. The secondary objective was to demonstrate the advantages of using a GIS to analyse the differing data that had been collected in relation to the cob buildings within that area.

The results of the analysis, described in Chapter Five, demonstrate that the developed methodology is capable of cataloguing and characterising cob buildings in a given area, and can also demonstrate relationships between the cob buildings and their surroundings.

In Chapter Five, a generic approach was taken involving all the Listed* cob buildings in the study area. This chapter takes a specific approach, demonstrating the further use of the methodology for a series of individual case studies on selected cob buildings. A series of twelve case studies is presented in two parts. Each case study contains the results of field visits to the buildings made by the author, ably assisted by Judith Morse.

Part One consists of eight case studies that illustrate the ability of the methodology to utilise the collected and stored descriptive and spatial data to provide comprehensive descriptions of particular Listed cob buildings.

* see Glossary

English Heritage's List of buildings of architectural and historic interest for the parish of Sandford (1985) directed the original selection of cob buildings for this study, but archival searching found that there were other buildings in the study area that might be of equal historic interest to those included in the Lists. In Part Two, four further case studies describe non Listed cob buildings and show the potential of the methodology as a predictive tool for identifying cob buildings that have features that are of interest, but which have not previously been identified or recorded.

Part I: Case Studies of Listed Cob Building

The field visits and case studies on the eight Listed buildings show how the developed methodology can be used to enhance knowledge and understanding of buildings already identified as of architectural or historic interest. The sample buildings were selected to illustrate representations of different ages, types, uses, plan forms and historical associations and are considered in relation to their location, architectural characteristics, known history and topographical situation.

The buildings include a small house that was previously a cottage attached to a forge, a former farmhouse now divided into two dwellings, a current farmhouse, a former prebendary farm, two former manor houses, a large village house and the present primary school. All are Listed as Grade II buildings. The case studies are divided into six sections, including an introduction and a report of the field study. Single pages of examples of representative and relevant cartographic and graphic material illustrate each case study. The examples are small and are intended to demonstrate the advantages of using a GIS for collating and depicting diverse material. To allow for closer scrutiny of the material, enlargements of the photographs are included in Appendix One. These are indicated in the footnotes.

Case Study One: The Old Forge

Introduction

The Old Forge, illustrated in Figure 6.1[1], is a small cob building, typical of many in the study area. Historic cartographic material has revealed that this building has features of interest additional to those noted in the Listed description.

Location

The map, shown in Figure 6.1a, shows that the building is sited close to a crossroads in the hamlet of Stones Hill. This, like the siting of the forge in New Buildings, (see page 154) indicates that the building was positioned close to a well used and important route. The crossroads is formed by the junction of two main routes from Sandford to the neighbouring parish of Kennerleigh. The small group of buildings on this crossroads are all constructed of cob and two of the other buildings are also Listed Grade II.

Architectural Characteristics, from Listed Description (English Heritage 1985)

The building is considered to be of eighteenth century origin, built of cob with a plaster rendering. The cottage faces east and has a two-room floor plan. The Listed description suggests that the left part of the building was formerly the dwelling and that the right part was used as a forge.

Historic References

The Old Forge is shown on both the First Series Ordnance Survey map of 1809 and the tithe map of 1839 (Figure 6.1b and 6.1c[2]). The latter map shows that the forge was situated in the left part of the building and not the right, as specified in the Listed description. The colourings used on the tithe map indicate this: the forge is represented in grey and the cottage in pink, as was normal practice for the tithe maps for this part of Devon.

[1] Enlargement of photograph is included in Appendix One, Figure 4.2c
[2] Enlargements of photographs are included in Appendix One, Figures 6.1b and 6.1c

Topographical Siting

The cob buildings in the hamlet face south or east, and are sited on sloping ground close to a source of water and to a major communication route.

Field Visit

A field visit to The Old Forge confirmed the siting of the building close to the crossroads. Evidence was found within the building that the forge had been in the left part of the building and not the right. The fireplace in the right part is on the gable wall and contains a bread oven indicating domestic use. On inspection, the large chimney stack serving this fireplace, seen in Figure 6.1d[3], proved to be constructed of cob and not of rubblestone as suggested in the Listed description. The former forge fireplace was sited on the lateral wall at the back of the building. This demonstrates how reference to available historic maps may provide more accurate information on the previous use of a building.

Case Study Two: Gaters

Introduction

Gaters is a former farmhouse with an extended barn to the rear of the building, as shown in Figure 6.2[4].

Location

The building is sited at the western end of the village on the route to the settlements of West Sandford and New Buildings. It is also close to a road junction leading north-west from the village centre.

Architectural Characteristics, from Listed Description (English Heritage 1985)

The description states that the former farmhouse has been converted into two houses, but that the large cob barn at the rear of the building has not been altered.

[3] Enlargement of photograph is included in Appendix One, Figure 6.1d
[4] Enlargement of photograph is included in Appendix One, Figure 4.2d

The two storey main building is considered to be of possible sixteenth century origin and is constructed of cob with a plaster render. It has been altered in later centuries and finally divided into two in the late twentieth century. The roof is hipped* with a covering of wheat reed thatch* and the original floor plan consisted of a four-room main block facing south with the barn at right angles to the house. The barn has a central door opening onto a former threshing floor*.

Historic References

Gaters is shown on the tithe map of 1839 (Figure 6.2b[5]). At this date the land extended to sixty acres and the farm was occupied by a tenant but owned by a Reverend Rufus Hutton. It was not in the ownership of one of the large local estates.

Topographical Siting

The topographical siting of Gaters conforms to the pattern seen in other early farmhouses in the study area. It is south facing, on a slope, close to a water source and near a major route. Geologically it is shown that there is an accessible source of head material to the rear of the farmhouse (Figure 6.2a).

Field Visit

A field visit to Gaters showed that the southern end of the large barn had been converted to create additional accommodation for the house. The original plan form of the house is likely to have been a three-room cross-passage plan* with an axial stack* inserted in the cross-passage at a later date. The roof structure is of jointed crucks*, placed relatively close together and creating ten bays* between 1.5 metres and 3.2 metres in width. The feet of the crucks* are visible in the upstairs passageway. The plinth* height ranges from 0.75 metres to 1.25 metres. As stated in the Listed description the axial beams* are plain with no stops* but there is moulding on the door architraves*. The barn also has jointed

* see Glossary

[5] Enlargement of photograph is included in Appendix One, Figure 6.2b

cruck* beams, yoked* at the apex, with butt purlins*, some surviving windbracing* and a half hipped* wheat reed thatched* roof which was originally of eight bays* (Figures 6.2d and 6.2e[6]). It is possible that this barn was originally used as a tithe barn, for the collection of tithes paid in kind, which would explain the size of the barn in comparison with the farmhouse (Perkins 1999). The ownership of Gaters by a member of the clergy may also be significant. The tithe map of 1839 (Figure 6.2b[7]) shows there were further outbuildings, opposite the barn, that have since been removed. Outside the main house there is a circle of cobbles on the ground, which the owners of Gaters believe is the base of a previous ash house, similar to that at Combe Lancey. Gaters has been divided into two cottages but the layout of the building is still apparent. The long barn to the rear of the house is unaltered and the whole building still shows evidence of its former use as a farmhouse. The original size of the barn and the ecclesiastical ownership may indicate that this was indeed a tithe barn.

Case Study Three: Combe Lancey

Introduction

Combe Lancey farmhouse is one of only three Listed buildings in the study area that are considered to have fifteenth century origins. This building is important as a surviving example of an early cob building with a well documented history and is shown in Figure 6.3[8].

* see Glossary
[6] Enlargements of photographs are included in Appendix One, Figure 6.2d and 6.2e
[7] Enlargement of photograph is included in Appendix One, Figure 6.2b
[8] Enlargement of photograph is included in Appendix One, Figure 4.2a

Location

The farmhouse is sited on the southern boundary of the parish close to the previous Crediton to Barnstaple turnpike or toll road.

Architectural Characteristics, from Listed Description (English Heritage 1985)

Combe Lancey is described as containing a surviving fifteenth century core with nineteenth and twentieth century alterations. The building is of cob construction with a rubblestone plinth* and a thatched* roof. The farmhouse faces south and was originally of three-room cross-passage plan* with an axial stack* at the upper end of the former open hall*. The roof is described as mostly of eighteenth and nineteenth century origin but with one sixteenth century smoke blackened* jointed cruck*. The only historic reference given in the Listed description is that the building was formerly a Domesday Estate.

Historic References

In fact, Combe Lancey has an interesting and well documented history from the tenth century onwards. It is close to a Saxon boundary which crossed the present parish of Sandford in a north to south direction. In a paper on the Sandford Charter of 930 there is a reference to a Watching Seat (Weardset), or lookout point, in the south of Sandford parish from which a path ran to Combe Lancey (Rose-Troup 1942: 241). A prehistoric linear feature is also sited near to the present building. These archaeological sites are close to the southern boundary of the parish and are shown on Figure 6.3a. According to the Devon SMR Combe Lancey is mentioned as a manor in the Domesday Book. It is recorded, as Comb, in 1285 in the Feudal Aids when Jocelin de Lancel held the manor. It is mentioned in the Calendar of Inquisitions Post Mortem of 1301 as Combe Lanceles and again in the Feudal Aids of 1303 as Comb Lancelys (Gover, Mawer and Stenton 1932).

* see Glossary

The Manor of Combe Lancey is mentioned in a lease of 1629 by which time the holding had come into the ownership of the Davie family and remained as part of the Creedy Estate until the middle of the twentieth century. The tithe apportionment of 1839 lists a substantial holding of 191 acres owned by Sir Humphrey Davie. The corresponding tithe map shows that the majority of the land was used for arable purposes, with more than three acres dedicated to orchards, and that the original entrance to the farmstead has been altered. The former approach was from the east whereas it is now approached from the north (Figure 6.3d[9]).

Topographical Location

The topographical and geological siting of Combe Lancey is important as an illustration of a site that has survived and remained in use for a considerable length of time. The spatial datasets show that the building is on south facing, sloping ground, close to water sources and ancient road systems. The building is on a site that has an underlying solid geology of Creedy Park sandstone and is in close proximity to the geological material, head. The soils surrounding the farmhouse are fertile and well drained and there is a pond situated to the west of the farmstead that is sited on Head. This pond may be the source of building material for Combe Lancey (Figure 6.3a).

Field Visit

The farmhouse and the integral and surrounding farmbuildings are constructed in cob. The house is sited facing south in a slightly elevated but well sheltered position. The roof is thatched* with wheat reed and the walls are limewashed*. By comparing the present farmbuildings with the tithe map of 1839 (Figure 6.3d[9]) it is apparent that these have been reduced in number and there is no longer a courtyard of buildings.

[9] Enlargement of photograph is included in Appendix One, Figure 6.3d
* see Glossary

Inspection of the roof space in the farmhouse showed a series of roof structures, including the sixteenth century smoke blackened jointed cruck* mentioned in the Listed description (Figure 6.3b[10]). Closer inspection showed that there is more than one smoke blackened jointed cruck*. The feet of the crucks were visible in the long passageway on the first floor (Figure 6.3c[11]). Similar cruck feet were also noted at Gaters (see Case Study Two above). A small iron framed window with leaded lights, which originally lit a stairwell, is now enclosed by later additions to the building (Figure 6.3e[12]). Externally a cob garden wall, which was undergoing restoration at the time of the field visit, illustrates the typical construction of such walls in the study area. Rubblestone is used to create a plinth* of one metre in height, which is topped by one or more lifts of cob material, protected from water penetration by a capping (Figure 6.3f[13]). In this case the capping is in tiles, but the wall would have probably originally been thatched with wheat reed. A cob and thatch circular building has been recently reconstructed on the cobbled area of the former ruined ash house*.

Although altered Combe Lancey still demonstrates original features. In size, plan form, roof structure and topographical position the building resembles Gaters, the former farmhouse in the previous case study. The size and position of the circular ash house site is also very similar to that seen at Gaters. The historic documentary evidence illustrates the importance of this building and its site. The building has been occupied for five centuries, and the site is likely to have been in use for seven centuries.

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* see Glossary
[10] Enlargement of photograph is included in Appendix One, Figure 6.3b
[11] Enlargement of photograph is included in Appendix One, Figure 6.3c
[12] Enlargement of photograph is included in Appendix One, Figure 6.3e
[13] Enlargement of photograph is included in Appendix One, Figure 6.3f

Case Study Four: Woolsgrove Farmhouse

Introduction

Woolsgrove farmhouse and farmbuildings and Higher Woolsgrove form an interesting group of cob buildings. They are considered to be of sixteenth and seventeenth century origin (English Heritage 1985), and formed one of the prebendary* farms belonging to the collegiate church of Crediton prior to the dissolution of the monasteries in 1539.

Location

The group of cob buildings is sited at the head of valley, facing south-east, close to the western boundary of the parish and within one mile of the settlement of New Buildings.

Architectural Characteristics, from Listed Description (English Heritage 1985)

Higher Woolsgrove is described as being constructed of cob on a rubble plinth*, facing south-west and to have originally been built to a three-room and cross-passage* plan. Few earlier architectural details remain as the building was extensively altered in the nineteenth and twentieth centuries. However, the site, plan form and surviving projecting lateral chimney stack* are evidence of its earlier existence. Woolsgrove farmhouse, previously Lower Woolsgrove, and shown in Figure 6.4[14], is considered to be of similar date to Higher Woolsgrove and was also considerably altered in the mid nineteenth century. It is described as constructed of cob on a rubblestone plinth*, facing south-east and of three-room cross-passage* plan. There is a projecting lateral stack* to the rear of the hall constructed of volcanic stone block with a castellated* top (Figure 6.4b[15]). The seven bay* roof contains side pegged jointed cruck* trusses several of which have cambered* collars. The adjoining outbuildings of Woolsgrove farmhouse are also Listed as well as a separate barn 150 metres south-east of the main group (Figure 6.4a).

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* see Glossary

[14] Enlargement of photograph is included in Appendix One, Figure 4.2f

[15] Enlargement of photograph is included in Appendix One, Figure 6.4b

The outbuildings to the rear of the main house are constructed of cob and are considered to date from the seventeenth to the nineteenth centuries. In the seventeenth century range there is a bakehouse* with a massive granite fireplace, a six bay* roof structure of A-frames with pegged lap jointed* collars and a seventeenth century flat arched* door. The separate barn is considered to be of seventeenth century origin and, like all the buildings in the group, is constructed of cob on a rubblestone plinth*. This is a threshing barn* with opposing doors and a central threshing floor*. The central doors have short midstrey* walls and a small porch (Figure 6.4e[16]).

Historic References

The present Woolsgrove is considered to be of sixteenth century origin, but historic references are found from 1281 when the farmstead is mentioned in the Devon Assize Rolls. A mid nineteenth century account of the diocese of Exeter shows that Woolsgrove was a prebendary farm and in 1333 was held by the Precentor, the senior ecclesiastical dignitary, of the collegiate church at Crediton (Oliver 1846). An impression of the value of the property, at this date, is shown in the entries relating to tithes or taxes paid to the church: Woolsgrove comprised one hundred and two acres and was valued at sixteen shillings (see Chapter Four, page 113). This indicates a prestigious and valuable property with a considerable amount of land. By the time of the final dissolution of the monasteries, in 1539, Woolsgrove paid an annual tithe of £2 16s 0d. This was paid in the form of wheat, meat and dairy products, which illustrates the agricultural use of the land in the earlier part of the sixteenth century (see Chapter Four, page 114). The considered value of Woolsgrove at the time of the dissolution, based on the tithes paid, is listed in an inventory of confiscated monastic property, the *Valor Ecclesiasticus*, which was prepared

* see Glossary
[16] Enlargement of photograph is included in Appendix One, Figure 6.4e

for Henry VIII (Oliver 1846). Woolsgrove is also included in the Nordern terrier of 1598 and further documents exist that relate to subsequent owners and tenants from 1642 and 1834 (see Appendix Two). These give information regarding leases, inventories and sales. The layout of the farmstead, in 1839, is illustrated in the tithe map (Figure 6.4c[17]), and the tithe apportionment lists the fields and describes the crops grown or the use of the land at that date.

Topographical Situation

Higher Woolsgrove faces south-west and Woolsgrove farmhouse faces south-east. The complete complex of cob buildings lie on a sloping site between 130 metres and 165 metres above sea level. There is a nearby source of water that is spring fed and leads into a pond between the two original farmhouses, (see Figure 5.8). The roadway that leads northwards to New Buildings passes between the buildings, (Figure 6.4a). The nearest source of head is found below and to the east of the buildings. The likely source of the volcanic material used to construct the plinths of the buildings, and the chimney at the rear of Woolsgrove farmhouse, is at Meadowend, approximately one kilometer from the buildings. Here there is a disused quarry that contains purple-grey lamprophyric lava, a part of the Exeter Volcanic Rocks (see Chapter Four, page 121). This quarry is fully described in the Memoir of the 1:50,000 Geological Sheet 325 (Edwards and Scrivener 1999: 104).

Field Visit

The field visit to Woolsgrove revealed two separate farmhouses and groups of farmbuildings. Higher Woolsgrove has been extensively altered and the farmbuildings are now converted into further dwellings. Woolsgrove farmhouse, the former Lower Woolsgrove, still retains much of its former identity despite nineteenth and twentieth century alterations and additions.

[17] Enlargement of photograph is included in Appendix One, Figure 6.4c

The complex of cob buildings consists of the farmhouse with an integral courtyard of domestic outbuildings on the south-east side of the road and a group of agricultural buildings on the north-west side. The large Listed cob threshing barn* is part of a further group of cob buildings (Figure 6.4a and 6.4e[18]). The original cob farmhouse is concealed behind a mid to late nineteenth century stuccoed* facade with a porticoed* entrance and sash windows*. Within the remodelled interior, however, there are signs of the former building, originally of three-room and cross-passage* plan. In particular the evidence of the surviving jointed cruck* roof structure which, as found in Combe Lancey and Gaters, has the feet of the crucks visible in the upstairs passageway. There is a deep lateral stack* to the rear and the steep pitched roof indicates that the building was formerly thatched. A photograph, taken in the early twentieth century, confirms this (see list of Copeland photos in Appendix Two). The group of relatively unaltered domestic buildings to the rear of the farmhouse also gives an indication of the age and likely former appearance of the original house. These outbuildings are Listed separately and are considered to be of seventeenth century origin. As described in the Listed description, the former bakehouse* contains a granite fireplace that extends the full width of the gable end of the building and the rooms above indicate former domestic use and contain a flat arched* doorway. The carriageway doors that lead into the courtyard have decorative hinges and are thought to be of similar age to the buildings. The group of farmbuildings on the north-west side of the road contain open fronted linhays*, with surviving stone and cob circular pillars, (Figure 6.4d[19]). There is a large cob apple store and probable pound house*, for the production of cider, at the south side of the buildings.

[18] Enlargement of photograph is included in Appendix One, Figure 6.4e
* see Glossary
[19] Enlargement of photograph is included in Appendix One, Figure 6.4d

The tithe map of 1839, shown in Figure 6.4c[20], indicates that there were formerly extensive orchards close to this group of farm buildings and the tithe apportionment identifies the existence of a pound house* for the production of cider. The separate cob threshing barn*, of probable seventeenth century origin, and the adjoining group of partially derelict cob buildings are also interesting. The barn is not rendered and the separate layers, or lifts, of cob used for its construction are clearly displayed (Figure 6.4e[21]).

The entire group of buildings at Woolsgrove is interesting. Its former status as an ecclesiastical prebendary farm, its well documented history and its topographical siting indicate that this substantial farm holding is of importance.

Case Study Five: Ruxford Barton

Introduction

The site of Ruxford Barton is mentioned in Saxon Charters of the tenth century (Rose-Troup 1942: 240, 250) and is recorded as a manor in the Domesday Book* in 1087. Although the existing house is primarily constructed of stone there is evidence to suggest that the main block may have formerly been wholly or partially built of cob.

Location

Ruxford Barton is sited to the west of Sandford village close to the earlier ridge route that links Sandford with West Sandford and New Buildings.

[20] Enlargement of photograph is included in Appendix One, Figure 6.4c
* see Glossary
[21] Enlargement of photograph is included in Appendix One, Figure 6.4e

The front facade of the house is illustrated in Figure 6.5[22]

Architectural Characteristics, from Listed Description (English Heritage 1985)

The building is described as likely to contain a late medieval core, which was refurbished and enlarged in the early seventeenth century and further altered in the late nineteenth century. The present building is described as constructed of volcanic stone and rendered, with a main block and cross wings* at each end. The original plan form is considered to have included a cross-passage* and service rooms and there are existing axial stacks* and a projecting lateral stack* to the rear. The main entrance has an elaborately moulded seventeenth century doorframe with a studded nine panel oak door and there are further ovolo* moulded oak door frames within the building. On the first floor of the parlour wing there is a plasterwork cartouche* containing the Chichester family coat of arms, two initials and the date of 1608. The roof structure of the two seventeenth century wings contain oak A-frame trusses with mortise and tenon collars*.

Historic Context

Ruxford has an interesting and well documented history. The Devon SMR shows two fords, an ancient boundary marker and a chapel, all in the vicinity of Ruxford (Figure 5.4 and 6.5a). The ancient boundary, referred to in the Sandford Charter of 930, passed from the Watching Seat, or lookout point near Combe Lancey, to Ruxford and then continued to the north of the parish.

[22] Enlargement of photograph is included in Appendix One, Figure 6.5
* see Glossary

The tithe map of 1839 (Figure 6.5b[23]) and an estate map for Ruxford of 1763 (Figure 6.5d[24]) both show a track on the route of this tenth century boundary. The chapel, noted in the Devon SMR, is referred to by Munday (1985), who suggests that William Ralegh (sic), the owner of Ruxford in 1254, obtained permission to build a chapel of ease, which was dedicated to St. George. The exact site of this chapel is not known, but is likely to be close to the track that followed the former boundary route to Combe Lancey and thence to Crediton. There are documents in Barnstaple Record Office that refer to Ruxford Barton. These are dated 1362, 1495, 1530 and 1552 (see Appendix Two). The detailed estate map of 1763, referred to above, outlines the site of the house and buildings and shows the extent of the land in the parish that belonged to the estate at that date. It also shows that there were a number of orchards around the house. Ruxford is shown on the Nordern terrier of 1598, on which it is identified as belonging to the Chichesters. It is also marked on John Ogilby's 1675 coaching map, where the name is spelt as Druxford, and on John Dunn's map of Devon of 1765. The tithe map (Figure 6.5b[25])shows the house and the adjacent buildings and illustrates that there were the same number of orchards as had been identified on the 1763 map (Figure 6.5d[24]). The Ordnance Survey map of 1888 also shows the orchards as well as an increased number of farm buildings around the house (Figure 6.5c[26]). During its history Ruxford has been owned by two of the major Devon estate owners, the Davie family of Creedy Park and the Chichesters. Evidence of the latter's ownership is seen in the plasterwork cartouche* in the house referred to above.

Topographical Situation

Ruxford Barton faces south and is sited on a small spur of sloping ground. There is a nearby water source and the route from Sandford to New Buildings lies close by, to the

[23] Enlargement of photograph is included in Appendix One, Figure 6.5b
[24] Enlargement of photograph is included in Appendix One, Figure 4.3c
[25] Enlargement of photograph is included in Appendix One, Figure 6.5b
[26] Enlargement of photograph is included in Appendix One, Figure 6.5c

north. Figure 6.5a shows that the site is also in close proximity to the geological material, head, considered to be suitable for the construction of cob walls.

Field Visit

The field visit to Ruxford Barton revealed a group of large cob barns situated to the east of the main house with further cob buildings at the rear of the house. A pound house*, for the production of cider, is believed to have been sited in these latter buildings. The barns are shown on the estate map of 1763 and on the tithe map of 1839 (Figure 6.5d and Figure 6.5b[27]). Of these large and impressive cob buildings the lower barn of the group appears to be the oldest. This barn can be discerned in Figure 6.5d[28] shown in yellow and sited facing south west. The current owners of Ruxford Barton report that it is this barn that may be on the site of the thirteenth century chapel. There is an interesting small lancet window set low on the rear wall of the barn. A small part of the original track that led towards Combe Lancey still exists but now finishes at the site of the ford in the valley below the buildings. The rear walls of the main block of the house appear to be constructed of cob. This is confirmed by the current owners.

The large cob barns, the presence of cob in the main building and the documentary evidence regarding the background of this group of buildings combine to illustrate the use of cob for a higher status building.

Case Study Six: Dowrich House

Introduction

Dowrich House and surrounding buildings are another group that is comparable in age, historic significance and status to Ruxford.

* see Glossary

[27] Enlargements of photographs are included in Appendix One, Figure 4.3c and Figure 6.5b

[28] Enlargement of photograph is included in Appendix One, Figure 4.3c

Again, the main building is primarily built of stone but the outbuildings and farmbuildings are of cob construction. One of these outbuildings may have been the former farmhouse and, like Combe Lancey (see Case Study Three), is considered to be one of the few buildings in the study area that is likely to be of fifteenth century origin.

Location

Dowrich House is located to the north of Sandford village and to the west of the settlement at East Village.

Architectural Characteristics, from Listed Description (English Heritage 1985)

The house is described as a former manor house and considered to date from the mid sixteenth century with considerable alterations carried out in the nineteenth and early twentieth centuries. The facade of the building has been rebuilt twice (Figure 6.6[29]). The main building is considered to be constructed of volcanic rubble which is partially rendered. Originally this was a three-room and cross-passage* plan house that faced south-east with a cross wing on the south-western end. There are two lateral stacks*, one projecting to the rear of the hall that has a large mid sixteenth century divided chimney stack with moulded cap, similar to that seen at Woolsgrove (Figure 6.4b[30]). Certain other fifteenth and sixteenth century architectural details survive including moulded mullion windows* and a volcanic stone fireplace. The roof structure includes sixteenth century side pegged jointed crucks* with butt purlins* as well as seventeenth century A-frame trusses with dovetail lapjointed collars*. In addition to Dowrich House other structures in the complex of buildings are also Listed. These include the cob garden walls and an outbuilding to the north of the main house. This outbuilding, constructed of cob, is described as a former farmhouse that was later converted into a kitchen, bakehouse* and store.

[29] Enlargement of photograph is included in Appendix One, Figure 6.6
* see Glossary
[30] Enlargement of photograph is included in Appendix One, Figure 6.4b

It is considered to be of late fifteenth century origin and may be the original manor house prior to the construction, in the sixteenth century, of the present Dowrich House. The outbuilding is described as having a five bay* roof of smoke blackened* jointed crucks* with butt purlins* and ridge*. Also described are chamfered* cross beams on oak posts with jowl heads* and a small mullioned window* made from a single piece of oak. A further Listed structure is a cob barn that is part of a courtyard of farm buildings to the south west of Dowrich House. This is considered to be of sixteenth century origin, remodelled in the early seventeenth century. There is an oak shoulder headed* doorway and three arch headed windows.The roof structure has a surviving side pegged jointed cruck*.

Historic References

The Devon SMR shows that there are two archaeological sites on the hill to the west of Dowrich house. These are described as an enclosure and a Windmill. The hill on which this site is marked is still named Windmill Hill. A further site, a ford, is mentioned to the south where the road from Dowrich to Sandford crosses Dowrich Bridge at Binneford Water (Figures 5.4 and 6.6a). References to Dowrich house are in the Assize rolls for Devon for 1238 and also in the 1349 Feet of Fines (see Appendix Two). The house is shown on Nordens Terrier of 1598 as the home of Mr. Dowrich, and on John Dunn's map of 1765 the house is named Dowrish (Figure 6.6c[31]). This spelling is again used on the First Series Ordnance Survey map of 1809. Risdon (1811) mentions that the family of de Dourishe were in occupation during the reign of Henry III (1207-1272). Munday (1985) gives a full account of the history of the Dowrich family who occupied the site from the eleventh century until the early eighteenth century. At the time of the tithe map and apportionment of 1839 Dowrich is listed as having 243 acres which indicates a substantial agricultural holding.

* see Glossary

[31] Enlargement of photograph is included in Appendix One, Figure 6.6c

The Listed description mentions that there is an early photograph of Dowrich House. A copy of this photograph shows the front facade with pointed arched windows (Figure 6.6[32], Dowrich House facade, 1800s) Later photographs show the facade with gable ended wings and barge boards[*]. The final refurbishment in the late nineteenth century included extensions to the east side of the house, (Figure 6.6[33], Dowrich House facade, 2000). Hoskins (1954) believes that the house was rebuilt about 1600 and he also believes that the outbuilding to the rear is likely to have been the original dwelling house. At the time of the tithe map of 1839 (Figure 6.6b[34]), Dowrich is shown with orchards close to the house in a similar manner to Woolsgrove Farmhouse and Ruxford Barton (see Case Studies above).

Topographical Situation

Dowrich House faces south, as does the earlier building to the rear of the house. The separate Listed barn faces north east. Figure 6.6a shows that all three buildings are built on sloping ground in a sheltered position with high ground to the west. There is a water source to the east of the group of buildings. A roadway leads south from Dowrich to Sandford and there is another route that passes close to the buildings and leads east to the settlement at East Village. The field boundaries around Dowrich have been demonstrated in Figure 5.11. They show that there are a greater number of small fields around the house at the present time than there were in the mid nineteenth century.

Field Visit

The field visit revealed that, although the main house is Listed as being constructed of stone, there is a considerable amount of cob in the walls to the rear of the house. Similar pointed arched windows to those seen on the front facade in the early photograph of the house, were found at the rear of the house. Also at the rear there is a four light mullioned

[32] Enlargement of photograph is included in Appendix One, Figure 6.6
[*] see Glossary
[33] Enlargement of photograph is included in Appendix One, Figure 6.6
[34] Enlargement of photograph is included in Appendix One, Figure 6.6b

window*, mentioned in the Listed description. This window is in a cob wall. The cob outbuilding that may have been the former dwelling prior to the seventeenth century, is now converted into two cottages. These cottages have walls of cob. The small mullioned window*, mentioned in the Listed description, was located in a part of the outbuilding that overlooked the old stables (Figure 6.6e[35]). Munday (1985) suggests that this window lit a small priests room. The separate barn (Figure 6.6d[36]), part of a courtyard of farmbuildings close to the entrance of the main house, proved to have several architectural features of interest. The sixteenth century shoulder headed* doorway is mentioned in the Listed description as are the arched windows close to it (Figure 6.6d[37]). The visit revealed that there had been further windows of a similar type, the original sites identified by arch headed indentations in the cob walls. These windows are also of a similar type to those shown in the early photograph of Dowrich House. A door at the rear of the building displays the initials WR carved into the face of the door which uses an archaic form of R (Figure 6.6d[38]). Internally the barn contains a room with a cross beam supported on a jowl* headed post, similar to that in the former bakehouse at the rear of the main house. There is also a ceiling of plastered wooden strips and a lime-ash* floor. A single side pegged jointed cruck* can be seen in the roof. The barn is part of a courtyard of buildings, all of which were originally constructed of cob although some have been repaired with other materials. The adjoining building contains side pegged* A-frame trusses with cranked collars*. The present owner believes that this was formerly the pound house*, used for the crushing of apples for cider making.

* see Glossary

[35] Enlargement of photograph is included in Appendix One, Figure 6.6e

[36] Enlargement of photograph is included in Appendix One, Figure 4.2b

[37] Enlargement of photograph is included in Appendix One, Figure 6.6d

[38] Enlargement of photograph is included in Appendix One, Figure 6.6d

Dowrich House and farmstead, like Ruxford Barton, demonstrate an interesting and varied group of cob buildings with a known and documented history. They illustrate the use of cob for the construction of early and differing types of building.

Case Study Seven: Park House

Introduction

Park House is a large village house. It is described as being constructed of rubblestone and of nineteenth century origins (English Heritage 1985), but documentary evidence suggests that parts of the building may be earlier.

Location

Park House is located on the south side of Sandford village, with a driveway leading to the house from the main route between Crediton and Sandford.

Architectural Characteristics, from Listed Description (English Heritage 1985)

The description states that the house is large and of early to mid nineteenth century origin with parts of the outbuildings likely to have been constructed in the late seventeenth to early eighteenth century. The main house is described as facing south, of rubblestone construction with stucco* mouldings and sash windows* to the front facade. The interior is described as containing original plasterwork and joinery. The outbuildings are considered to be partially constructed of cob.

Historic References

Park House is recorded in the eighteenth century as part of the estate of the Davie family at Creedy Park, which is situated to the south of the village.

* see Glossary

A plan, dated 1780, shows Park House and its outbuildings (Figure 6.7b[39]). The tithe map of 1839 shows a similar outline for the house and ancillary buildings (Figure 6.7c[40]).

Topographical Location

The site of Park House conforms to the pattern seen in Listed cob buildings in the study area. It is sited on a slope facing south and is near a water source and a major communication route. It is also in proximity to a source of the geological material, head (Figure 6.7a).

Field Visit

A field visit to the property showed that the outbuildings were mainly constructed from cob. Since the Listed description was written these outbuildings have been converted into a domestic dwelling. Figure 6.7g[41] shows the house prior to the conversion. In the roof space of the converted outbuilding the cob walls were found to be have been encased (Figure 6.7d[42]). The top of these walls measured between 300mm and 600mm in width. In addition to the cob walls in the outbuildings it is apparent that the main house is also partially constructed of cob. This is confirmed by Figure 6.7e[43] which shows the cob gable end wall of the main building. The batter*, or inclination, of the walls at the rear of the house, shown in Figure 6.7f[44], is also likely to indicate cob construction as earlier cob walls were built wider at the base than the top.

Further inspection may reveal that, although this building was altered and refurbished in the early nineteenth century, it has older origins and is likely to be primarily constructed from cob with a stucco* facade.

[39] Enlargement of photograph is included in Appendix One, Figure 4.3f
[40] Enlargement of photograph is included in Appendix One, Figure 6.7c
[41] Enlargement of photograph is included in Appendix One, Figure 6.7g
[42] Enlargement of photograph is included in Appendix One, Figure 6.7d
[43] Enlargement of photograph is included in Appendix One, Figure 6.7e
* see Glossary
[44] Enlargement of photograph is included in Appendix One, Figure 6.7f

Case Study Eight: Sandford School

Introduction

The school building represents the use of cob for the construction of a building in a classical Grecian style of architecture that was designed to be prestigious (Figure 6.8[45]). The school was built and donated by Sir John Davie of Creedy Park in 1825.

Location

The school is built at the north eastern edge of the village of Sandford, close to the church (Figure 6.8a).

Architectural Characteristics, from Listed Description

The Listed description of the building is quoted in full to demonstrate the status of the building and the use of cob for public architecture. It also illustrates the problem of recognising cob buildings that are not vernacular and have rendered or stuccoed exteriors.

"School. Dated 1825. Stucco on brick or rubble with exposed Coade stone detail. Slate roof. Large gable-ended rectangular block with west-facing gable-end front. Single storey. Front articulated in the manner of a portico of six approximately Doric half-columns supporting a plain entablature and gable end. The columns, which are unfluted, stand on a granite stylobate of 3 steps extending to 6 at the right end. Between the half-columns 5 architraves with pediments on brackets; those to left and right extending to the bottom as doorways with 12-pane overlights and the 3 between containing sash windows with 24 panes above and 4 below. Entablature inducts the legend Sandford School MDCCCXXV in large semi-bold serif capitals. The low pitch roof is carried forward as deep eaves probably replacing pediment. 4-window sides of high 2-light windows with 2 sets of mullions and glazing bars. The returns of the portico are marked on either flank as indents" (English Heritage 1985).

Historic References

There was a school in Sandford from 1677. The ninth Davie baronet was the benefactor of the new school, which was constructed from cob and built from a model. The model is still in existence at the school and demonstrates the changes that have taken place particularly in respect of the porticoed* entrance, which was originally open with free standing columns

[45] Enlargement of photograph is included in Appendix One, Figure 1.2f
* see Glossary

(Figure 6.8d[46]). The Davie crest formerly embellished the apex of the pediment*, but this was removed at a later date. On the tithe map, the school is shown surrounded by an area of land, presumably also gifted by the Davie family, that provides a playground area for the school (Figure 6.8c[47]). Alterations were carried out in 1937 when the school ceased to belong to the Davie family and became the property of the Education Authority. Drawings made at this date show a rectangular building with a central wall (Figure 6.8b[48]).

Topographical Location

The building faces west on a sloping site and is set back from the road. The source of the building material is not known, but there is an accessible source of the geological material, head, at a distance of 150 metres and on the same contour level as the site (Figure 6.8a).

Field Visit

The building is in current use as a primary school and presents as a large, classical building. The fact that it is constructed of cob is not immediately obvious, but was confirmed by the headmistress who stated that the internal longitudinal dividing wall between the two main rooms is also constructed of cob. The original model of the school was seen and the fact that the building was likely to have been constructed from this model, as no original architectural drawings have been discovered, was explained by the headmistress.

The quality and status of this building is in contrast to the smaller middle status cob farmhouses and cottages in the study area.

[46] Enlargement of photograph is included in Appendix One, Figure 6.8d
[47] Enlargement of photograph is included in Appendix One, Figure 6.8c
[48] Enlargement of photograph is included in Appendix One, Figure 6.8b

Conclusions drawn from the Case Studies of Listed Buildings

The advantage of integrating the architectural data, obtained from the Listed descriptions, with regional historic and topographical information is illustrated in the case studies reviewed above.

The benefits of referring to cartographic material, both historic and current, is demonstrated in the case studies on The Old Forge and Gaters. In the former building, the part used as the forge had been mistakenly identified due to later alterations. The evidence of the tithe map corrected this mistake. In the latter case, the tithe map and an earlier photograph verified that the barn at the rear of the building had previously been of a greater length, but that part of it had been incorporated into the living quarters of the house.

Four buildings were included in the case studies because their described architectural characteristics, history and siting all indicated former importance. These were Woolsgrove Farmhouse, Ruxford Barton, Dowrich House and Park House. Although the latter three were Listed as being constructed of stone they were found to contain areas of cob material, predominantly in the rear walls. In all cases field visits revealed that attached or adjacent farm and other outbuildings, were constructed of cob.

Nearby archaeological sites were evident in relation to three of the buildings reviewed: Combe Lancey, Dowrich House and Ruxford Barton. These were in proximity to early enclosures, fords, tracks and other features which may be relevant to the presence of these fifteenth and sixteenth century buildings.

Park House and Sandford School demonstrate that a knowledge of the historic context is important in assessing a building's significance. The school is Listed as constructed of stone, but documentary evidence indicated that the building was constructed of cob, a fact that was confirmed by internal examination of the building and verified by the headmistress at the time of the field visit.

The majority of the buildings reviewed in these case studies were found to be close to a source of the geological material, head. The importance of this material in the construction of cob buildings has previously been suggested, but not verified.

The case studies on Listed cob buildings demonstrate that knowledge of historic and topographical contexts can clarify and augment existing information and can assist in identifying the buildings of greatest significance.

Part II: Case Studies of non Listed Cob Buildings

The successful outcome of using the integrated databases to enhance and discover further information about the Listed cob buildings described in the case studies above, prompted the author to explore the potential of using the methodology to identify previously unknown or non Listed cob buildings. Twenty two non Listed buildings of potential interest were included in the descriptive database (see Table 4.1, page 333, Appendix Three). Grid References were obtained for these buildings from current OS maps and the buildings were incorporated into the descriptive database and included on the digitised spatial datasets (see Figure 5.5). Nineteen of these are identified in historic documents prior to the nineteenth century (see Table 6.1).

Locations

The locations of the non Listed buildings corresponded with groups of Listed cob buildings. No buildings of potential interest were located in the main settlement of Sandford other than those that were already Listed.

Cob ID	Name	Grid Reference	Documentary References	Prebendary Farm	Included on 1598 map	Included on 1765 map	Included in other maps	Owner in 1839	Near head
213	Bawdenhayes	282509/103345	C17					Davie 38	
214	Clampitt	282209/103839	C18					Davie 32	
215	Doggetsbeer	281888/104541	C14			Yes		No data	Yes
216	Priorton Barton	283540/104945	C14		Yes	Yes		Tremlett 330	
217	Cross Barton	280610/102276	C14	Yes	Yes			Quicke 106	Yes
218	Aller Barton	281051/102015	C14	Yes	Yes			Quicke 117	Yes
220	Frogmire	282575/101514	C13				C19	Davie 98	Yes
221	Venn	283629/102628	C14, C18				C19	Davie	Yes
222	Long Barn	284100/101664	C15	Yes				Davie 138	Yes
223	Creedy Park	283211/101664	C18				C19	Davie 24	
224	West Sandford	280953/102845	C14, C17	Yes		Yes		Quicke	Yes
225	Burridge	281574/105543	C14		Yes			Davie 200	
226	West Pidsley	280991/105154	C10		Yes	Yes		Davie 200	Yes
228	Ashridge	282478/106201	C14		Yes			Brown 147	
229	Yelland	282177/105581	C14			Yes		Sillifant 83	
230	Spicers	281940/104820	C18					Crediton trust	Yes
231	Swelthills	279085/103614	C18					Burrows 46	
232	Frostland	278767/104070	C16		Yes		C18	No data	Yes
232	Ash Bullayne	272332/104288	C14					Wreford 141	

Table 6.1
References to non Listed cob buildings in study area

Historic References

The origins of the present buildings are not known, but documentary evidence reveals that the sites were occupied at certain dates (see Table 6.1). West Pidsley, in the north of the study area, is identified in the Sandford Charter of 930 (Rose-Troup 1942). Frogmire, in the south of the parish, is mentioned in documents of the thirteenth century (see Appendix Two). Four former prebendary farms in the parish are included. These are Cross, Aller, West Sandford and Long Barn, (formerly Creedy). These farms were in the ownership of the collegiate church at Crediton and the documentation referring to them is from the same sources as the prebendary farms in the study area that are Listed: Woolsgrove, Henstill and Rudge. Historic maps indicate the presence of several buildings that are not Listed. The Nordern Terrier of 1598 shows seven non Listed buildings, including the prebendary farms mentioned above. John Dunn's map of Devon of 1765 includes five buildings that are non Listed. The tithe map and apportionment of 1839 indicate the ownership and acreage of every building in the parish at that date. From these documents it is apparent that eight of the nineteen buildings selected belonged to the Davie family of Creedy Estate. Three of the other buildings were owned by the Quicke estate, of the nearby parish of Newton St. Cyres.

Topographical Locations

Field visits confirmed that all of the non Listed buildings under discussion face south or south-east. The majority are sited on sloping ground, the exceptions are those that are situated on the valley floor. One, Clampitt, is sited in a slight hollow, which corresponds with the original name of the site, Cloam-pitt, which is recorded in the Recovery Rolls of 1749 (Gower, Mawer and Stenton 1932). All the buildings are sited close to a source of water and the majority are near to a road or former track. Small, irregular field boundaries, or remains of field boundaries, are shown close to some of the buildings (see Figure 5.5).

These may indicate former farming practices. Where it has been possible to ascertain the solid and drift geology of the site it is found that there is a strong tendency for the earlier sites to be on or near head.

Field Visits

Field visits were undertaken on four of the non Listed buildings. All fulfilled the established location criteria of facing south or east and being close to water and road systems. There is also historic documentation in existence relating to these buildings that indicates they may be of particular interest. The non Listed buildings used for these case studies are two of the former prebendary farms, Aller and Cross, plus two farmhouses, Frogmire and Doggestbeer. Each case study will be divided into five sections, including an introduction and a report of a field study.

Case Study Nine: Aller

Introduction

Aller is one of the former eight prebendary farms that were in the ownership of the collegiate church at Crediton until the dissolution of the monasteries in 1539.

Location

The farmstead is sited close to the former tithe or toll road that passes along the south of the parish.

Historic References

The first historic reference to Aller is in 1333 when it is mentioned in conjunction with the other prebendary farms. From the amount of pension, or tithe paid to the church, it appears that Aller was of lesser importance than Woolsgrove, but of greater value than Cross (see Chapter Four, pages 113 and 114). References to Aller are recorded at the time of the dissolution of the monasteries and again in 1547 (Oliver 1846). Aller is included in the Nordern map and terrier of 1598 (see Appendix Two), at which time it was in the ownership of the Chichester family. There are baptismal records referring to Aller in the early seventeenth century and by the time of the census in 1790 the farm was occupied by a family and six apprentices, or farm servants. In 1826 the farmhouse was apparently destroyed by fire (Munday 1985). From the tithe map and tithe apportionment it is apparent that Aller, at that date, owned one hundred and seventeen acres, the majority of which was used for arable purposes, (Figure 6.9 b and 6.9c[49]).

Topographical Situation

Aller Barton is sited on a slope, facing south. The buildings are close to water and the road mentioned above. It is also close to an ancient trackway and the Watching Seat or lookout point mentioned by Rose-Troup (1942: 241) and referred to in Case Study Three on Combe Lancey. Figure 6.10a shows that the buildings are in proximity to the geological material, head.

Field Visit

A field visit to Aller revealed a cob farmhouse of early nineteenth century origins, but with apparently earlier cob walls incorporated that may have survived the fire of 1826. A large barn appears to be of an earlier date than the remainder of the farmbuildings. The site of Aller conforms to the pattern established by the analysis of Listed cob buildings in the study area in the previous chapter, but the majority of the earlier farmhouse has been destroyed. The cob farm buildings, that survived the fire, may contain earlier fabric.

Case Study Ten: Cross

Introduction

The history of Cross proved to be similar to that of Aller, a former prebendary farm where the farmhouse was destroyed by fire in the nineteenth century.

[49] Enlargements of photocopies are included in Appendix One, Figures 6.9b and 6.9c

Location

Cross is sited a short distance to the west of Aller, close to the former toll road. The SMR records evidence of the remains of a stone cross close to the entrance to Cross.

Historic References

The same documents that refer to Aller, Woolsgrove and the other prebendary farms also refer to Cross. From the amount of tithe paid Cross would appear to have been a smaller farmstead (see Chapter Four, pages 113 and 114). One of the early prebendaries at Cross, Thomas de Crosse, took his name from the farmstead. As with Aller and Woolsgrove there are continuous records of the different owners or tenants of the farmstead from 1333 to the present day. The tithe map and apportionment of 1839 show that the landholding at that date was in excess of one hundred acres and that the land was both cultivated and grazed. Orchards and a pound house are also recorded (Figure 6.9 b and 6.9c[50]).

Topographical Situation

Cros is in a similar topographical location to Aller. It faces south and is on a slope, there is water nearby and the buildings are close to an historic route. This is shown on Figure 6.10a, as is the fact that the geological material, head, is close to hand.

Field Visit

The present Cross farmhouse was built at the end of the nineteenth century and occupies a site to the west of the former house. The original site is closer to the farmbuildings, which consist of massively walled cob buildings built around a courtyard.

[50] Enlargements of photocopies are included in Appendix One. Figures 6.9b and 6.9c.

The sites of both Aller and Cross conform to the location pattern established by other cob buildings in the study area, but both the earlier farmhouses have been destroyed. In the case of Aller there is likely to be original material incorporated in the present early nineteenth century farmhouse, but Cross has been completely rebuilt. The interest in these two former prebendary farms lies in the cob farmbuildings. It would be worthwhile to investigate these further.

Case Study Eleven: Frogmire

Introduction

The name, Frogmuire, appears in a document dated 1261 (see Appendix Two). The history of the building and its topographical setting indicated that it might be constructed of cob and of historic interest, despite the fact that the facade facing the road shows a middle to late nineteenth century farmhouse. Features at the rear of the building, however, show evidence of an earlier constructional date, in particular, the presence of a large lateral chimney beside a large entrance doorway (Figure 6.10[51]).

Location

Frogmire is sited in the south of the parish close to the junction of the old toll road and the road leading to the village of Sandford. Combe Lancey lies a short distance to the west and Creedy Park an equal distance to the east (see Figure 5.5).

Historic References

The earliest documentary references to Frogmire are from the mid thirteenth century. It appears likely that it was acquired by the Creedy Park Estate in the early seventeenth century together with the neighbouring Combe Lancey (Munday 1985). It became the home farm to the estate, but was in other ownership at the time of the 1790 census.

[51] Enlargement of photograph is included in Appendix One, Figure 4.2e

In the early nineteenth century it is recorded as paying a similar Poor Rate to the large farm at Woolsgrove (Munday 1985). From this it is assumed that Frogmire was of equal size and importance. By the middle of the nineteenth century the building was again in the ownership of the Creedy Park Estate. The tithe map of 1839 (Figure 6.10d[52]) shows Frogmire with a courtyard of buildings to the west and a track passing close to the house and continuing to Combe Lancey. An estate map of 1860 shows Frogmire sited close to the toll road with the number of surrounding buildings increased (Figure 6.10c[53]). A large pond is depicted to the north of the buildings. The Second Edition Ordnance Survey map of 1906 shows a similar number of outbuildings and the track to Combe Lancey, but no pond is shown (Figure 6.10b[54]). The current field boundaries, shown on Figure 6.10a, are similar to those of the tithe map of 1839 and those of the estate map of 1860.

Topographical Situation

Frogmire faces south, on the floor of a valley at a height of 65 metres above sea level and is close to a source of water and to a major ancient route. Geologically, it is sited close to a source of head material (Figure 6.10a).

Field Visit

The information obtained from the descriptive and spatial datasets, and the scanned and stored graphic material, was confirmed by the evidence seen on a visit to Frogmire. Externally, the facade facing the entrance track from the road did not indicate the age of the building. The roof pitch has been altered and the plastered facade belies the earlier origins of the building. Behind this facade there is a rectangular cob construction with an outshut* to the north.

[52] Enlargement of photograph is included in Appendix One, Figure 6.10d
[53] Enlargement of photograph is included in Appendix One, Figure 4.3e
[54] Enlargement of photograph is included in Appendix One, Figure 6.10b
* see Glossary

The main block faces south and has a large lateral stack (Figure 6.10[55]). The roof space demonstrates some of the alterations that have occurred. There are sawn off former roof timbers that appear to have been jointed crucks* and some of these have remains of smoke blackening* (Figure 6.10g[56]). The house has been reduced in size from the original building and now has four bays* although it is likely to have originally had six bays*. There is evidence of this in the rebuilt end gable wall. The cob walls measure 800mm at the top of the plinth* and become narrower towards the roof line. The width of the cob walls at the base of the walls may indicate an earlier cob building (Child and Keefe 2000). Internally the original house appears to have been of a three-room and cross-passage* plan. There are several interesting architectural details including a plank and muntin* screen (Figure 6.10f[57]) and chamfered beams one of which has different stop endings on each side of the beam, both of probable early seventeenth century design (Figure 6.10e[58]). The original porch is now the fireplace and contains a squint light that would have permitted a view of the original approach to the house. The outbuildings are predominantly of cob construction and are reduced in number from those shown on the tithe map and the earlier estate map. In the collapsed wall of one of the outbuildings the current owners have found shards* of early yellow glazed pottery and a small notched stick, thought to be either a toy or perhaps a tally stick. (A notched piece of wood historically used for keeping accounts). A prehistoric knapped* flint has also been discovered.

[55] Enlargement of photograph is included in Appendix One, Figure 4.2e
* see Glossary
[56] Enlargement of photograph is included in Appendix One, Figure 6.10g
[57] Enlargement of photograph is included in Appendix One, Figure 6.10f
[58] Enlargement of photograph is included in Appendix One, Figure 6.10e

These artefacts are of interest as they may indicate the length of time the site has been occupied, but they cannot be considered as reliable evidence of the date the wall was constructed as they may have aleady been present in the earthen material used at the time of construction.

The field visit revealed an architecturally and historically interesting building. The site of the former large pond, to the north of the building, partially overlies head and is likely to have been the source of the cob material used for the walls of the house and the outbuildings. The visit confirmed the information revealed by the stored topographical and historic data relating to the study area and demonstrated the use of the methodology for discovering existing potentially important cob buildings that have not previously been identified.

Case Study Twelve: Doggetsbeer

Introduction

This farm was selected as the fourth non Listed building to be studied because of its interesting name and the fact that the topographical and geological situation complies with the pattern already established for earlier cob buildings.

Location

Doggetsbeer is situated towards the north of the study area, at the end of a short track to the west of the road that travels from Sandford in the south to the neighbouring parish of Kennerleigh in the north (see Figure 5.5).

Historic References

Doggetsbeer is sited below a known early enclosure and linear feature. The site of Doggetsbeer is first mentioned in the Subsidy Rolls of 1330, with the name of the then owner given as a man named Docket (Munday 1985). The name appears again in the

Recovery Rolls of 1650 (Gover, Mawer and Stenton 1932). Figure 6.11b[59] shows that Dunn's map of 1765 marks the site as Dogbere. Figure 6.11c[60] shows that this changes to Dogbear on the tithe map of 1839. On the First Series Ordnance Series map of 1809 the name given is Dogbeer. Munday (1985) states that the original house has been demolished and replaced by a recent bungalow. Enquiries in the village of Sandford suggested that this opinion was also held by residents of the parish.

Topographical Situation

The siting of the original Doggetsbeer farmhouse conforms to that of other earlier cob buildings in the study area. The tithe map shows that the main block faces south east with an attached outbuilding extending at right angles to the west end of the building creating an L-shaped building (Figure 6.11c[61]). The building is on the floor of a small valley, close to a water source and with the hillside sloping upwards to the west of the buildings. The geological dataset shows that there is head material close to the buildings (Figure 6.11a). The current dwelling, a bungalow, is sited at a distance of approximately one hundred metres to the east of the original buildings.

Field Visit

Despite the evidence that the original house had been demolished it was decided to visit Doggetsbeer to collect samples of soil for analysis. The first impression of the farmstead is that the original house has been replaced by a bungalow and that most of the buildings are constructed of modern materials, with the occasional small structure showing evidence of remnants of cob walling. This impression proved to be incorrect.

[59] Enlargement of photograph is included in Appendix One, Figure 6.11b
[60] Enlargement of photograph is included in Appendix One, Figure 6.11c
[61] Enlargement of photograph is included in Appendix One, Figure 6.11c

Located at a distance of approximately 100 metres from the present farm bungalow the substantial remains of the former farmhouse were contained within a modern farm building. In a similar manner to the original farmhouse at Dowrich (see Case Study Six), this construction has been erected over the walls of the earlier building. The owner explained that he used the building for lambing as the cob walls provided warmth in the early part of the year, but had placed the new building over the old to weatherproof the structure. He also commented that, for personal reasons, he did not wish to demolish the earlier farmhouse. Doggetsbeer farmhouse is of a two-room through-passage* plan and, despite its present condition, the former layout and development of the building is visible. It contains signs of having been of middle status and may have originally been of three-room cross-passage* plan. Both the remaining rooms have large fireplaces. The plinth* of the building is of coursed stonework and the remains of the internal woodwork show ovolo* moulding to window frames (Figure 6.11f[62]). There are chamfers* to the door frames and the bressumer* beam over the end fireplace. The large lateral fireplace has splayed granite sides and a granite bressumer*. The floors are of lime-ash* and there are indentations in the cob wall showing where a plank and muntin* screen was fixed (Figure 6.11d[63]). The present owner removed this screen. The roof is missing but there is one socket of a former cruck truss remaining. The cob walls are between 400mm and 500mm in width at the top of the plinth. The internal axial wall between the upper room and the passageway is also constructed of cob which is of a similar width (Figure 6.11e[64]). The integral outbuilding at right angles to the main block has an interesting smaller building at the southern end.

* see Glossary
[62] Enlargement of photograph is included in Appendix One, Figure 6.11f
[63] Enlargement of photograph is included in Appendix One, Figure 6.11d
[64] Enlargement of photograph is included in Appendix One, Figure 6.11e

This building has a cobble floored room at ground level, with a collapsed ceiling through which can be viewed a small chamber above that contains a corner fireplace with a cob smoke hood* (Figure 6.11g[65]). It is thought that this was a former apple store and pound house*. The tithe map of 1839 shows orchards surrounding the farmstead (Figure 6.11c[66]).

Doggetsbeer is a fascinating relic of a cob building with many existing architectural features of interest including the former pound house*. The later granite fireplace with ashlared* supports indicates that at some date this building may have been of former importance.

Conclusions drawn from the Case Studies on non Listed Buildings

Time did not permit further case studies to be undertaken on the remaining fifteen non Listed buildings. However, from preliminary field visits to the sites it is thought that the majority are likely to be constructed of cob, or to contain cob within the fabric of the buildings. The majority of the buildings have adjacent cob outbuildings. The exception is Priorton Barton which is built of stone. However, as with Ruxford Barton and Dowrich House, there may be cob walls incorporated into part of the present building.

The two former prebendary farmhouses, Aller and Cross, have been rebuilt, but the remaining large farmbuildings are of considerable interest. Frogmire has a history of estate ownership and contains architectural features that indicate former importance. The architectural details within the house are comparable to those of buildings in the parish that are Listed Grade II. Doggetsbeer is a fascinating historic building, in an original condition that allows its structure and development to be observed.

* see Glossary

[65] Enlargement of photograph is included in Appendix One, Figure 6.11g

[66] Enlargement of photograph is included in Appendix One, Figure 6.11c

Discussion

The first eight case studies demonstrated that the ability of the methodology to display visually cartographic, graphic and photographic material, as shown in Figures 6.1 to 6.8, could be used to enhance the Listed descriptions of the cob buildings. Two of the case studies, on Park House and on Sandford School, revealed the problem of identifying cob buildings that have altered facades. The four case studies on the non Listed buildings also demonstrated the problems of identifying interesting cob buildings that have been altered. This clearly demonstrates the potential of the methodology to discover previously unknown cob buildings.

The field visits to both the Listed and the non Listed buildings also revealed the numbers of farm and ancillary domestic buildings that are constructed from cob. It is these, often redundant, buildings that are important to inspect and catalogue as they are more likely to be at risk of destruction than the occupied farmhouses and houses (Keefe and Child 2000: 38).

Conclusions

The case studies described in this chapter support the results of the general analysis of all the Listed cob buildings described in Chapter Five, and also show how the developed methodology can be applied to analyse individual cob buildings. The eight studies on Listed cob buildings show the advantages of using the methodology to augment, verify and illustrate the architectural portrayal of the cob buildings contained in the Listed descriptions. The findings from the four case studies on the non Listed buildings demonstrate the predictive ability of the inventory methodology to identify previously unrecorded cob buildings using the triangular concept discussed in Chapter One: combining documentary information with topographical factors to discover their location.

CHAPTER SEVEN – CONCLUSIONS

The dictates of the research brief required the developed methodology be capable of describing, analysing and characterising earthen buildings in a geographical area in central Devon, a methodology that would have a local context but would also have the capability of providing the basis for a national inventory system for earthen buildings throughout the United Kingdom. The brief also required that the distribution of the cob buildings in relation to the geology, geography, settlement patterns and building traditions of the area be demonstrated, with the results compiled as interrelated thematic maps. Finally, the brief dictated that a comprehensive literature search be undertaken to discover sources of literature, both historic and current, relating to earthen architecture.

This brief presented a challenging task and to fulfil the requirements a multi-disciplinary approach was taken. An approach that set out to explore the notion that to design an inventory methodology that would address the composite needs of the brief, it would be necessary to include architectural, topographical and historic factors relating to cob buildings, a triangular concept that is graphically illustrated on page 9 of this thesis. In order to complete this task six aims were identified, as discussed in Chapter One.

In this concluding chapter a summary is presented of the resolution of these aims and how, by using the concept described, the requirements of the brief were fulfilled.

The first and central aim of the thesis has been to demonstrate that in describing and locating traditional earthen architecture it is important to consider the physical surroundings and the history of the buildings, as well as the surviving architectural details.

A wide ranging literature search was undertaken in order to gain a better understanding of these key elements, a survey that explored not only literature on earthen building, which was required by the brief, but also literature on landscape history and historic documentation. This literature survey, described in Chapter Two, satisfied the second aim of the thesis: to identify sources of information that would assist in the achievement of the first aim.

The survey of historic and current work relating to earthen buildings provided information on the spatial distribution of cob buildings and the varying constructional techniques used. This guided the selection of architectural data for inclusion in the inventory database. Discussion on relationships between earthen buildings and physical, social or historic contexts was found to be lacking in the literature, but there was widespread agreement on the urgent need to classify and inventory surviving historic earthen buildings.

The important discovery of previously unrecorded historic literary material on earthen building in the United Kingdom, particularly cob building, provides a significant contribution to the body of existing references. Because of the importance of these historic references they have been fully described in a separate report for the Centre for Earthen Architecture at the University of Plymouth (Ford 2002).

The literature considered on the history of landscape supported the concept that in order to understand the development of settlements, and the siting of individual buildings, it is necessary to interpret their physical surroundings. Information gained from this body of work determined the selection of topographical factors for inclusion in the inventory database.

The importance of using historic documentation to verify changes in the landscape has been demonstrated in the literature on landscape history. Literature on historic buildings and literature on sources and types of documentation directed the search for relevant evidence that could be incorporated into the inventory database.

The third aim of the thesis was to examine critically existing methods used for cataloguing buildings. Chapter Three describes a range of local, national and international recording procedures and Tables 3.1a and 3.1b summarise the similarities and differences that were identified. These demonstrate that the methodologies reviewed were not designed to incorporate geographical and historic data, as well as architectural information, and that, if the triangular concept was to be developed, a more appropriate method was required for creating an inventory of cob buildings. The comprehensive nature of the proposed methodology is well illustrated by the number and diversity of the items included in the descriptive database, shown in the final columns of Tables 3.1a and 3.1b. When compared with the other methodologies described, it becomes apparent that the proposed methodology has greater capacity and is able to include a wide range of disparate data that relate to all three aspects of the triangular concept.

The fourth aim of the thesis was to construct the inventory methodology and to select a study area in which to demonstrate its possible applications. Chapter Four describes Sandford, the selected study area and explains, in detail, how a relational database, linked to a GIS, was used to develop a methodology appropriate for inventorying cob buildings within the parish, a methodology that is capable of fulfilling the requirements of the original brief.

The results achieved from analysis of the collected data relating to the cob buildings in the study area are fully described in Chapter Five. As stated in the introductory chapter (Chapter One, page 7), no previous systematic study of earthen buildings has been undertaken, and so the completed tabular database, illustrated in Table 4.1 and in Appendix Three, provides an extremely useful tool both for the current project and for future use. A tool that permits the interrogation of the collected data in order to solve particular problems and, in its electronic form, provides a flexible and effective resource.

The results, discussed and illustrated in Chapter Five, demonstrate the power of the developed inventory methodology to describe and analyse the characteristics of the cob buildings. They also show, that by utilising the GIS program, the methodology is able to demonstrate the buildings in relation to the geology, geography and settlement patterns of the area and to investigate relationships between the created descriptive and spatial datasets relating to the buildings.

The objective of this thesis, (Chapter One, page 8), was based on a triangular concept: that to develop a systematic methodology for inventorying earthen buildings it is necessary to consider relationships that may exist between the architectural elements, topographical factors and historic aspects that relate to the buildings. The constructed methodology has demonstrated its ability to realise this concept.

Finally, the methodology is shown to have the capability to compile interrelated thematic maps to illustrate the results of the analyses (see Figures in Chapter Five). By so doing, the created methodology has fulfilled all the requirements of the original brief, detailed in Chapter One, and represents the first systematic study of a group of cob buildings, in a defined area of Devon, that combines descriptive architectural and documentary evidence with topographical information. This represents a significant contribution to the expansion of current knowledge of regional earthen architecture in the mid Devon area, and provides a model of active data, albeit at present for only a small area, that is available for use at the Centre for Earthen Architecture at the University of Plymouth.

The ability of the developed inventory to provide quantifiable information about existing cob buildings and their topographical and geological surroundings supports the aims of the Centre for Earthen Architecture, described in Chapter One: to ensure that the heritage of earthen building in the west of England is maintained, and that earth is promoted as a viable contemporary building material.

To demonstrate further the ability of the developed methodology and to satisfy the fifth aim of the thesis, namely, the use of the inventory methodology as a potential research tool of importance in the conservation field, a limited series of twelve detailed case studies was carried out on individual cob buildings within the study area. These are described in Chapter Six. The value of the methodology as a comprehensive system able to augment, verify, or correct the information contained in the Listed descriptions of these buildings, was demonstrated in the first eight case studies.

Following the success of using the methodology for inventorying Listed cob buildings in the study area, a trial was undertaken to establish whether the methodology could be used for identifying important, but non Listed, cob buildings. The final case studies describe four of the nineteen buildings in the study area that were identified, from historic documents and from their topographical locations, to be of interest. Identification of these interesting cob buildings was made possible by using a combination of the triangular concept and the GIS.

Although this represents a very small sample of buildings, the two former prebendary farms, Aller and Cross (Case Studies Nine and Ten), the formerly important Frogmire (Case Study Eleven) and the exciting discovery of the derelict Doggetsbeer (Case Study Twelve), illustrate the value of the developed methodology as a predictive tool for conservation purposes.

The field visits to both Listed and non Listed buildings revealed numbers of farm and ancillary domestic buildings that were constructed of cob. It is these, often redundant, buildings, that are most likely to be at risk and are important to identify, inspect and catalogue. The described methodology would assist in the identification of such buildings and their inclusion into the established cob inventory database would clarify the numbers of cob buildings still extant in the study area.

The final aim of the thesis was to consider ways in which the developed methodology might be improved in order to utilise its capabilities and further its use as a tool for the better comprehension and conservation of cob buildings. In order to meet these aims the following six suggestions are made:

1. For the better understanding of the development and survival of cob buildings an enhanced database is required, one that contains more complete information regarding architectural elements that relate to cob constructional techniques, including the heights of plinths and lifts, the thickness of walls, the type of roof structure and original plan forms. To achieve this objective further fieldwork is required, particularly internal inspections of the buildings.

2. It would be advantageous to acquire additional documentary evidence relating to cob buildings. Devon has rich and varied sources of archival information and further research into these could provide information regarding historic, social and economic aspects of areas with a high incidence of cob buildings, and the effect of these aspects on the buildings.

3. The use of the methodology in adjoining parishes to Sandford, the study area, would augment the number of cob buildings included in the inventory and increase the value of the work of this study.

4. The results of the analysis described in Chapter Five demonstrate that there is a role for the use of a GIS system in the development of an inventory methodology. For the enhancement of the methodology it is suggested that greater use is made of the techniques available from a GIS in regard to exploring relationships between cob buildings and the surrounding topography. These include the use of digital elevation modelling, the measuring of the slope of the land in relation to the siting of the buildings, and the use of buffer analysis to measure distances from the nearest suitable geological materials for the repair of cob buildings.

5. This inventory methodology has been designed for use with cob buildings but, with modifications, is of potential value for inventorying and characterising traditional buildings constructed of locally sourced materials other than cob. It is also of potential use for thematic surveys of differing types of buildings including rural churches or schools, farm buildings or estate or garden architecture.

6. In the conservation field the developed methodology is capable of being used as a teaching aid. Further work is required to enhance this ability.

Final conclusions

In summary, the conclusions reached at the completion of this study of cob buildings in the parish of Sandford, are that the original objectives of the brief have been achieved. The triangular concept, illustrated in Chapter One, has been developed into an innovative and holistic methodolology for creating an earthen building inventory. An inventory that is capable of incorporating architectural elements, topographical factors and historic aspects relating to cob buildings in a given area of mid Devon.

This thesis represents the first systematic study of a group of cob buildings in Devon and provides a distinct and significant contribution to the current knowledge of earthen buildings in the area, a contribution that is also of importance to the conservation of the earthen building heritage of the south west of England. The inventory methodology described has the potential to be extended to encompass earthen buildings in parishes throughout Devon or to be employed to inventory regional traditional buildings constructed in materials other than earth.

In the Foreword to *Terra Brittanica,* John Fidler (2000) comments on the numbers of earthen structures that remain unrecognised because of refacing or rendering. They may also remain unrecorded because their significance is not appreciated. The recording methodology described in this thesis offers a solution to these problems in relation to cob buildings in Devon, a solution that could form the basis for a national inventory system for earthen buildings throughout the United Kingdom.

APPENDICES

APPENDIX ONE – ENLARGEMENTS OF PHOTOGRAPHS

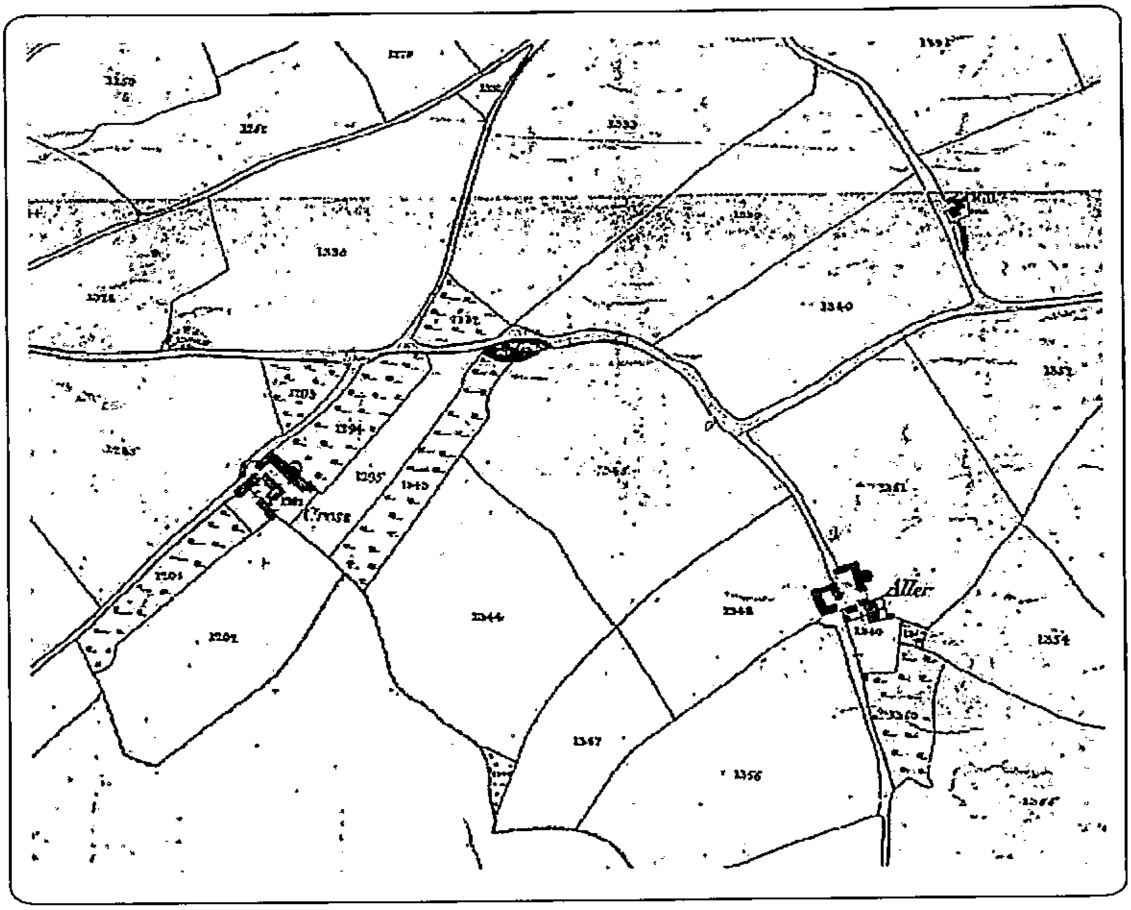
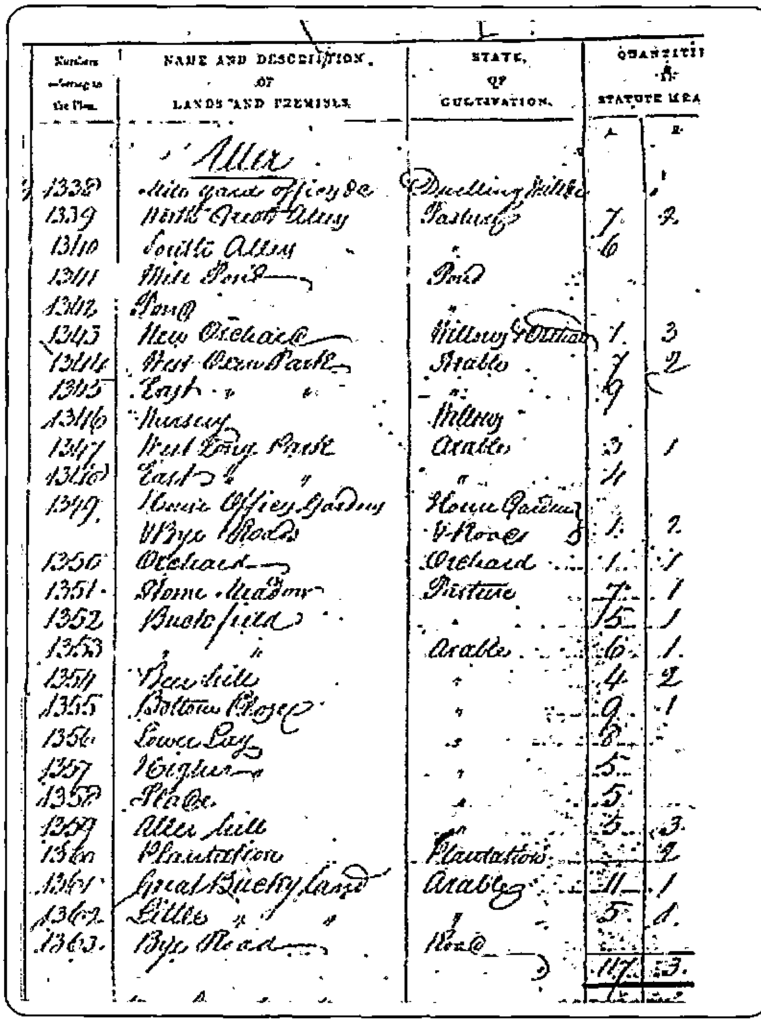
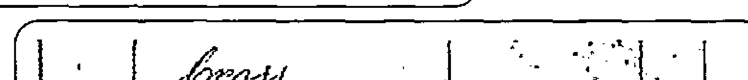


Photo: M.Ford

Tithe map showing Aller and Cross 1839

Figure 6.9 Enlargement of photograph b)

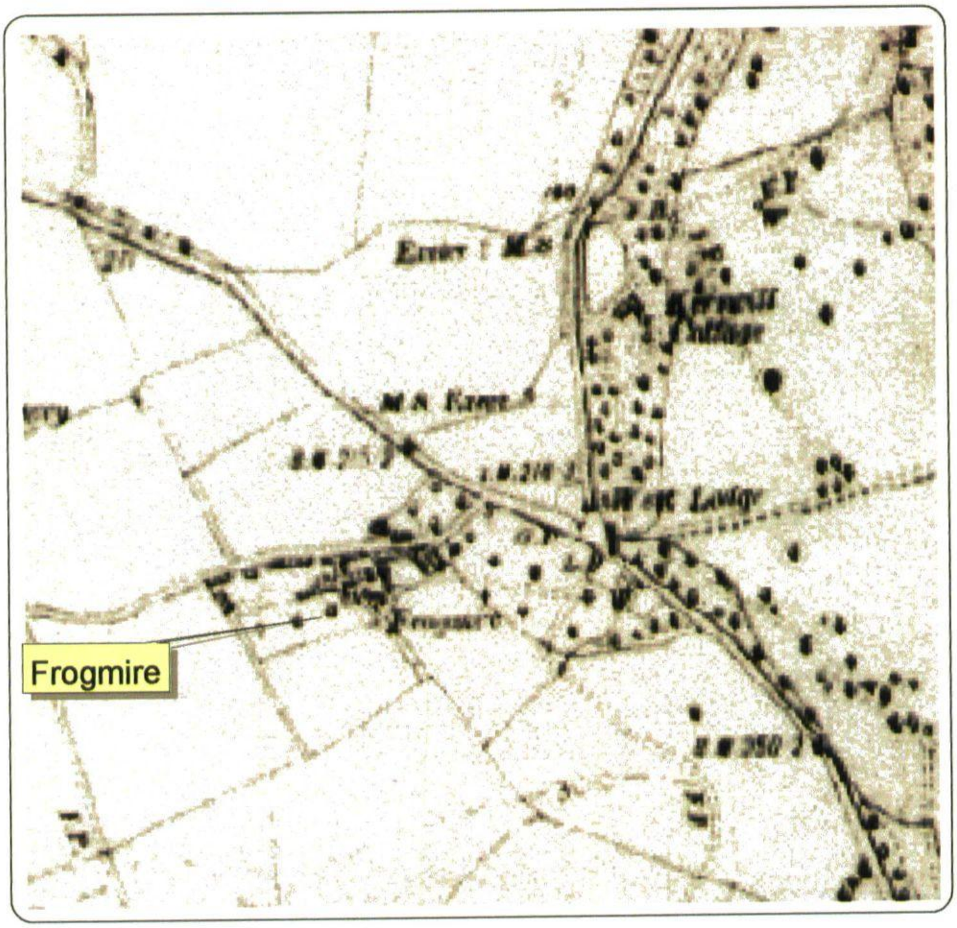




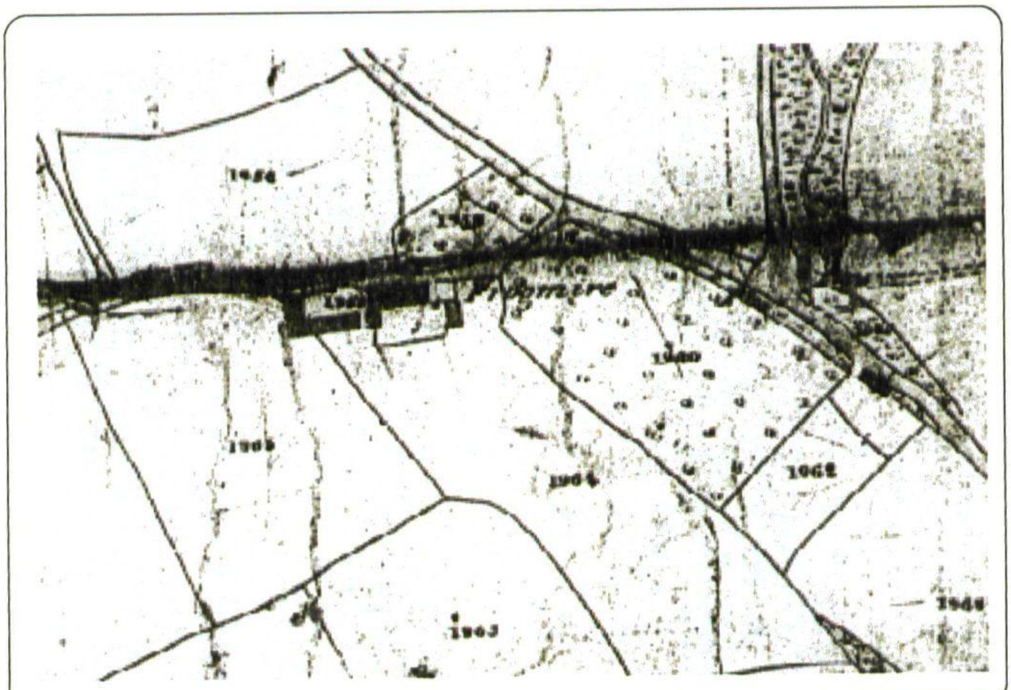
Photos of original: M.Ford

c) Tithe apportionment showing entries for Aller and Cross

Figure 6.9 Enlargement of photographs c)



b) OS map 1906



d) Tithe map showing Frogmire 1839

Figure 6.10 Enlargement of photographs b) and d)

Photos of originals: M.Ford

APPENDIX TWO - DOCUMENTARY MATERIAL

SANDFORD Records in the Devon Record Office, Barnstaple

Ecclesiastical:
1530 Advowson 50/11/1/8X

Estate:
1362 Ruxford 50/11/1/1
1530 Ruxford 50/11/1/8X
1865-1897 Rentals B170/2235/1-3
19-20C Rentals etc B170 add/40/47

Illustration:
House at C1800 (Ruxford?) B170/107

Local Government:
1896 Valuation List B170 add/159/2

Maps and Plans:
1860 Frogmire and Creedy B170/59
    Map of Creedy Park and Frogmire in Sandford
    June 1860
    (Shows house, kitchen garden).

1819 Property of Sir J Davie B170/61
    (Splendid map of Sandford Tenements which are Lake's (Withewind) Cobleys, North Lakes, Venn, Moor Acre, Lanes (Collins) Claces and the Crofts).

1763 Manor of Ruxford etc. B170/64
    (Hand drawn and coloured. Covers land other than that immediate to Ruxford).

1860 Lands in Sandford B170/107
1773, 1793 Various B170/185
19C-20C Estate plans B170/55/1-46
1900 Estate plans B170 add 286
1906 2nd Edition OS 6" (80 chains) Sheet LV SW

Sale Catalogues:
1870 Ashridge and Coombe B227/Box 7
    Sale particulars: "Modern built residences well known Hotel and cottages 25 July 1870"

Title Deeds:
1641 Land in Urnstall 177/B/T16
1640 Lands 48/25/29
1495 Ruxford 50/11/1/4-6
1552 Ruxford 50/11/1/10

Records in the Devon Record Office, Exeter.

Parish Registers:
Pxl - 2 on microfiche 1603 -1813.
Parish and Church history.
Copy of a census of Parish of 1790

Copeland Photos:
Sandford Church 17332/5/36
House 17332/7/24
Dowrich 17332/I/130
Prowse 17332/II/87
Dira 17332/II/87
Woolsgrove 17332/8/5

Diocesan:
Basket A/3386

Roads:
1862 Maintenance agreements 1238 A/PS/6-8
Road over Cheriton to Sandford 1238A/PS9

Others:
1702 Assignment of Lease Aller Downe 1238 A/PF 16
1705-1866 Aller Downes Rentals 249B M2-6
1810 Reference to property E Aller Downe 1238 A/PF 12-13
1838 Reference in lease to property Easter Aller Downes 1238 A/PF 14-15
1839 Lease for 14 years Property Easter Aller Downes 1238 A/PF 16
1917 Sale catalogue Ash Farm 547 B/P 3307
1878-1920 North View Deeds etc. 2380c/416
1724-1931 Frostland, Endfield, Pt Borough Farms - deeds etc. 2380c/417
1664 Reynell Property in deed. 2530M/T11/1/6
1721-1754 North Creedy deeds 1926B/W/T 16/1-2
1689 North Creedy Lease 1926 B/W/L22/2
1654 Hill, West Sanford Lease 1926 B/W/C22/1
17C-19C Borough land deeds 252B APF 85
1642-1834 Bridgemans Woolsgrove Lease 34M/L19/2
1825 Papers and Auction papers Bridgemans Woolsgrove - re letting and thatching
314M/E179 - 194

1825 Tenancy agreement for Bridgemans Woolsgrove carried out on "the 26th day of April
1825 at the Newbuildings public house in the Parish of Sandford in the County of Devon
known by thte sign of the Hare and Hounds" 314M/E183A
1910 Papers re repair of footbridge Lower Davids Lane to Burnham Cotts
1238 A/PS 13-21
1705-1864 Late Burringtons Rentals 249B M 2-6
1800 Trust Deeds 314M/F46-50
1689-1735-1745 Lease - part of Downs tenement and land on Kennerly Wood
872A/PZL 33-35
1758 Claces tenement Lease 314M/L19/1
1919 Combe Estate - Sale Catalogue 547 B/P 1846

1625 Coppes Declaration of Trust 3756 B/T 1
1919 Copplestone Cross Hotel Sale Catalogue 543 B/P 3307
1705-1864 Cottons Ash Rentals of Land 249B M 2-6
1705-1864 Crediton Manor Rentals of Lands 249B/M 2-6
1679 Final concord of land in Newbuildings 872A/PZ 99
1679 Feoffment of land at Newbuildings 872A/PZ 100
1780 Reference in plan to lands Park House 1238A/PX 68
1380-1427 Remescombe Deeds 374M/T160-162
1758 Sandford Town Lease 314M/L19/1
1673 Exchange property near the Shutt 1238 A/PZ 1
1846 Woolsgrove Auction papers 314M/E186-194
1792-1801 Ref in Trave Dianes 564 M/Vol13
1919 Coombe Estate Sale 547B/P1 846
17th-19thC Dowrich Manor Deeds 252B AFF 85

Maps:
1598 Norden Terrier, copy by Rector before original given to Davie family (lost in fire)
Norden Terrier and translations Crediton 1660A add4/E1 - E3. Shows following properties: Busell (alias Benishill, Mr Copplestons); Burrage; Credie; Froste (Mr. Copplestons); Ruxford (Mr Chichester); Dedham Mill Remiscombe; Remiscombe; Cross; Wulsgrove; Frostilands; Bagburgh; Aller (Rob. Chichester); Rudge; Henstill; Dowrish (Mr Dowrish); Ashridge; Pryerton; Prowse (Mr Gaye); Downhayne; Pidsley; Bremleigh; Preston; Bremeridge; Surridge.
1675 John Ogilby's Coaching Map
1765 Dunns Map
1839 Tithe Map and Apportionment
1882 Dowrich Manor maps 253BME5
1780 Park House and lands of Sir HRDavie. Path - church gate & Back Lane 1238A/PX68
1800 Frostlands 2380C/417 and 2380C/P464
1869 Davie Estate (Property of Sir H.R. Davie) 4691M/P1
Clayfield Ireland estates 3177 add B/E13
1860 Cottages and Parsonage Lane 1660A/4/8

Other sources of references:

Brockett, A., 1977. *Devon Union List. A collection of written material relating to the County of Devon.* Exeter: The University Library.

Thorn, F. and Thorn, G., eds. 1985. *Domesday Book – Devon,* Vols 1 and 2. Exeter: Wheaton.

Devon and Cornwall Record Society volumes

From: Gover J., Mawer A., and Stenton F.M., 1932. *The Place Names of Devon, Volumes I and II.* Cambridge: Cambridge University Press.

The following buildings in the parish of Sandford are referred to. (The name of the building is followed by the date of the earliest relevant documentary material discovered).

Aller 1333
Ash Bullayne 1477
Ashmoor Barn 1621
Ashridge 1330
Bagborough 1249
Blackmoor Coombe 1333
Burridge 1330
Clampitt 1749
Dira 1765
Doddridge 1275
Downhayne 1690
Frogmuire 1261
Heathfield Cottages 1390
Kerwill Cottage 1333
North Creedy 1604
Priorton 1390
Rañscombe 1589
Pool 1333
Sturridge 1249
Swannaton 1330
West Sandford 1347
Withywood 1650
Woolsgrove 1281
Yarmley 1270

Sandford Tithe Map and Apportionment (1839)

Total Acreage of Sandford, liable to tithe: 6455

Major landowners:

John Browne Esq.	261 acres
Emily Bent	135 acres
Edward Clayfield Esq	332 acres
Sir Humphrey Davie	1268 acres
John Quicke Esq	839 acres
Tremlett	725 acres

Full list of all other owners and tenants is given.

Tithe Apportionment for Sandford 1839

From the Schedule:

The whole parish of Sandford was estimated to contain six thousand six hundred and five acres, statute measure (6,606 acres).

The quantity of land in the parish which was subject to the payment of any kind of tithes was estimated to be six thousand four hundred and fifty five acres, statute measure (6,455 acres).

The quantity of land subject to tithes in the parish, which was cultivated as arable land, was estimated to be three thousand nine hundred and nine acres, statute measure (3,909 acres).

The whole quantity of land subject to tithes within the parish cultivated as meadow or pasture land was estimated to be one thousand five hundred and eighty nine acres, statute measure (1,589 acres).

The following estimated acreage was given for land that was not cultivated:

Coppice and Plantation	332 acres
Furzeland	318 acres
Orchards and Gardens	203 acres
Moor or Common Land	104 acres

APPENDIX THREE – TABLE 4.1 COMPLETE DATABASE OF DESCRIPTIVE DATA

The collected descriptive data relating to the cob buildings in the study area and described in Chapter Four, was entered into a dBASE IV database.

134 buildings were included and 48 fields of data were entered (48 columns).

The original dBASE IV database was converted to an Excel spread-sheet for display purposes and has been printed onto the following thirty pages to form this Appendix.

	A	B	C	D	E	F	G	H	I
1	Cob Identification No	English Heritage No	Buildings Name	Grid Reference	Map Reference	Post Code	County	Parish	Location in Parish
2	COB_ID	EH_ID	NAME	GRID_REF	MAP_REF	POST_CODE	COUNTY	PARISH	LOCATION
3	101	11/74	Cross Cottage	284582/105499	SS80NW	EX17 4BZ	Devon	Sandford	East Village
4	102	11/75	Dira farmhouse	284872/105545	SS80NW	EX17 4DP	Devon	Sandford	East Village
5	103	11/76	Dira barn	284895/105560	SS80NW		Devon	Sandford	East Village
6	104	11/78	Dowrich House	282658/105070	SS80NW	EX17 4EQ	Devon	Sandford	
7	105	11/79	Dowrich Cottage	283090/104973	SS80NW	EX17 4EH	Devon	Sandford	
8	106	11/80	Dowrich Outbuilding	282671/105090	SS80NW		Devon	Sandford	
9	107	11/81	Dowrich Gatehouse	282667/105038	SS80NW		Devon	Sandford	
10	108	12/32	Downhayne Farmhouse	283767/106329	SS80NW	EX17 4DN	Devon	Sandford	Downhayne Lane
11	109	12/33	Fishers Cottage	284357/105151	SS80NW	EX17 4BY	Devon	Sandford	East Village
12	110	12/34	Dodderidge Farmhouse	283767/106329	SS80NW	EX17 4BY	Devon	Sandford	East Village
13	111	12/35	Oaklands Cottage	284193/105104	SS80NW	EX17 4BY	Devon	Sandford	East Village
14	112	12/36	Oaklands	284179/105102	SS80NW	EX17 4BY	Devon	Sandford	East Village
15	113	12/37	The Chantry	284152/105093	SS80NW	EX17 4BX	Devon	Sandford	East Village
16	114	12/38	Lillybrook Cottage	293954/105072	SS80NW	EX17 4BX	Devon	Sandford	East Village
17	115	12/52	Prowse Farmhouse	284350/105492	SS80NW	EX17 4BZ	Devon	Sandford	Prowse Lane
18	116	12/53	Prowse Barn,granary, shippon	284330/105481	SS80NW		Devon	Sandford	Prowse Lane
19	117	12/54	Prowse Cottage	284078/105515	SS80NW	EX17 4DW	Devon	Sandford	Prowse Lane
20	118	12/65	Burrowland Cottage	281860/105281	SS80NW	EX17 4EL	Devon	Sandford	Spicers
21	119	12/66	Ivy Cottage	281796/105514	SS80NW	EX17 4EL	Devon	Sandford	Spicers
22	120	12/67	Hynams	281886/105683	SS80NW	EX17 4EL	Devon	Sandford	Spicers
23	121	12/75	Swannaton Farmhouse	280946/105647	SS80NW	EX17 4EW	Devon	Sandford	Swannaton Lane
24	122	21/72	Brendon Cottage	277894/103707	SS70SE	EX17 5NZ	Devon	Sandford	
25	123	21/84	Higher Bagborough Cottages	278032/104666	SS70SE	EX17 5NY	Devon	Sandford	
26	124	21/85	Higher Furzeland Farmhouse	278410/103508	SS70SE	EX17 5NX	Devon	Sandford	
27	125	21/86	Higher Furzeland coachhouse,	278426/103459	SS70SE		Devon	Sandford	
28	126	21/87	Higher Furzeland linhay	278426/103498	SS70SE		Devon	Sandford	
29	127	21/88	Higher Woolsgrove	279297/102959	SS70SE	EX17 4PJ	Devon	Sandford	

Table 4.1 Showing Identification and Location Fields A-I (continued over)

	A	B	C	D	E	F	G	H	I
30	Cob Identification No	English Heritage No	Buildings Name	Grid Reference	Map Reference	Post Code	County	Parish	Location in Parish
31	128	21/91	Nos. 1,2 and 3 Lower Bagborou	278128/104567	SS70SE	EX17 5NZ	Devon	Sandford	
32	129	21/92	Lower Furzeland Farmhouse	278397/103561	SS70SE	EX17 5NX	Devon	Sandford	
33	130	21/93	Meadowend	279782/102301	SS70SE	EX17 4PH	Devon	Sandford	
34	131	22/01	Sandford Ash Farmhouse	277845/104305	SS70SE	EX17 5NZ	Devon	Sandford	
35	132	22/04	Sutton Farmhouse	279072/104970	SS70SE	EX17 4PS	Devon	Sandford	
36	133	22/07	Woodparks Farmhouse	277361/104824	SS70SE	EX17 5NZ	Devon	Sandford	
37	134	22/08	Woolsgrove Farmhouse	279238/102741	SS70SE	EX17 4PJ	Devon	Sandford	
38	135	22/09	Woolsgrove Farmbuildings	279220/102748	SS70SE		Devon	Sandford	
39	136	22/10	Woolsgrove barn	279208/102673	SS70SE		Devon	Sandford	
40	137	22/39	Gays Farm Cottage	278334/104580	SS70SE	EX17 5NY	Devon	Sandford	Gays Lane
41	138	22/40	Rowan Tree Cottage	279694/103716	SS70SE	EX17 4PP	Devon	Sandford	Lower New Buildi
42	139	22/41	Lower Shoplands	279696/103720	SS70SE	EX17 4PP	Devon	Sandford	Lower New Buildi
43	140	22/42	Howards Cottage	279766/103630	SS70SE	EX17 4PP	Devon	Sandford	Lower New Buildi
44	141	22/43	Ivy Cottage	279743/103600	SS70SE	EX17 4PP	Devon	Sandford	Lower New Buildi
45	142	22/44	Rosebank	279723/103567	SS70SE	EX17 4PP	Devon	Sandford	Lower New Buildi
46	143	22/45	Mortimers and Snows	279639/103542	SS70SE	EX17 4PP	Devon	Sandford	New Buildings
47	144	22/46	Staddlestones	279550/103509	SS70SE	EX17 4PW	Devon	Sandford	New Buildings
48	145	22/47	Shoplands	279617/103440	SS70SE	EX17 4PW	Devon	Sandford	New Buildings
49	146	22/48	Hare Cottage	279549103490	SS70SE	EX17 4PW	Devon	Sandford	New Buildings
50	147	22/49	Fisher Cottage	279566/103469	SS70SE	EX17 4PW	Devon	Sandford	New Buildings
51	148	22/50	The Beacon		SS70SE	EX17 4PW	Devon	Sandford	New Buildings
52	149	31/71	Bremridge	284408/104154	SS80SW	EX17 4DP	Devon	Sandford	
53	150	31/73	Combe Lancey	281977/101491	SS80SW	EX17 4EA	Devon	Sandford	
54	151	31/77	Dira Cottage	284389/104649	SS80SW	EX17 4DP	Devon	Sandford	
55	152	31/82	Dowrich House Barn	282660/104920	SS80SW		Devon	Sandford	
56	153	31/83	Dowrich Mill	282200/104850	SS80SW		Devon	Sandford	
57	154	31/89	Land Farmhouse	283220/103700	SS80SW	EX17 4BS	Devon	Sandford	
58	155	31/90	Little Combe Lancey	282167/101621	SS80SW	EX17 4EA	Devon	Sandford	

Table 4.1 Showing Identification and Location Fields A-I (continued over)

	A	B	C	D	E	F	G	H	I
59	Cob Identification No	English Heritage No	Buildings Name	Grid Reference	Map Reference	Post Code	County	Parish	Location in Parish
60	156	31/94	Middle Henstill	280867/103833	SS80SW	EX17 4ES	Devon	Sandford	
61	157	31/95	Middle Henstill Ashhouse	280871/103853	SS80SW		Devon	Sandford	
62	158	31/96	North Creedy	283179/104007	SS80SW	EX17 4EE	Devon	Sandford	
63	159	31/97	North Creedy Barn	283194/104013	SS80SW		Devon	Sandford	
64	160	31/98	Poole Cottage	283944/102026	SS80SW	EX17 4AD	Devon	Sandford	
65	161	31/99	Preston Bridge Cottage	284944/104824	SS80SW	EX17 4DA	Devon	Sandford	
66	162	32/00	Ruxford Barton	281623/102398	SS80SW	EX17 4PA	Devon	Sandford	
67	163	32/02	Sturridge	282725/103291	SS80SW	EX17 4ED	Devon	Sandford	
68	164	32/01	Sturridge Barn	282743/103270	SS80SW		Devon	Sandford	
69	165	32/05	Waterlake Cottages	282004/102605	SS80SW	EX17 4PA	Devon	Sandford	
70	166	32/06	West Henstill House	280119/103833	SS80SW	EX17 4ES	Devon	Sandford	
71	167	32/11	Bramlings Cottage	282056/104377	SS80SW	EX17 4EF	Devon	Sandford	Aller Down
72	168	32/12	The Old Forge	282032/104369	SS80SW	EX17 4EF	Devon	Sandford	Aller Down
73	169	32/13	Bussells	282053/104331	SS80SW	EX17 4EF	Devon	Sandford	Aller Down
74	170	32/14	Jadini Cottage	282852/102433	SS80SW	EX17 4NQ	Devon	Sandford	Back Lane
75	171	32/15	Saddlers	282863/102445	SS80SW	EX17 4NQ	Devon	Sandford	Back Lane
76	172	32/16	Tiny Thatch and Clovelly	282815/102503	SS80SW	EX17 4LZ	Devon	Sandford	Chapel Court
77	173	32/17	Chapel Court Cottage	282821/102496	SS80SW	EX17 4LZ	Devon	Sandford	Chapel Court
78	174	32/18	Sandford School	282915/102581	SS80SW	EX17 4NE	Devon	Sandford	Church Street
79	175	32/19	St Swithuns Church	282864/102529	SS80SW	EX17 4ND	Devon	Sandford	Church Street
80	176	32/23	Sextons Cottage	282834/102506	SS80SW	EX17 4ND	Devon	Sandford	Church Street
81	177	32/24	Congregational Church	282834/102506	SS80SW	EX17 4ND	Devon	Sandford	Church Street
82	178	32/25	Sandford Chapel Cottage	282805/102511	SS80SW	EX17 4ND	Devon	Sandford	Church Street
83	179	32/26	The Old Manse	282846/102483	SS80SW	EX17 4ND	Devon	Sandford	Church Street
84	180	32/27	The Parsonage	282885/102495	SS80SW	EX17 4ND	Devon	Sandford	Church Street
85	181	32/28	Rafters and The Stable	283216/101637	SS80SW	EX17 4EB	Devon	Sandford	Creedy Park
86	182	32/29	Kerswell	282762/101671	SS80SW	EX17 4EB	Devon	Sandford	Creedy Park
87	183	32/30	West Lodge	282743/101500	SS80SW	EX17 4EB	Devon	Sandford	Creedy Park

Table 4.1 Showing Identification and Location Fields A-I (continued over)

	A	B	C	D	E	F	G	H	I
88	Cob Identification No	English Heritage No	Buildings Name	Grid Reference	Map Reference	Post Code	County	Parish	Location in Parish
89	184	32/31	East Lodge	283931/101140	SS80SW	EX17 4AA	Devon	Sandford	Creedy Park
90	185	32/55	Park House	282956/102432	SS80SW	EX17 4NQ	Devon	Sandford	Sandford
91	186	32/56	Park House Lodge	282904/102397	SS80SW	EX17 4NQ	Devon	Sandford	Sandford
92	187	32/57	Gaters 1 & 2	282546/102555	SS80SW	EX17 4LU	Devon	Sandford	Shute
93	188	32/58	Willow Cottage and Mount Pleasar	282634/102545	SS80SW	EX17 4LT	Devon	Sandford	Shute
94	189	32/59	Nos 128 and 129	282678/102536	SS80SW	EX17 4LU	Devon	Sandford	Shute
95	190	32/60	Town Barton	282634/102481	SS80SW	EX17 4LS	Devon	Sandford	Shute
96	191	32/61	Town Barton Walls	282645/102523	SS80SW		Devon	Sandford	Shute
97	192	32/62	Town Barton Linhay	282595/102527	SS80SW		Devon	Sandford	Shute
98	193	32/63	Barton Court	282666/102515	SS80SW	EX17 4LS	Devon	Sandford	Shute
99	194	32/64	Parish Pump	282600/102500	SS80SW		Devon	Sandford	Shute
100	195	32/68	Star House	282715/102502	SS80SW	EX17 4LR	Devon	Sandford	The Square
101	196	32/69	Star House Linhay	282713/102514	SS80SW		Devon	Sandford	The Square
102	197	32/70	2 Prospect Place	282725/102517	SS80SW	EX17 4LR	Devon	Sandford	The Square
103	198	32/71	Lamb Inn	282799/102484	SS80SW	EX17 4LW	Devon	Sandford	The Square
104	199	32/72	Fairview and No 24	282796/102463	SS80SW	EX17 4LW	Devon	Sandford	The Square
105	200	32/73	The Old Smithy	282776/102427	SS80SW	EX17 4LW	Devon	Sandford	The Square
106	201	32/74	Withywinds	28235/103730	SS80SW	EX17 4EF	Devon	Sandford	Stones Hill
107	202	32/76	Lower Creedy Bridge	283900/102300	SS80SW		Devon	Sandford	Thornhedges Lan
108	203	32/77	Hele House	281200/102770	SS80SW	EX17 4PG	Devon	Sandford	West Sandford
109	204	32/78	Hele House Summerhouse	281224/102767	SS80SW		Devon	Sandford	West Sandford
110	205	32/79	Wayside Cottage	281265/102600	SS80SW	EX17 4PG	Devon	Sandford	West Sandford
111	206	32/80	Yarmleigh Farmhouse	280667/104505	SS80SW	EX17 4EW	Devon	Sandford	Yarmleigh Lane
112	207	32/9F3	Milestone	282000/104500	SS80SW		Devon	Sandford	Aller Down
113	208	32/94	Ivy Cottage	284140/104300	SS80SW	EX17 4EL	Devon	Sandford	
114	209	32/95	Mooracre	283597/102419	SS80SW	EX17 4BR	Devon	Sandford	
115	210	32/96	Northlakes	283536/103148	SS80SW	EX17 4BS	Devon	Sandford	
116	211	32/97	Rudge House 10 & 11	283050/102104	SS80SW	EX17 4NP	Devon	Sandford	Mill Lane
117	212	42/51	Whiterose	285178/104554	SS80SW	EX17 4DA	Devon	Sandford	Preston Lane

Table 4.1 Showing Identification and Location Fields A-I (continued over)

	A	B	C	D	E	F	G	H	I
118	Cob Identification No	English Heritage No	Buildings Name	Grid Reference	Map Reference	Post Code	County	Parish	Location in Parish
119	213		Bawdenhayes	282508/103345	SS80SW		Devon	Sandford	
120	214		Clampitt	282209/103839	SS80SW		Devon	Sandford	
121	215		Doggetsbeer	281888/104541	SS80SW		Devon	Sandford	
122	216		Priorton Barton	283540/104945	SS80SW		Devon	Sandford	
123	217		Cross Barton	280610/102276	SS80SW		Devon	Sandford	
124	218		Aller Barton	281051/102015	SS80SW		Devon	Sandford	
125	219		Ruxford Barn	281701/102351	SS80SW		Devon	Sandford	
126	220		Frogmire	282575/101514	SS80SW		Devon	Sandford	
127	221		Venn	283629/102628	SS80SW		Devon	Sandford	
128	222		Long Barn	284100/101664	SS80SW		Devon	Sandford	
129	223		Creedy Park	283211/101664	SS80SW		Devon	Sandford	
130	224		West Sandford	280953/102845	SS80SW		Devon	Sandford	
131	225		Burridge	281574/105543	SS80NW		Devon	Sandford	
132	226		West Pidsley	280991/105154	SS80NW		Devon	Sandford	
133	227		East Pidsley	281462/105154	SS80NW		Devon	Sandford	
134	228		Ashridge	282478/106201	SS80NW		Devon	Sandford	
135	229		Yelland	282177/105581	SS80NW		Devon	Sandford	
136	230		Spicers	281940/104820	SS80SW		Devon	Sandford	
137	231		Swelthills	279085/103614	SS70SE		Devon	Sandford	
138	232		Frostland	278767/104070	SS70SE		Devon	Sandford	
139	233		Sandford Ash	277807/104307	SS70SE		Devon	Sandford	
140	234		Ash Bullayne	277332/104288	SS70SE		Devon	Sandford	

Table 4.1 Showing Identification and Location Fields A-I (continued over)

	J	K	L	M	N	O	P	Q	R
1	Grade	Aspect from Front	Nos. Of Storeys	Current Type	Current Use	Original Type	Original Use	Original Date	Additions Date
2	GRADE	ASPECT	STOREYS	CURR_TYPE	CURR_USE	ORIG_TYPE	ORIG_USE	ORIG_DATE	ADD_DATE
3	Two	southwest	Two	Cottage	DM	Farmhouse	DM	C17	Late C19
4	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C17	LateC18
5	Two	east	One	Barn	AG	Barn	AG	C17	
6	Two	southeast	Two	Farmhouse	DM	Manor House	DM	C16	C19, C20
7	Two	northwest	Two	House	DM	Cottages	DM	C18	C19
8	Two	southeast	Two	House	DM	Kitchen bakehouse	AY	C15	C19; C20
9	Two		One	Gatehouse	AY	Gatehouse	LW	C16	C19
10	Two	southeast	Two	Farmhouse	DM	Farmhouse & Cottage	DM	C19	C20
11	Two	south	Two	Cottages	DM	Cottages	DM	C18	C20
12	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C16	Late C19
13	Two	south	Two	Cottage	DM	Cottage	DM	C18	C20
14	Two	south	Two	House	DM	Cottages	DM	C17	Late C19
15	Two	south	Two	House	DM	Cottages	DM	C16	C20
16	Two	south	Two	House	DM	Farmhouse	DM	C17	C18; C20
17	Two Star	south	Two	Farmhouse	DM	Manor House	DM	C15	C16; C20
18	Two	west	One	Barn	AG	Barn, granary, shippon	AG	C16	C19
19	Two	southeast	Two	Cottage	DM	Cottage	DM	C17	C20
20	Two	southwest	Two	House	DM	Farmhouse	DM	C18	C20
21	Two	south	Two	Cottage	DM	Cottage	DM	C19	C20
22	Two	east	Two	House	DM	Farmhouse	DM	C16	C18,C20
23	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C16	C17,C19
24	Two	southeast	Two	Cottage	DM	Two cottages	DM	C18	C20
25	Two	southeast	Two	Two Cottages	DM	Two Cottages	DM	C18	C20
26	Two Star	southeast	Two	Farmhouse	DM	Farmhouse	DM	C16	C17, C19
27	Two	west	Two	Coach house	AL	Outbuildings, stables	AL	C17	C18
28	Two	north	One	Linhay	AG	Linhay	AG	C17	C18
29	Two	southwest	Two	House	DM	Farmhouse	DM	C17	C19

Table 4.1 (continued)
Showing Architectural Characteristics Fields J-R (continued over)

	J	K	L	M	N	O	P	Q	R
30	Grade	Aspect from Front	Nos of Storeys	Current Type	Current Use	Original Type	Original use	Original Date	Additions Date
31	Two	southeast	Two	Cottages	DM	Farmhouse	DM	C16	C19
32	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C17	C19,C20
33	Two	south	Two	Cottage	DM	Cottage	DM	C17	C20
34	Two	southeast	Two	Farmhouse	DM	Farmhouse	DM	C16	C19
35	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C16	C19
36	Two	southeast	Two	Farmhouse	DM	Farmhouse	DM	C17	C20
37	Two	southeast	Two	Farmhouse	DM	Farmhouse	DM	C16	C19
38	Two		Two	Farmbuildings	AG	Farmhuildings	AG	C17	C19
39	Two	east	One	Barn	AG	Barn	AG	C17	
40	Two	south	Two	Cottage	DM	Cottage	DM	C18	C20
41	Two	southeast	Two	Cottage	DM	Farmhouse	DM	C17	C19
42	Two	southeast	Two	Cottage	DM	Farmhouse	DM	C17	C19, C20
43	Two	southeast	Two	Cottage	DM	Cottage	DM	C18	C19, C20
44	Two	southeast	Two	House	DM	Cottages	DM	C18	C19, C20
45	Two	southeast	Two	House	DM	Farmhouse	DM	C16	C19, C20
46	Two	southeast	Two	Cottages	DM	Cottages	DM	C18	C19, C20
47	Two	southwest	Two	Cottage	DM	House (part of)	DM	C17	C19
48	Two	southwest	Two	Cottage	DM	Cottage	DM	C17	C19
49	Two	northeast	Two	House	DM	Inn	RS	C19	C20
50	Two	northeast	Two	Cottage	DM	Cottages	DM	C19	
51	Two	southeast	Two	Cottage	DM	Cottage	DM	C19	C20
52	Two Star	southwest	Two	Farmhouse	DM	Farmhouse	DM	C16	C17, C19
53	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C15	C19, C20
54	Two	east	Two	Cottage	DM	Cottage	DM	C18	C20
55	Two	northeast	One	Barn	AG	Barn	AG	C16	C19
56	Two	east	Two	Mill	AG	Mill	AG	C17	C19
57	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C17	C19
58	Two	west	Two	House	DM	Farmhouse	DM	C16	C17,C19,C20

Table 4.1 (continued)
Showing Architectural Characteristics Fields J-R (continued over)

	J	K	L	M	N	O	P	Q	R
59	Grade	Aspect from Front	Nos of Storeys	Current Type	Current Use	Original Type	Original use	Original Date	Additions Date
60	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C17	C19
61	Two		One	Ashhouse	AY	Ashhouse	AY	C19	
62	Two	southeast	Two	Farmhouse	DM	Farmhouse	DM	C18	C19, C20
63	Two	southeast	Two	Barn	AG	Barn	AG	C19	
64	Two	southeast	Two	House	DM	Farmhouse	DM	C18	C20
65	Two	southeast	Two	Cottage	DM	Cottage	DM	C19	C20
66	Two	south	Two	Farmhouse	DM	Manor House	DM	C16	C17, C19
67	Two	south	Two	Farmhouse	DM	Farmhouse	DM	C16	C17, C19
68	Two	south	One	Barn	AG	Barn	AG	C16	C18,C19
69	Two	south	Two	Cottages	DM	Cottages	DM	C18	C19, C20
70	Two	southeast	Two	House	DM	Farmhouse	DM	C16	C20
71	Two	east	Two	Cottage	DM	Cottage	DM	C19	C20
72	Two	east	Two	House	DM	Cottage and Forge	DM, AG	C18	C19, C20
73	Two	southwest	Two	House	DM	Farmhouse & barn	DM, AG	C17	C18, C19, C2
74	Two	southeast	Two	Cottage	DM	Cottage	DM	C18	C20
75	Two	southeast	Two	Cottages	DM	Cottages	DM	C18	C20
76	Two	west	Two	House	DM	Cottages	DM	C17	C19, C20
77	Two	west	Two	Cottage	DM	Cottage	DM	C19	C20
78	Two	west	One	School	ED	School	ED	C19	C20
79	One			Church	RL	Chapel of Ease	RL	C11	C19
80	Two	southeast	Two	Cottage	DM	Cottage and store	DM	C19	C19
81	Two		One	Church	RL	Church	RL	C19	
82	Two	northwest	Two	House	DM	School	ED	C19	
83	Two	northwest	Two	House	DM	House	DM	C19	
84	Two	northeast	Two	Parsonage	DM	Parsonage	DM	C19	
85	Two	south	Two	Houses	DM	Stables	AL	C18	C20
86	Two	southeast	One	Cottage	DM	Cottage	DM	C19	
87	Two	west	One	House	DM	Lodge	DM	C19	C20

Table 4.1 (continued)
Showing Architectural Characteristics Fields J-R (continued over)

	J	K	L	M	N	O	P	Q	R
88	Grade	Aspect from Front	Nos of Storeys	Current Type	Current Use	Original Type	Original use	Original Date	Additions Date
89	Two	southeast	One	House	DM	Lodge	DM	C19	C20
90	Two	south	Two	House	DM	House	DM	C17	C19,C20
91	Two	north	One	House	DM	Lodge	DM	C19	
92	Two	south	Two	Houses	DM	Farmhouse	DM	C16	C19, C20
93	Two	east	Two	Cottages	DM	Cottages	DM	C19	C20
94	Two	south	Two	Cottages	DM	House	DM	C16	C19
95	Two	east	Two	House	DM	House	DM	C16	C19
96	Two			Walls and gate		Walls and gateposts		C16	C19
97	Two	south	One	Linhay	AG	Linhay	AG	C17	
98	Two Star	west	Two	House	DM	Kitchen and services	DM	C16	C20
99	Two			Pump		Pump		C19	C20
100	Two	northeast	Two	House	DM	House	DM	C19	
101	Two	southwest	One	Linhay	AG	Linhay	AG	C18	C19
102	Two	south	Two	House	DM	House	DM	C19	
103	Two	south	Two	Public House	CL	House	DM	C16	C19, C20
104	Two	south	Two	Houses	DM	Houses	DM	C19	
105	Two	northeast	Two	House	DM	House and shop	DM	C17	C19
106	Two	south	Two	House	DM	Cottages	DM	C18	C20
107	Two			Bridge		Bridge		C18	
108	Two	southeast	Two	House	DM	House	DM	C19	C20
109	Two	southeast	One	Summerhouse	AY	Summerhouse	AY	C19	
110	Two	south	Two	House	DM	House	DM	C17	C19, C20
111	Two	southeast	Two	Farmhouse	DM	Farmhouse	DM	C17	C20
112	Two			Milestone		Milestone		C18	
113	Two		Two	House	DM	House	DM	C16	C19
114	Two		Two	Farmhouse	DM	Farmhouse	DM	C18	C19
115	Two	south	Two	House	DM	Farmhouse	DM	C17	C19
116	Two	east	Two	House	DM	Cottages	DM	C16	C19
117	Two Star	south	Two	Farmhouse	DM	Farmhouse	DM	C16	C17,C19,C20

Table 4.1 (continued)

Showing Architectural Characteristics Fields J-R (continued over)

	J	K	L	M	N	O	P	Q	R
118	Grade	Aspect from Front	Nos of Storeys	Current Type	Current Use	Original Type	Original use	Original Date	Additions Date
119	NL								
120	NL								
121	NL			Farmhouse	DM	Farmhouse	DM		
122	NL								
123	NL								
124	NL			Farmhouse	DM	Farmhouse	DM		
125	NL			Barn	AG	Barn	AG		
126	NL			Farmhouse	DM	Farmhouse	DM		
127	NL			Farmhouse	DM	Farmhouse	DM		
128	NL								
129	NL			Mansion	DM	Flats	DM		
130	NL								
131	NL								
132	NL								
133	NL								
134	NL								
135	NL								
136	NL								
137	NL								
138	NL								
139	NL								
140	NL								

Table 4.1 (continued)
Showing Architectural Characteristics Fields J-R (continued over)

	S	T	U	V	W	X	Y	Z	AA	AB
1	Wall Material	Stack Material	Roofing Material	Roof Shape	Original Plan	Cross Wing Present	Door Type	Window Type	Floor Type	Stair Type
2	WALL_MATER	STACK_MATE	ROOF_MATER	ROOF_SHAPE	ORIG_PLAN	CROSS_WING	DOOR_TYPE	WINDOW_TYP	FLOOR_TYPE	STAIR_TYPE
3	Cob	Cob, rubblestone	thatch	gable	L shaped					
4	rubblestone	rubblestone	slate	gable	E shaped	yes	C17 moulded	sash, casement	flags	dog leg
5	Cob		thatch	half-hipped, gable						
6	rubblestone	rubblestone	slate	gable	3 room, cross passage	yes	C16 ashlar	sash, casement		
7	Cob	rubblestone, brick	slate		2 and 1 room cottages			casement		
8	Cob	rubblestone, brick	slate	gable	1 room			C19 casement		
9	rubblestone									
10	rubblestone	rubblestone, brick	slate	gable	2 room and 1 room		panel	sash		
11	Cob	rubblestone, brick	thatch	hipped	2, 2 room cottages			casement		
12	Cob	rubblestone, brick	slate	gable	3 room		panel	casement		
13	Cob	rubblestone, brick	thatch		1 room			casement		
14	Cob	rubblestone, brick	thatch		2, 2 room cottages			sash		
15	Cob	rubblestone, brick	thatch		3 room, cross passage		plank	casement		winder
16	Cob	rubblestone, brick	thatch		3 room, cross passage			casement		
17	Cob	rubblestone, brick	thatch	hipped, gable	3 room, cross passage	yes	C15 studded oak plank		stone	
18	Cob		corr. iron	half hipped						
19	Cob	Cob, rubblestone	thatch	gable	2 room			casement		
20	Cob	Cob, rubblestone	thatch	hipped, half hipped	2 room, cross passage			casement		
21	Cob	Cob, rubblestone	thatch	gable	2 room			casement		
22	Cob	rubblestone, brick	thatch	gable	3 room	yes		C18, C19,C20		winder
23	Cob	rubblestone, brick	slate	gable	3 room, cross passage		C17 frame with scrolls	C20		
24	Cob	Cob, rubblestone	thatch	half hipped, gable	2, 1 room cottages			C20 casement		
25	Cob	rubblestone, brick	thatch	hipped	2, 2 room cottages			C20 casement		
26	Cob	Cob, stone	thatch	gable	3 room, cross passage		chamfered frames	C17, C19, C20		C17 straight, wind
27	Cob		corr.iron (was thatch)	half hipped						
28	Cob		corr.iron (was thatch)							
29	Cob	rubblestone, brick	thatch		3 room			C19		

Table 4.1 (continued)
Showing Architectural Characteristics Fields S-AB (continued over)

	S	T	U	V	W	X	Y	Z	AA	AB
30	Wall Material	Chimney Stack Material	Roofing Material	Roof Shape	Original Plan	Cross Wing Present	Door Type	Window Type	Floor Type	Stair Type
31	Cob		thatch	hipped, half hipped	3 room, cross passage		C16 moulded	C19, C20		stair turret
32	Cob	rubblestone, brick	thatch	gable	L shaped			C19, C20		
33	Cob	rubblestone	thatch	gable	2 room			C19, C20		
34	Cob	rubblestone, brick	asbestos (was thatch)	hipped	3 room, cross passage		C19, Tuscan doorcase	C19		
35	Cob	rubblestone, brick	thatch	hipped	central staircase	yes	doorcase with panelled	C16 mullions		
36	Cob	rubblestone, brick	thatch		2 room, cross passage			C20		
37	Cob	rubblestone, brick	tile (was thatch)	gable	3 room, cross passage		C19, Tuscan doorcase	C19		
38	Cob	rubblestone	slate (was thatch)	gable			C17, carriageway door			
39	Cob		corr.iron (was thatch)	half hipped						
40	Cob	Cob	thatch	gable	2 room			C19		
41	Cob	rubblestone, brick	thatch	gable				C19, C20		
42	Cob	rubblestone	thatch	hipped	2 room, cross passage			C20		
43	Cob	Cob, rubblestone	thatch	half hipped, gable	1 room			C19, C20		
44	Cob	cob, rubblestone	thatch	hipped, gable	2 room, 1 room			C19, C20		
45	Cob	rubblestone, brick	thatch	half hipped	3 room, cross passage			C19, C20		
46	Cob	rubblestone, brick	thatch	hipped, gable	2 room, cross passage			C19, C20		
47	Cob	rubblestone, brick	thatch	half hipped				C19, C20		
48	brick	brick	thatch	hipped	L shaped		C19 6panel	C19		
49	Cob	rubblestone, brick	thatch		T shaped	yes	Early C19	C19		
50	Cob	rubblestone, brick	thatch	hipped, half hipped	2, 2 room cottages			C19		
51	Cob	rubblestone, brick	thatch		L shaped			C19, C20		
52	Cob	stone, brick	slate (was thatch)		3 room, cross passage		C17 oak studded	C19, C20		C17 stair block
53	Cob	rubblestone, brick	thatch	hipped, gable	3 room, cross passage		C19 plank	C20		C17 stair block
54	Cob	rubblestone, brick	thatch	hipped, half hipped				C19,C20		
55	Cob		slate	gable				C17		
56	Cob		slate	gable						
57	Cob	rubblestone, brick	thatch		2 room, lobby entrance			C19		
58	Cob	rubblestone, brick	thatch	gable	3 room, cross passage			C20		

Table 4.1 (continued)
Showing Architectural Characteristics Fields S-AB (continued over)

	S	T	U	V	W	X	Y	Z	AA	AB
59	Wall Material	Chimney Stack Material	Roofing Material	Roof Shape	Original Plan	Cross Wing Present	Door Type	Window Type	Floor Type	Stair Type
60	Cob	rubblestone, brick	thatch	hipped	3 room, cross passage		C19 6 panel	C19		
61	Cob	Cob	thatch	conical			plank			
62	Cob	rubblestone, brick	thatch	hipped	2 room, double depth		6 panel	C19		
63	rubblestone		slate	hipped						
64	Cob	Cob, rubblestone	thatch	hipped				C19, C20		
65	Cob	rubblestone, brick	thatch	hipped, gable	2 room			C19		
66	Cob	stone, brick	slate	gable	3 room, cross passage	yes	Early C17 studded	C18, C19, C20		
67	Cob	rubblestone, brick	asbestos (was thatch)	gable	3 room, cross passage			C19		
68	Cob		corr.iron							
69	Cob	Cob, rubblestone	thatch	hipped	2 room, mirror plan			C19, C20		
70	Cob	stone, brick	thatch	half hipped, gable	3 room, cross passage			C19, C20		
71	Cob	Cob, rubblestone	thatch	hipped, gable	1 room, double depth			C20		
72	Cob	Cob, brick	thatch	hipped	2 room			C19, C20		
73	Cob			half hipped	2 room			C20		
74	Cob	Cob, rubblestone	thatch	gable	2 room					
75	Cob	rubblestone, brick	thatch	gable	1 room and 2 room			C19, C20		
76	Cob	Cob, rubbl;estone	thatch	hipped, gable	2 room and 2 room			C19, C20		
77	Cob	rubblestone, brick	thatch	gable	1 room, double depth			C20		
78	Cob		slate	gable	3 room			C19		
79	rubblestone		slate							
80	rubblestone	brick	slate	gable			plank	timber mullion,		
81	stone	stone	slate	gable						
82	rubblestone	brick	slate	gable	2 room, double depth		studded plank	mullion		
83	rubblestone	rubblestone, brick	slate	gable	2 room, central stair		6 panel	16 pane sashes		
84	rubblestone	rubblestone, brick	slate	hipped	4 room, central stair		8 panel with fanlight	16 pane sashes		
85	brick		slate				C20	12 pane sashes,		
86	Cob	rubblestone, brick	thatch	pyramid	2 room, double depth			mullion and tra		
87	rubblestone	rubblestone, brick	slate	gable	2 room		6 panel	12 pane sashes		

Table 4.1 (continued)
Showing Architectural Characteristics Fields S-AB (continued over)

	S	T	U	V	W	X	Y	Z	AA	AB
88	Wall Material	Chimney Stack Material	Roofing Material	Roof Shape	Original Plan	Cross Wing Present	Door Type	Window Type	Floor Type	Stair Type
89	rubblestone	rubblestone, brick	slate	gable	2 room		6 panel	12 pane sashes		
90	Cob	rubblestone, brick	slate	table	2 room, double depth		6 panel	16 pane, 12 pane		central
91	stone	stone, brick	slate	hipped, gable	2 room		4 panel	moulded mullion		
92	Cob	rubllestone, brick	thatch	hipped	T shaped			C19, C20 caseme		
93	Cob	rubblestone, brick	thatch	hipped, gable	2 room			C20 casements		
94	Cob	stone, brick	thatch		3 room, cross passage			C19,C20 casemen		
95	stone	stone,. brick	slate	hipped, gable	2 room, cross passage		6 panel	C16, C17 mullion		central
96	Cob		slate							
97	Cob		thatch	hipped						
98	rubblestone	stone	thatch	gable	2 room			C16, C17 mullion		
99	rubblestone									
100	Cob	rubblestone, brick	slate	hipped	2 room, double depth			12 pane sashes		
101	Cob		slate				studded with strap hinge			
102	stone	stone, brick	slate	gable	2 room		plank	timber mullion		
103	rubblestone	stone	slate (was thatch)		3 room, cross passage		6 panel	C19 tripartite		
104	rubblestone	rubblestone, brick	slate	gable	2 room, 1 room		6 panel	12 pane sashes		
105	Cob	Cob	thatch	gable	2 room, cross passage		plank	C19 3 light cas		
106	Cob	rubblestone, brick	thatch	hipped	2 room, 1 room			C20		
107		rubblestone, brick								
108	rubblestone	rubblestones, bric	slate	half hipped	2 room, double depth		4 panel with overlight	16 pane, 12 pa		central, open stri
109	rubblestone		slate	pyramid	1 room					
110	Cob	rubblestone, brick	thatch	gable	2 room, cross passage		plank	C19, C20 casement		
111	Cob	stone, brick	thatch		3 room, cross passage			C17, 2 light mullion		
112		stone								
113	Cob	Cob	slate	gable	3 room, lobby entrance		plank	C19,C29 casement		
114	Cob	Cob, rubblestone	thatch	gable	2 room, cross passage			C19 casement		
115	Cob	Cob, rubblestone	thatch	hipped, gable	3 room, cross passage			C19,C20 casement		
116	Cob	sandstone ashlar,	asbestos (was thatch)		3 room, cross passage					
117	Cob	stone, brick	thatch	hipped, gable	3 room, cross passage			C19,C20 casement		turret

Table 4.1 (continued)
Showing Architectural Characteristics Fields S-AB (continued over)

	S	T	U	V	W	X	Y	Z	AA	AB
118	Wall Material	Stack Material	Roofing Material	Roof Shape	Original Plan	Cross Wing Present	Door Type	Window Type	Floor Type	Stair Type
119										
120										
121	Cob									
122										
123										
124										
125	Cob									
126	Cob									
127										
128										
129										
130										
131										
132										
133										
134										
135										
136										
137										
138										
139										
140										

Table 4.1 (continued)
Showing Architectural Characteristics Fields S-AB (continued over)

	AC	AD	AE	AF	AG	AH	AI	AJ	AK
1	Roof Structure	Nos of Roof Bays	Moulding Type	Purlin Type	Stack Position	Beam Type	Plasterwork Type	Joinery Type	Render Type
2	ROOF_STRUC	ROOF_BAYS	MOULDING	PURLIN_TYP	STACK_TYPE	BEAM_TYPES	PLASTER	JOINERY	RENDER
3					axial, lateral, end	double ovolo; chamf. with scroll stops			
4	A frame, collar		ovolo, chamfer		lateral, end	chamf. with step stops	cornices, friezes	dovetail lapjoint	
5	A frame, collar	five						pegged lapjoint	Plaster
6	jointed cruck	four, four		butt	lateral			sidepegged, dovetail lapjoint	
7					lateral, end				
8	jointed cruck		ogee	butt		chamfered		sidepegged	Plaster
9									
10					axial, end				
11					end	plain chamfer, cross and axial			Plaster
12					lateral, end				
13									
14	A frame, collar	two, two				chamfer with scroll stops; axial			
15	jointed cruck	two, two	ovolo			chamfer with step stops, chamfer with scroll			Plaster
16	truss				end, central	chamfered axial with step stops			
17	jointed cruck	four	Tudor rose	butt	lateral, end	chamfered, runout stops, moulded and plain		sidepegged	Plaster
18	jointed cruck	three						sidepegged	Plaster
19						axial with straight cut stops			Plaster
20					axial, lateral				
21									Plaster
22	common rafter				lateral, end	chamfered with step stopped cross			
23	jointed cruck	four			lateral, end	axial, chamfered with runout stops	cornice	sidepegged	roughcast
24									
25									
26	A frame, collar				lateral			pegged lapjoints to collar	
27	A frame, collar	seven						pegged lapjoints to collar	
28	A frame							pegged lapjoints, tusk tenons	
29									Plaster

Table 4.1 (continued)

Showing Architectural Characteristics Fields AC-AK (continued over)

	AC	AD	AE	AF	AG	AH	AI	AJ	AK
30	Roof Structure	Nos of Roof Bays	Moulding Type	Purling Type	Stack Position	Beam Type	Plasterwork Type	Joiner Type	Render Type
31					axial, end	moulded axial			
32					end				Plaster
33						chamfered crossbeam with straight cut stops			
34	A frame, collar				axial, end	chamfered with step stops		pegged lapjoints	
35	king post		ovolo		lateral, end				
36					end	chamfered crossbeam with runout stops			Plaster
37	jointed cruck	seven			end			side pegged	Plaster
38	A frame, collar	six						pegged lapjoints to collar	Plaster
39	A frame	five						pegged lapjoints to collar	
40					end				
41			double ovolo		lateral, end	cross beam with double ovolo, leaf design			
42					lateral, end				Plaster
43					end				Plaster
44					axial end	plain chamfered			Plaster
45					lateral				
46					end				
47					axial, lateral				Plaster
48					axial				
49	A frame, collar				axial, lateral, end			nailed lapjoints to collars	Plaster
50					axial, lateral				
51					lateral, end				
52	jointed cruck	six	ovolo, chamfer	butt	lateral	cross beam, chamfer with step stops	ovolo, bolection	sidepegged, carved bosses	
53	jointed cruck				axial, lateral	cross beams		sidepegged, jointed cruck	Plaster
54					lateral				Plaster
55	jointed cruck		ogee, ovolo					sidepegged, jointed cruck	
56	truss								
57	A frame				axial	chamfered crossbeams, scroll stops			
58					axial, end	chamfered cross beams, facetted stops			

Table 4.1 (continued)
Showing Architectural Characteristics Fields AC-AK (continued over)

	AC	AD	AE	AF	AG	AH	AI	AJ	AK
59	Roof Structure	Nos of Roof Bays	Moulding Type	Purlin Type	Stack Position	Beam Type	Plasterwork Type	Joinery Type	Render Type
60	A frame, collar				axial, lateral, end	plain chamfered		pegged lapjoints to collar	Plaster
61									
62					end				Plaster
63	king post	six							
64					lateral				Plaster
65					end				Plaster
66	A frame, collar		ovolo		axial, lateral		strapwork	mortise and tenon collars	Plaster
67					lateral, end				Plaster
68	jointed cruck	three						sidepegged trusses	
69					end				Plaster
70					lateral				Plaster
71					end				Plaster
72					lateral, end				Plaster
73	A frame, collar					chamfered cross beam, scroll stopped		dovetail lapjointed collar	Plaster
74									Plaster
75					end				Plaster
76					lateral, end				Plaster
77					end				Plaster
78									Stucco
79									
80					end				
81									
82					end				
83					lateral				
84					axial				Pebble dash
85									Stucco
86			ovolo		central		coved cornice		Plaster
87					end				Plaster

Table 4.1 (continued)
Showing Architectural Characteristics Fields AC-AK (continued over)

	AC	AD	AE	AF	AG	AH	AI	AJ	AK
88	Roof Structure	Nos of Roof Bays	Moulding Type	Purlin Type	Stack Position	Beam Type	Plasterwork Type	Joinery Type	Render Type
89					end				Plaster
90									Plaster
91									Plaster
92	jointed cruck				axial, lateral	chamfered crossbeams			Plaster
93					lateral, end				Plaster
94			ovolo		lateral, end	bead beam			Plaster
95			ovolo		lateral				
96									
97	A frame, collar							pegged lapjointed to collar	
98			ovolo, chamfer		lateral, end				
99									
100									Plaster
101	king post							tusk tenon	Plaster
102					end				
103					lateral				
104					axial, end				Plaster
105					end	chamfered crossbeam with run out stops			Plaster
106					lateral, end	plain chamfered			Plaster
107									
108					end				Plaster
109							cornice		Plaster
110	A frame, collar				lateral, end	chamfered crossbeams with scroll stops		pegged lapjointed collars	Plaster
111			double ovolo		lateral, end	double ovolo moulded with scroll stops			
112									
113					end				Plaster
114					end				Plaster
115					axial, end	chamfered crossbeams			Plaster
116					lateral, end				Plaster
117	jointed cruck				axial	chamfered axial beam with pyramid stops		side pegged, jointed cruck	Plaster

Table 4.1 (continued)
Showing Architectural Characteristics Fields AC-AK (continued over)

	AC	AD	AE	AF	AG	AH	AI	AJ	AK
118	Roof Structure	Nos of Roof Bays	Moulding Type	Purlin Type	Stack Position	Beam Type	Plasterwork Type	Joinery Type	Render Type
119									
120									
121									
122									
123									
124									
125									
126									
127									
128									
129									
130									
131									
132									
133									
134									
135									
136									
137									
138									
139									
140									

Table 4.1 (continued)
Showing Architectural Characteristics Fields AC-AK (continued over)

	AL	AM	AN	AO	AP	AQ	AR	AS
1	Included in SMR	Documentary Refs.	Prebendary Farm	On Nordern Map	On Other Maps	Owner in 1839	Acres in 1839	Ref. In Place Names
2	SMR NO	DOC REFS	PREB FARM	NORDERN	MAPS	OWNER 1839	ACRES 1839	G,M&S
3						Davie		
4		18C		Yes		Davie	213	Yes
5						Davie		Yes
6	Yes	13C		Yes	19C	Clayfield	243	Yes
7						Clayfield		
8						Clayfield		
9						Clayfield		
10	Yes	10C		Yes				Yes
11								
12		13C				Horwell	56	Yes
13								
14								
15								
16		13C		Yes		Davie		Yes
17	Yes					Davie	211	
18						Davie		
19								
20	Yes					Crediton Trustees	22	
21								
22						Crediton Trustees		
23	Yes	14C		Yes		Lake	125	
24						Pope		
25						Kelland	59	
26		14C				Gregory	79	Yes
27						Gregory		
28						Gregory		
29						Luxmore	30	

Table 4.1 (continued) Showing Historic Fields AL-AS (continued over)

	AL	AM	AN	AO	AP	AQ	AR	AS
30	Included in SMR	Documentary References	Prebendary Farm	Included on Nordern Map	Included on other Maps	Owner in 1839	Acres in 1839	Ref. In Place Names
31		13C		Yes		Norrish	116	Yes
32						Norrish	44	
33						Norrish	46	
34								
35						Tremlett	209	
36						Pope	38	
37	Yes	13C				Lane	99	Yes
38	yes					Lane		
39						Lane		
40						Norrish	34	
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52	Yes	14C		Yes		Malhuish	101	Yes
53	Yes	13C				Davie	191	Yes
54								
55								
56								
57						Read	39	
58								

Table 4.1 (continued) Showing Historic Fields AL-AS (continued over)

	AL	AM	AN	AO	AP	AQ	AR	AS
59	Included in SMR	Documentary References	Prebendary Farm	Included on Nordern Map	Included on other Maps	Owner in 1839	Acres in 1839	Ref. In Place Names
60	Yes	10C, 13C	Yes	Yes		Northcote	200	Yes
61								
62		16C		Yes				Yes
63								
64						Davie		
65								
66	Yes	10C, 13C		Yes	18C	Davie	315	Yes
67		13C		Yes		Davie	70	Yes
68								
69								
70								
71								
72								
73				Yes		Read	12	
74								
75								
76								
77								
78						Davie		
79								
80								
81								
82								
83								
84								
85								
86								
87								

Table 4.1 (continued) Showing Historic Fields AL-AS (continued over)

	AL	AM	AN	AO	AP	AQ	AR	AS
88	Included in SMR	Documentary References	Prebendary Farm	Included on Nordern Map	Included on other Maps	Owner in 1839	Acres in 1839	Ref. In Place Names
89								
90		18C			18C			
91								
92						Hutton	60	
93								
94								
95								
96								
97								
98								
99								
100								
101								
102								
103								
104								
105								
106		17C			19C	Davie	61	Yes
107								
108		14C						Yes
109								
110								
111		13C				Bent	134	Yes
112								
113		C16						
114					19C	Davie	26	
115					19C	Davie		
116								
117		C17	Yes	Yes				

Table 4.1 (continued) Showing Historic Fields AL-AS (continued over)

	AL	AM	AN	AO	AP	AQ	AR	AS
118	Included in SMR	Documentary References	Prebendary Farm	Included on Nordern Map	Included on other Maps	Owner in 1839	Acres in 1839	Ref. In Place Names
119		C17				Davie	38	
120		C18				Davie	32	
121		C14						
122		C14		Yes		Tremlett	330	
123		C14	Yes	Yes		Quicke	106	
124		C14	Yes	Yes		Quicke	117	
125				Yes		Davie		
126		C13		Yes	C19	Davie	98	
127		C14			C19	Davie		
128		C15	Yes			Davie	138	
129		C18			C19	Davie	24	
130		C14				Quicke		
131		C10		Yes		Davie	200	
132	Yes	C10		Yes		Davie	200	
133		C10		Yes		Davie		
134		C14		Yes		Brown	147	
135		C14				Sillifant	83	
136		C18				Crediton Trust	22	
137		C18				Burrows	46	
138		C16		Yes	C18			
139		C18				Norrish		
140		C13				Wreford	141	

Table 4.1 (continued) Showing Historic Fields AL-AS (continued over)

	AT	AU	AV
1	Extra Characteristics	Other Comments	Sited near Head Materia
2	EXTRAS	COMMENTS	HEAD
3			Yes
4	hoodmoulds		Yes
5	strap hinges		Yes
6		Core of house C16, Cob walls to garden.	Close
7			
8	massive fireplace	Smoke blackened roof, probably original Manor house. Hoskins: ?12C	
9			
10		Recorded on SMR as being a Saxon settlement	
11			Yes
12	4-panel moulded oak beam ceiling	Cob walls to garden	Yes
13		Part of Oaklands	Yes
14	brick side oven		Yes
15	stone side oven	Smoke blackened roof	Yes
16			
17	Panelled ceilings	Exceptional smoke blackened roof, earlier chapel, oak doorways, oak plank and muntin screen	
18	Pigeon holes and C17 owl hole	Later C19 engine house. Projecting midstrey walls. Felling date of 1483 - 1490 (Thorne)	
19			
20	adjoining byre and loft		
21	outshuts to rear		
22	side oven		
23	internal jetty, oak post with jowled head	Smoke blackened roof, mentioned in charter of 997	
24			
25			
26	brick oven, plank and muntin screen, C17 panelled screen	Carved inscription TG 1704	Yes
27			Yes
28		Alcock's Type T1 linhay. One post circular cob on stone plinth (like Woolsgrove).	Yes
29	Rear kitchen wing , original details covered or changed		Close

Table 4.1 (continued) Showing Additional Detail Fields AT-AV

	AT	AU	AV
30	Extra Characteristics	Other Comments	Sited near Head Material
31	Two plank and muntin screens, muntins with step stops		
32	Large gable stack projects and has oven projection		
33			Yes
34			
35	Projecting stack with Beerstone ashlar quoins. C18 kitchen wing		Yes
36			
37	Lateral stack of snecked volcanic stone, castellated top	Prebendary farm for use of Preceptor of Crediton Collegiate Church, in Valor Ecclesiasticus	
38	C17 range comprises kitchen/bakehouse with massive granite fireplace	Three ranges of farmbuildings form courtyard to rear of Woolsgrove Farmhouse	
39			
40			
41		One end of former farmhouse, rest is Lower Shoplands	Yes
42	End stack exposed volcanic rubble with granite ashlar quoins.	One end of former farmhouse, rest is Rowan Tree Cottage	Yes
43			Yes
44			Yes
45	Oven projection by ccentral lateral stack	Started as farmhouse, converted to three cottages and then to one house	Yes
46		Mortimers C18, Snows added C19	Yes
47	C17 oak plank and muntin screen with chamfered and scroll stopped muntins		Yes
48			Yes
49	round projections front and back, cider store	Purpose built inn on former Crediton-Barnstaple Road	Yes
50	cob party wall between original cottages	Orignally connected to Hare and Hound Inn (now Hare Cottage)	Yes
51			Yes
52	carved appex bosses, oak plank and muntin screen with traces of paintings	Important farmhouse. Bremridge family recorded from 1200, William Benelrig occupant in 1330	
53		Recorded in Domesday. One of the eight Prebendary farmsteads in Parish, with Frogmire in TA	Yes
54	Oven projection		
55			
56			
57			Yes
58	massive kitchen fireplace	Roof inaccessible	

Table 4.1 (continued) Showing Additional Detail Fields AT-AV

	AT	AU	AV
59	Extra Characteristics	Other Comments	Sited near Head Material
60	12 pigeon holes	Adjoining cob granary and cider house. Site of medieval estate. one of 18 tithings of Crediton	Yes
61			Yes
62			Yes
63	owl hole	Includes shippon and cart shed	Yes
64			
65	thatched dormers		
66	C17 porch with panelling, C17 interior doorframe, two cross wings	In Charter of 930, a Domesday Manor, owned by Chichester	Yes
67	original chimney shaft		
68	projecting midstrey walls and threshing floor	Additional C19 horse engine house and poultry house	
69	cob dividing wall between cottages		Yes
70	C16 oak plank and muntin screen. C16 volcanic stone chimney	1920 additions	
71	large oven projection, eyebrow thatch over windows		Yes
72	large fireplace in forge part		Yes
73	C18 barn, now part of house, has 3 bays and pegged lap jointed collars		Yes
74	cob wall attached to cottage with pitched thatch roof		
75	thatch eyebrows		
76		Originally two cottages with Tiny Thatch being the older one roomed cottage	
77		Listed as of group value	
78	Coade stone detail. Doric half columns, unfluted on granite stylobate. Dated 1825.	Built as school. Listed by EH as being build of brick or rubble	
79		Parish church, included as on EH List	
80	iron spear railings		
81		Church included as on EH List	
82	Tudor revival windows, wavy bargeboard	Included as on EH List	
83			
84	carved coadstone headstone to architrave		
85	Portland stone parapet	Converted in 1979	
86	tabled thatched porch, leaded glass, bas-relief decoration	Tudor style cottage Ornee	Yes
87	elaborate wrought iron double gates under semi circular arch	Lodge to Creedy Park, similar to East Lodge	

Table 4.1 (continued) Showing Additional Detail Fields AT-AV

	AT	AU	AV
88	Extra Characteristics	Other Comments	Sited near Head Material
89	elaborate wrought iron double gaes under semi circular arch	Lodge to Creedy Park, similar to West Lodge	
90	Separate west wing made from stables	Listed by EH as rubblestone but main house has some cob walls	
91	ashlar based verandah with slender cast iron stanchions		
92	floor of ash house in garden, barn adjoining No 1 cottage	Divided in 1970's	Yes
93			Yes
94	part of C16 oak plank and muntin screen survives, thatched half dormers	an interesting building hidden under later work	Yes
95	C16 chamfered mullions, stair turret, leaded glass	a very interesting building with many later alterations	
96	square gate piers with granite caps		Yes
97		originall 6-bay Alcock Type T1 linhay	Yes
98	richly moulded head and gable over half dormer	Particularly interesting Grade Two Star building	
99	Coronation pump, dated 1838		
100	gabled porched with flat arched valance, granite threshhold		Yes
101		4-bay Alcock Type T1 llinhay	Yes
102			Yes
103	C16 chimney shaft with capping	two builds shown by straight join. C19 shopfront with pilasters and entablature	
104		included in List by EH for group value	
105	cob fireplace	originally house and cobbler's shop	Yes
106			
107		included as part of Sandford EH List	
108	Doric porch with fluted columns and moulded entablature	interesting C19 house that may contain cob walls	
109	lobed vase cast-iron finial, niches with chamfered sourrounds, domed ceiling	interesting early C19 summerhouse that may also be cob	
110	plank and muntin screen, muntins chamfered with scroll stops on both sides		Yes
111	C17 volcanic stone chimney shaft, rear stair turret	Modernisation in 1984 caused great damage: removal of mullions, ovolo moulded wth diamond stops	Yes
112		included as part of Sandford EH List	
113	Cob stack with stone oven. Inserted floor. Felling date of 1538 - 1558 (Thorne)		
114	brick plinth, clustered chimney shafts		Yes
115		potentially interesting farmhouse	Yes
116		Originally one house. One of the prebendary farms	Yes
117	two plank and muntin screens, two stair turrets, remains of painted figures on screen	an exceptional cob building	Yes

Table 4.1 (continued) Showing Additional Detail Fields AT-AV

	AT	AU	AV
118	Extra Characteristics	Other Comments	Sited near Head Material
119			
120			
121			Yes
122			
123			Yes
124			Yes
125			Yes
126			Yes
127			Yes
128			Yes
129			
130			Yes
131			
132			Yes
133			Yes
134			
135			
136			Yes
137			
138			Yes
139			
140		Chapel at Esse Boleyn licneced in 1407. St. Georges Chapel	

Table 4.1 (continued) Showing Additional Detail Fields AT-AV

APPENDIX FOUR

Detailed descriptions of characteristics relating to century of origin.

This Appendix augments the information contained in Table 5.3 in Chapter Five.

Fifteenth Century Listed* Cob Buildings

Only three fifteenth century buildings are included in the List of Buildings of Special Architectural or Historic Interest (English Heritage 1985) for the parish of Sandford. These are Dowrich Outbuilding, Prowse and Combe Lancey. Two of these face south and one faces south-east. Prowse and Combe Lancey are former farmhouses, Dowrich Outbuilding is a former domestic outbuilding, possibly a former farmhouse. Prowse and Combe Lancey are both thatched* and have hipped* and gable ended* roofs with lateral* and axial* stacks.

All have smoke blackened* side pegged jointed cruck* roof structures and are of original three-room cross-passage* plan. Documentary references exist for all three buildings; Combe Lancey is mentioned in the Domesday Book* and Prowse, formerly Higher Dodderidge, is mentioned in 1333.

All these buildings will have undergone change but the overall depiction of the limited number of Listed fifteenth century buildings shows middle sized cob walled buildings with hipped* or gable ended thatched* roofs with jointed cruck* roof structures. The position of the chimney stacks and the presence of smoke blackened* roof timbers indicate that these buildings were formerly open hall* houses.

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* see Glossary

There are no Listed cottages and no Listed farmbuildings of this age which corresponds with theories that only substantially built middle or higher status cob buildings are likely to have survived from this period (Brunskill 1988: 27, Hulland 1980: 127 and Keefe and Child 2000: 35).

Sixteenth Century Listed Cob Buildings

Twenty four extant sixteenth century cob buildings are Listed, nine of which are located within settlements and the remainder distributed throughout the study area. Archival documents, however, show evidence of buildings on these sites prior to the sixteenth century.

From the available data the buildings are shown to retain characteristics similar to those of the three Listed fifteenth century cob buildings: predominantly south facing thatched* farmhouses and houses with hipped* or gable ended* jointed cruck* roofs, five of which show evidence of smoke blackening*. The majority are of three-room cross-passage* plan and have lateral* and axial* stacks. As was discovered with the fifteenth century Listed cob buildings, the majority represent middle status farmhouses and houses. Only two cob cottages and three cob farmbuildings are included.

Seventeenth Century Listed Cob Buildings

Twenty seven cob buildings are Listed as being of seventeenth century origin, half of these are sited within settlements. Three have documentary references to an earlier building of the same name in the thirteenth century and two are recorded on the Norden terrier of 1598.

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* see Glossary

As with the cob buildings of the previous two centuries, the majority of the buildings face south and are farmhouses and houses, but a greater number of cob cottages and farmbuildings are also described.

Most are thatched*, or were previously thatched*, and the roof shapes are equally hipped* and gable ended*. No jointed cruck* roof structures are described; the majority of the buildings documented contain A-frames* with jointed collars*.

Two-room original plan forms predominate and only four buildings are noted as having three-room cross-passage *plans. End chimneys predominate although the presence of thirteen lateral* and axial* stacks may indicate earlier origins to certain of the buildings. The change from jointed cruck* roof structures to collared A-frame* structures in the seventeenth and eighteenth centuries has been commented on by Keefe and Child (2000: 35).

<u>Eighteenth Century Listed Cob Buildings</u>

Twenty cob buildings of eighteenth century origin are Listed of which eleven are in settlements. At this date, settlements show a steady increase in the numbers of existing buildings. This is particularly true of the settlement at New Buildings, where archival references show that certain of the buildings Listed were used for purposes connected to the proximity of the toll road, namely a wheelwrights, a forge and an inn. The buildings tend to have a south-easterly aspect, rather than southerly, as in earlier centuries.

* see Glossary

There is also a change in the type of cob buildings surviving. The number of cottages is four times greater than farmhouses and there are no houses Listed of eighteenth century origin. Thatch* remains the roof covering of choice and the roof shape continues to be a combination of hipped*, half hipped* and gable*. Unfortunately, only one roof structure is identified for the twenty buildings and this is a king post* roof in an outbuilding.

The original plan forms described are principally two-room, indicating the smaller domestic dwellings. Eight axial* or lateral stacks* are identified among the eighteenth century cob buildings, which may indicate that some of these have origins earlier than the Listed description would suggest. North Creedy, for example, is Listed as being of late eighteenth century, or early nineteenth century origin, but documents refer to the site in the early sixteenth century. The increased number of surviving cottages again corresponds with the belief that cottages from earlier centuries did not survive as they were less substantially constructed than the higher status farmhouses (Brunskill 1988: 27, Hulland 1980: 127 and Keefe and Child 2000: 35).

<u>Nineteenth Century Listed Cob Buildings</u>

Twelve nineteenth century buildings are Listed, ten of which are sited in settlements. Three of these are in New Buildings and four in the main village of Sandford. Building types vary from cottages to a substantial house, Star House, in Sandford Square and a purpose built Inn. Thatch* is the most commonly used material for the roof covering and the majority are hipped*, half hipped* or gable* ended. The plan forms are mostly two-room which, as in the previous century, indicate cottages.

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* see Glossary

The large primary school, dated 1825, with a front entrance portico* with Doric* half columns, is described in the Listed entry as being of plastered brick or rubblestone. However, a site visit to the school, described in Chapter Six, and evidence from drawings made in 1937, have identified that the walls are constructed of cob. This mistake illustrates the problem of identifying buildings constructed with cob walling material, particularly where walls have an exterior rendering. (Sandford School is the subject of a case study described in Chapter Six).

* see Glossary

ABBREVIATIONS

ADS	Archaeological Data Service
BGS	British Geological Survey
CEA	Centre for Earthen Architecture, University of Plymouth
CRATerre EAG	International Centre for the Research and the Application of Earth Construction at the School of Architecture in Grenoble
DEBA	Devon Earth Building Association
DRO	Devon Record Office
EARTHA	East Anglian Regional Telluric Houses Association
EMESS	East Midlands Earth Structures Society
ENPA	Exmoor National Park Authority
GIS	Geographical Information System
ICCROM	International Centre for the Study of the Preservation and the Restoration of Cultural Property
ICOMOS UK	International Council of Monuments and Sites, United Kingdom
MONARCH	Monuments and Archives
MIDAS	Monuments and Information Data Standard
NMR	National Monuments Record
OS	Ordnance Survey
LBS	Listed Buildings System
RCHME	Royal Commission on the Historical Monuments of England
SMR	Sites and Monuments Register

GLOSSARY

Achievement: a shield shape surrounding a coat of arms or initials.

Adobe: unburnt sun dried earthen bricks.

A-frame: Roofing timbers joined in a triangular form by a tie beam or collar.

Arch bracing: curved roof timbers used for support.

Architraves: frames surrounding a door or window.

Ash house: a small outbuilding for the storage of ashes.

Ashlar: shaped blocks of masonry.

Axial beams: beams placed across a room, at right angles to the main axis of the house.

Axial chimney stack: a chimney placed on a cross wall of a house.

Bakehouse: an outbuilding formerly used as a kitchen.

Bargeboard: boards attached to gable ends of pitched roofs, often decorated.

Batter: sloping face of a wall.

Bauge: French for an earthen wall of monolithic construction, similar to cob.

Bee-boles: Devon dialect for hollows in cob walls used for straw beehives.

Bosses: ornamental projection, usually carved, at the intersection of timbers.

Breccia: Permian rocks (geological material).

Bressumer: horizontal beam spanning a fireplace or other opening.

Butt purlins: a form of purlin used in a roof structure.

Cambered collar: a roof collar where the centre is higher than the ends.

Cartouche: an ornamental panel.

Castellated: decorated with small battlements.

Ceiled: the insertion of a ceiling and floor into an open hall to create first floor rooms.

Chalk block: lumps of chalk material shaped into blocks for building purposes.

Chalk mud: a mixture of earth and chalk used in a similar manner to cob.

Chamfer: the shaping of the right angled edge of a piece of wood or beam.

Chapel of Ease: a chapel for parishioners living remote from the church.

Clay bats: East Anglian term for lumps of clay and straw mix.

Clay dabbins: Cumbrian term for lumps of clay used for construction purposes.

Clay lumps: East Anglian term for lumps of clay used for construction purposes.

Clom: Welsh term for an earthen mixture, similar to cob, used for walling material.

Clunch: Berkshire term for an earthen mixture, used for walling material.

Coade stone: an artificial cast stone used for decorative features.

Cob: mixture of earth, straw and water used for walling material.

Cob parer: flat metal tool used for removing surplus material from newly built cob walls.

Cranked collars: similar to cambered collars above.

Cross beam: beams placed across a room.

Cross-passage: a passage way at right angles to the main axis of a building.

Cross wing: a wing built at right angles to the main axis of a building.

Crucks: pairs of curved timbers in a roof structure that are joined at the top.

Culm Measures: Carboniferous rocks (geological material).

Dog leg stairs: two flights of stairs at right angles to each other and with a half landing.

Domesday Book: extensive survey of land compiled for William the Conqueror.

Doric: type of classical column decoration.

Double depth: building that is two rooms deep, also termed double pile.

Dovecotes: housing designed specifically for doves or pigeons.

Dovetail lap jointed collars: form of collar construction used in a roof structure.

Dung fork: agricultural tool used for handling manure.

Flat arched: description of the head of an opening.

Formwork: shuttering used in the construction of earthen walls.

Frieze: decorated band along upper part of a wall, usually in plasterwork.

Fulling mills: mills, usually water powered, that housed machinery for cloth processing.

Gable end: the upper triangular part of a wall that supports a pitched roof.

Grade: categories assigned to Listed buildings, Grade I, Grade II*, Grade II

Half-hipped roof: roof structure with sloping ends, in upper part only, on lateral walls.

Hipped roof: roof structure with sloping, rather than vertical ends, on lateral walls.

Infill panels: areas of infilling between timbers in wooden framed buildings.

Intersecting panels: areas of plaster between ceiling beams.

Jointed collars: carpentry term for junction of collars to trusses in a roof structure.

Jointed crucks: combined wall post and rafter formed from jointed pieces of timber.

Jowl: a post with a thickened head that provides support for a cross beam or wall plate.

King Post: upright central post in a roof truss, connecting tie or collar beam to ridge.

Knapped: a flint that has been split and shaped for a particular purpose.

Lapjoint: a junction of halved timbers.

Lateral chimney stack: a stack inserted or originally built in a longitudinal wall.

Lights: panes of glass, or the spaces between mullions in a mullioned window.

Lime-ash: a mixture of lime, ashes and earth used as a flooring material.

Limewash: a decorative external coating that contains lime.

Linhay: open front animal shelter with fodder storage above.

Listed Building: statutorily protected building of special architectural or historic interest.

Lobby entrance: plan form with fireplaces on axial wall and an entrance into a lobby.

Midstrey: short projecting walls supporting a roof either side of a barn door.

Mortise and tenon: a type of joint used to connect two pieces of timber.

Mud and studs: load bearing mass earth wall with timber armature.

Mud blocks: similar to clay lumps above.

Mullioned windows: windows with vertical uprights dividing glazed panes or lights.

Multi-panel doors: doors with vertical and horizontal members enclosing several panels.

Ogee moulding: S-shaped moulding with convex and concave faces.

Open hall: plan form with a double height main chamber.

Outshut: one storey extension with sloping roof, usually on rear or side wall of building.

Ovolo moulding: wide convex moulding.

Panel doors: doors with vertical and horizontal timbers enclosing two or more panels.

Partially hipped roof: roof structure that is hipped at one end only.

Pediment: type of gable used in classical architecture.

Pegged lap joints: a variation of lap joints where pegs are used for fixing the joint.

Pisé: earthen wall construction method where earth is rammed between shuttering.

Plank and muntin: screens constructed of horizontal boards grooved into upright timbers.

Plank doors: doors constructed of vertical or horizontal boards.

Plinth: stone or brick base of a cob wall.

Portico: roofed entrance to a building, usually supported on pillars.

Post and beam: form of timber framing for a building.

Pottery shards: small pieces of material from discarded pottery.

Pound house: outbuilding used for crushing apples in cider making process.

Prebendary farm: a farm in ecclesiastical ownership and administered by the Prebend.

Privvies: outbuilding built to house a lavatory.

Purlins: horizontal roof members that help support the rafters.

Rammed earth: earth rammed between shuttering to form a wall, similar to pisé above.

Relict: remains of a former structure.

Ridge: the top of a roof or the top of a hill.

Roof bay: space between roof trusses.

Rubblestone: masonry comprised of small, rough, non-ashlared stones.

Sash windows: sliding windows that usually slide vertically but may slide horizontally.

Shoulder headed: door architrave with yoke shaped lintel.

Shuttering: boards used to contain the earthen mixture during construction process.

Side pegged: a joint pegged on the side rather than the face of the timber.

Smoke blackened: evidence of soot on the inside of a roof from a previous open hearth.

Smoke hood: a canopy or hood designed to channel smoke to a chimney or roof opening.

Squint light: small window or opening allowing a view of an entrance doorway.

Stair block: projection on building housing a staircase.

Stops: the plain or decorative ending to a chamfer (see above).

Strapwork: a form of decorative plasterwork with interlaced bands or straps.

Stucco: external plasterwork or rendering on a building.

Stylobate: the structure supporting a colonade.

Thatch: a roof covering of straw or reeds.

Three-room cross-passage: a plan form with rooms either side of an axial passageway.

Threshing barn: a barn with opposing doors, used for the hand threshing of corn.

Threshing floor: a hard floor, paved or boarded, used for threshing corn with a flail.

Toll house: a building formerly used for the collection of tolls levied on users of the road.

Truss: the principle timbers in a roof structure.

Turnpike: a road on which a toll was charged.

Turret stairs: a staircase housed in a turret projecting from a building.

Two-room cross-passage: a plan form with one room either side of an axial passageway.

Wainscotting: panelling used on the lower half of an internal wall.

Wattle and daub: earthen based paste applied to an armature of interwoven wood.

Wichert: Buckinghamshire dialect for an earthen walling material that contains limestone.

Windbracing: extra timbers, usually curved, used to strengthen a roof structure.

Winder stairs: circular or winding staircase with treads wider at one end than the other.

Yoke: a wooden structure fitted at the apex of two trusses which carries the ridge plate.

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THE DEVELOPMENT OF AN INVENTORY FOR THE STUDY OF EARTH BUILDINGS

MAGGIE FORD
LINDA WATSON

INTRODUCTION

The aim of the project is to create a sound methodology and terminology for describing and recording buildings constructed of earth.

It is essential to stress that this project is in its infancy and this is but an outline of how the task is being tackled, the reasoning behind the methodology being developed and the way in which it is envisaged the data will be collated and presented.

It is hoped that the result will be methodology that is easy to use, adaptable for recording different forms of earthen construction and sufficiently flexible to be integrated with other programmes, be they manually based or designed for computer analysis.

It is also hoped that the inventory will be more than a tool for describing earth buildings of a particular form in a particular area. By increasing the scope of the research it should be possible to consider the influence on the buildings of qualitative aspects such as typology; function; historic, economic, social and cultural as well as quantitative aspects such as quality of the material used and environmental factors. Conclusions may be then be drawn as to the development, significance and survival and condition of earth structures within a given area.

THE PROJECT AREA

In collaboration with the geologists and the engineers involved in the project, Parishes in the Crediton area of Mid Devon have been selected for recording and analysis. These Parishes contain a high proportion of cob structures and for this reason were initially investigated by the Mid Devon District Council. Within the Project Area a Pilot Study of one Parish is being undertaken for preliminary testing of the proposed inventory format.

METHODOLOGY

Prior to developing this format other national and international methodologies designed for appraising and recording buildings were evaluated. All adhered to the guidelines of Article 16 of the Venice Charter (1964). Their emphasis, levels of recording intensity and systems used for processing data, however, varied according to the aims and objectives of their designers.

The trial format being tested in the Pilot Study adopts a contextual approach with sections for geographical location; for building and architectural details; and for environmental factors. It also includes sections for recording written, graphical and statistical material from archival, cartographic and other sources.

Incorporated into the trial format are standard approaches used by English Heritage and Royal Commission on Historic Monuments of England including the coding system for building type, use and condition.

Emphasis has been placed on recording as much information as possible regarding the construction of the earth walls and their relationship to other building components. For example dimensions of the plinth, of the walling, and of the "lifts" are incorporated together with identification of the types of render, cladding and decorative finishes used.

Features unique to earth buildings are being recorded including identification of materials used and, where possible, their source; types of drainage systems, if present; and shaping of the material for specific purposes, such as bee-bols. Adjacent earthen structures - outbuildings, walls etc are also being recorded.

Recording of roofing types, structures, original and replacement materials are likewise accorded importance to allow for eventual analysis of relationships between roof and wall construction which may be relevant to earth walled buildings. Drawings will be included of plan, section and elevation plus photographs to assist in the analysis of development etc.

In conjunction with the descriptive and analytical recording further interpretation of influences on the development, use and condition will be recorded utilising sources of information about the buildings in relation to the architectural, social, economic and cultural history of the region.

Finally information from the pilot study will be integrated with geological and geotechnical data to produce layered thematic maps of the area.

PRESENTATION AND ANALYSIS OF DATE

The information acquired from the collection of data and archival material will be collated, stored, analysed and presented using the Arc/Info Geographical Information System (GIS) at the NERC Remote Sensing and GIS Unit at the University of Plymouth. This powerful technique tool allows for the interpretation of both spatial and descriptive material. It combines a database system for the data collected from field surveys with the ability to digitise maps of the area; scan in and store graphical material, historic cartographic material and drawings; and display photographic records via the CD Rom.

RESULTS ANTICIPATED FROM THE PILOT STUDY

The pilot study is an initial approach to achieving the objectives of the project. Trials of the first survey format will identify, and hopefully correct, faults in its design. It is hoped that the method for recording will provide more than a synchronic, "snapshot", analysis of the earth buildings. By the use of the interpretative ability of the GIS, synthesis of the qualitative data and the quantitative data can be undertaken to try and identify significant links between the various factors involved.

To allow for the methodology to be adapted for different purposes the survey format has been developed so that the data may be manually recorded as an alternative to utilising a database system. It is also intended that the methodology should allow for information from the computerised GIS to be accessed at several levels of recording intensity so that it may be of use for diverse purposes.

CONCLUSION

By undertaking this project it is anticipated that an inventory format can be designed and tested that will be of use in recording all types of earth buildings. It is also hoped to demonstrate that the use of a GIS can greatly assist in the interpretation of both descriptive and spatial data to create a comprehensive analysis of the development, use, significance, survival and condition of earth buildings.

These results will be of benefit for numberous reasons including the following :

1. Increased profile of earth buildings resulting in better public and professinal awareness.

2. More informed Listing of earth buildings.

3. Better conservation management to improve targetting of finances etc.

4. Identificiation of further specific projects for scientific and technical research.

5. Effectiveness of various maintenance, repair and alteration techniques.

6. Knowledge to begin to answer the numerous questions currently asked from "how many cob buildings are there?" to "will cement renders always lead to disastors?"

Developing a Conservation Strategy For Earthen Buildings

M. Ford, L. Watson and H. El Kadi
School of Architecture, University of Plymouth,Hoe Centre, Notte Street, Plymouth,PL1 2 AR, Plymouth, UK
E-mail: mlford@Plymouth.ac.uk

Abstract

"The new topographers, seeking to find the historical explanation for the intricately organised landscape of the British countryside, have related rural buildings to their wider setting"[1]

The aim of this paper is to develop a methodology for recording and analysing historic earthen buildings for use in developing conservation strategies. The analysis of vernacular buildings in their setting requires careful investigation of indigenous materials plus knowledge of local construction methods and historic development. Recently the value of the vernacular has emerged as important as other architecture. Geographical Information Systems (GIS) can play a major role in the analysis of such buildings. This paper outlines the use of GIS for analysing historic earthen buildings in a study area in mid Devon in the South West of England. The context of the work relates to ongoing research into various aspects of the properties and performance of earth as a buildings material, initiated at the School of Architecture, University of Plymouth. The paper concludes with the exposition of the relationships between vernacular buildings, physical variables (i.e. topography and geology) and archival data.

1 Introduction

In an age when resources are limited, but change inevitable, it is vital to target all conservation activity to ensure that of value from our past survives in an appropriate manner. This requires carefully considered strategies based on a series of priorities. Whilst the priorities can emerge from many different sets of criteria, the soundest seems to be a full appreciation of the historic and architectural worth of individual buildings and their contribution to the townscape and landscape.

To judge whether an example has value, and to determine its significance requires an agreed set of guidelines. In the case of buildings which have been created by architectural rules of aesthetics, an understanding of these rules and presidential models can form a sound basis for evaluation. Age and technical innovation can also inform our judgement, but the former requires documentation to determine dates and the later an understanding of historical development of materials and structural, mechanical and constructional systems.

The basis for evaluating the vernacular is much more difficult, because this architecture is derived from indigenous materials, using local knowledge for constructing buildings in direct response to climate and occupants' needs. It is architecture which has evolved from its location and as a consequence the surroundings of buildings need to be understood to help evaluate their worth. Reference to standard texts discussing the history of architecture are unlikely to help explain the vernacular, unless the example in question is a hybrid which has been influenced by aesthetic ambition, in addition to indigenous materials and other local circumstances.

It is only recently that the value of the vernacular has emerged in England as important as other architectures. Campaigners like Dr.Brunskill and Prof. Cordingley, were exceptional in drawing attention to this precious type of building, threatened with extinction through lack of protection and inadequate awareness of its value. But how can the vernacular be evaluated in order that sound strategies can be developed for its protection and conservation?

This question is pertinent to buildings constructed from earth. Frequently these buildings do not display "polite" characteristics, so the basis upon which vernacular earth buildings can be evaluated has to be established before the commencement of an informed conservation programme. The criteria necessary can only emerge from the accumulation and analysis of knowledge including historical and geographical information on individual buildings and their surroundings.

2 Current recording systems

Currently, the two most extensively used systems for evaluating and recording historic structures in England are those of the Royal Commission on the Historical Monuments of England (RCHME) and English Heritage (EH). The latter's method, used for the recording of Buildings of Architectural and Historic Interest, was first introduced in the 1940s and, in essence, records buildings using "descriptions which bring out the significance of the buildings as succintly as possible."[2] The resurvey of Listed buildings between 1982 and the 1990's has meant that the majority of buildings of special interest have been identified and afforded some protection.

This evaluation of buildings has also emphasised the importance of vernacular architecture.[2]

Previously, critiscism could be levelled at English Heritage's method of recording because of the tendency to view a building, or group of buildings, as specific individual artefacts. However, in the past few years for practical and logistical reasons, English Heritage's policy has shifted to Listing in a more thematic way, reviewing building types such as those which illustrate important local industry.[3]

These policy changes, important as they are, allow for a comparison of building type but not for an examination of contextual relationships that exist between structures and their geographical and social surroundings, relationships that are of particular significance when evaluating the vernacular.

These perceived limitations have directed the developed methodology to create a recording system for earthen buildings which allows for the incorporation of such contextual information.

3 Development of relational data base

The earthen buildings, within the selected study area in Devon, utilise the traditional *cob* method of construction - "the West Country name for a building method in which sub-soil is mixed with straw and water, brought to a suitable consistency which is then placed in horizontal layers to form a mass wall."[4]

The recording technique involves the creation of an inventory database capable of containing and analysing descriptive and spatial data, both qualitative and quantitative. The base data set used, in respect of the cob buildings, is the existing English Heritage List of Buildings of Architectural or Historic Interest. In addition, data sets were derived from field appraisals and data acquired from written, graphical and cartographical sources.

The use of maps, in conjunction with the recorded details of the earthen buildings, provides the focal point of the project. GIS is used for relating buildings to their geographical surroundings. Information System can also provide excellent assistance for visual analysis as different levels of resolution can be obtained whenever required.[5] A Unix based Arc/Info programme is used to integrate and analyse the data sets both at horizontal levels (relations between different buildings) and vertical levels (relations between the buildings and different topographical and geological variables). The use of GIS also enables the integration of variables derived from archival material.

The relationship of the selected buildings to their surrounding environment was analysed using 1:10,000 scale maps of the study area. Separate files were created for the geophysical variables. Variables relating to the topography of the study area include contours, water systems, communication systems and field boundaries, (both historic and current) and variables relating to the geology are referenced to the underlying rock types.

Commercially produced digistised maps were considered unsuitable for the project as editions available at present did not suit the immediate needs of the study. Problems encountered included maps digitised at too small a scale, so there was considerable loss of detail on enlargement, and those at too

magnified a scale (1:2500) primarily designed for use in urban studies. They lacked the facility to create three dimensional modelling of the topography.

4 Selection of related variables

The variables used in relation to archival information are ownership of land and agricultural use. Many variables have been considered which might be of equal significance including industry, agricultural economy, political influence and social influence. The selection of the used variables was limited to those which have a direct relationship to the physical setting(s). Further investigation of the study area is expected to include other socio-economic variables.

Cartographical and graphical archival information has been digitised, scanned or photographed. Written material has been entered in database form.The aim is to create a recording methodology that will accommodate quantitative and qualitative data, and allow relationships between the earthen buildings and their physical and social environment to be explored and analysed.

From a total of over 100 Listed buildings in the study area, 78% are recorded as being wholly or partially constructed of cob. Appraisal is made of all these structures to demonstrate the use of the methodology in recording earthen buildings. 25% of the recorded cob buildings are investigated more fully in respect of constructional and architectural detail.

Each recorded building is allocated an identifying code and a ten digit Grid Reference which allows accurate linkage to the base maps. The format used to record the 25% of cob buildings more fully investigated is based on that presented by Dr. Brunskill (1984). This allows for analysis of relationships between different constructional features, (plinths and cob walling; roof structures and roofing materials) as well as between different buildings.

A thorough archival search to identify past ownership, age, and usage of the buildings has been undertaken. This has been considered necessary for the analyses outlined above.

5 Summary and Conclusion

The methodology outlined, utilising GIS, provides a basis upon which evaluation of vernacular earth buildings may be undertaken. The paper demonstrates the importance of analysing historical and geophysical data.

Such analysis allows decision makers to consider the age and relative significance of individual earthen buildings when developing conservation strategies. The creation of a digitised map of the study area has established relationships between the buildings and their topographical surroundings. (Fig. 1). Geographical features from the 1:10,000 map of the study area were digitised. The inclusion of field boundaries allows for comparison with historic maps. The analysis of different variables has demonstrated strong correlation between the siting of vernacular cob buildings and water sources, road and field systems (Fig. 2). The paper has analysed the siting of individual vernacular cob buildings in respect of the geology of the study area. Figure 3 indicates a relationship between some of the oldest cob buildings (Pre 1600) and particular rock and soil types. The analysis has also explained that some buildings have shown indications of earlier cob construction, later replaced by stone or other material. The paper has used archival cartographical material to relate vernacular cob buildings to historical features, including communications, settlements, ownership and field boundaries, in existence prior to the C19 (Fig. 4).

The paper has shown the importance of the use of GIS in relating different variables on both horizontal and vertical levels, taking into account geophysical as well as archival data. From this a better understanding of the buildings within the study area will emerge and thereby inform decision making for conservation strategies. Further work is needed to relate other socio-economic variables for the development of a more comprehensive technique.

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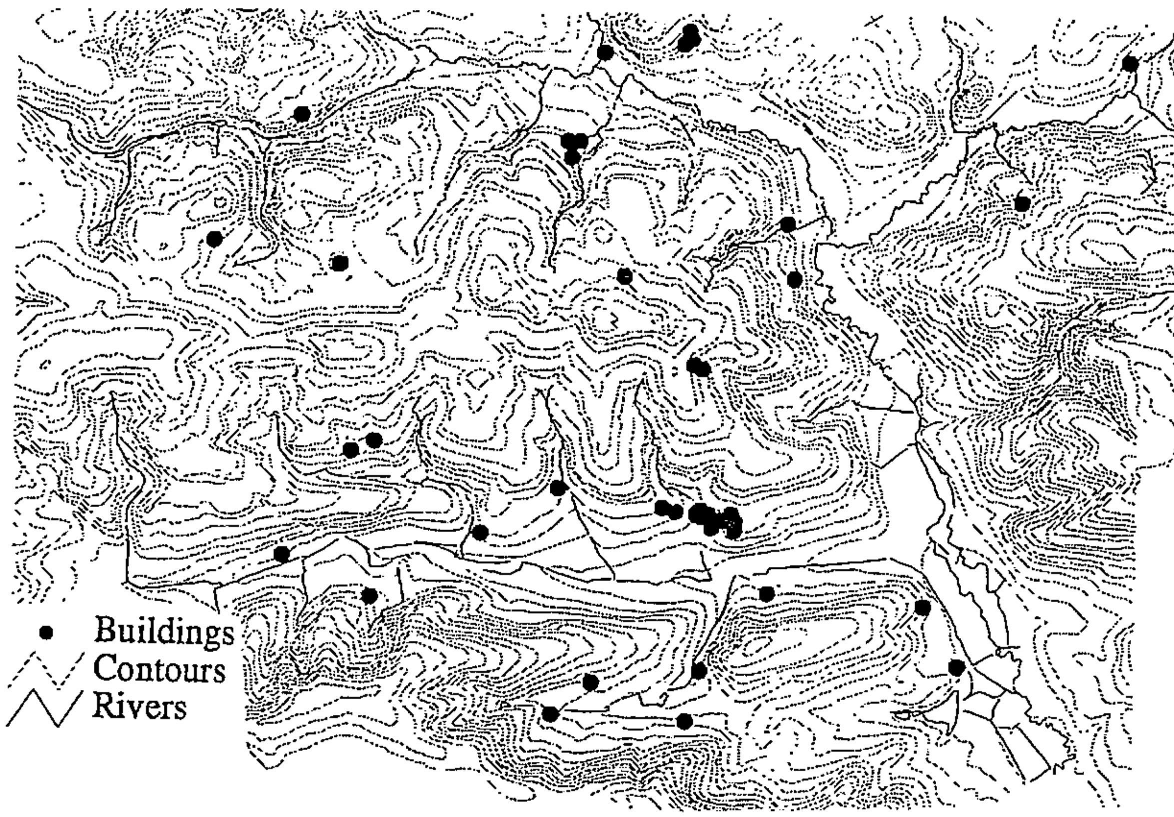

Fig 1: Relationship of cob buildings to topography of part of the study area.

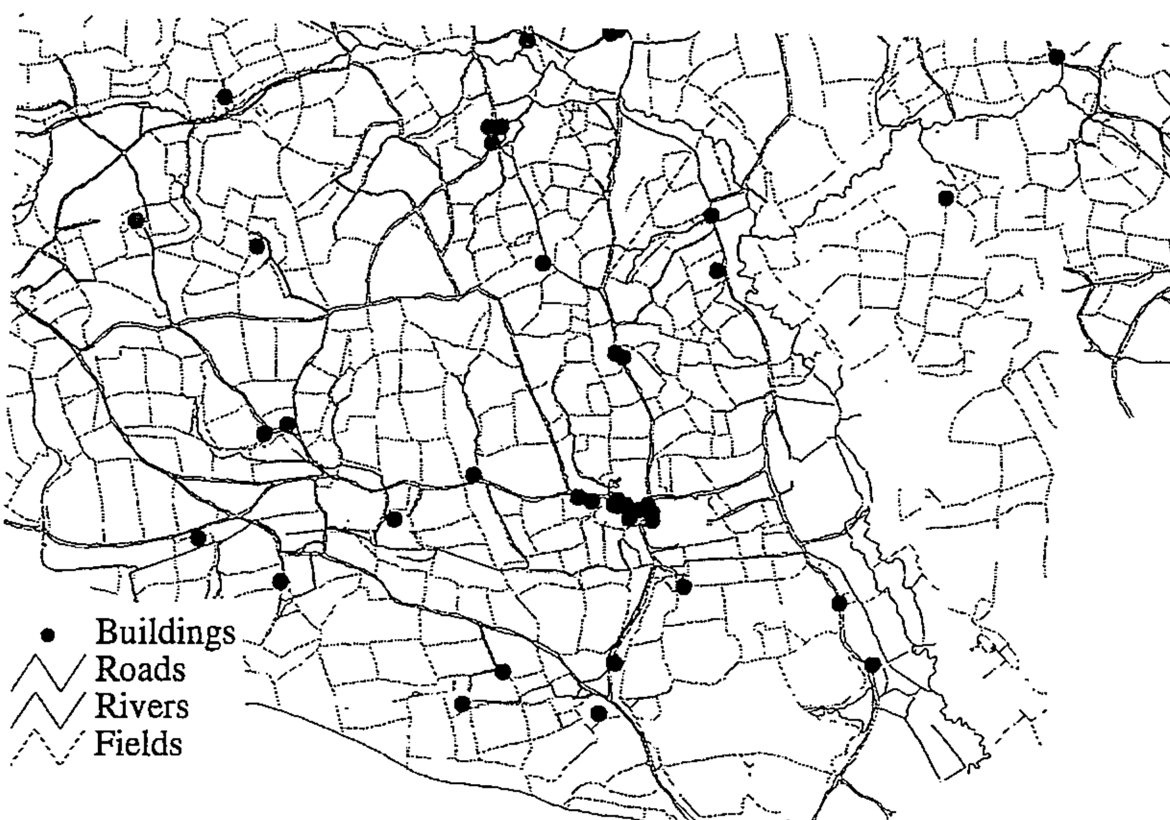

Fig 2: Relationship of cob buildings to roads and field boundaries in part of the study area.

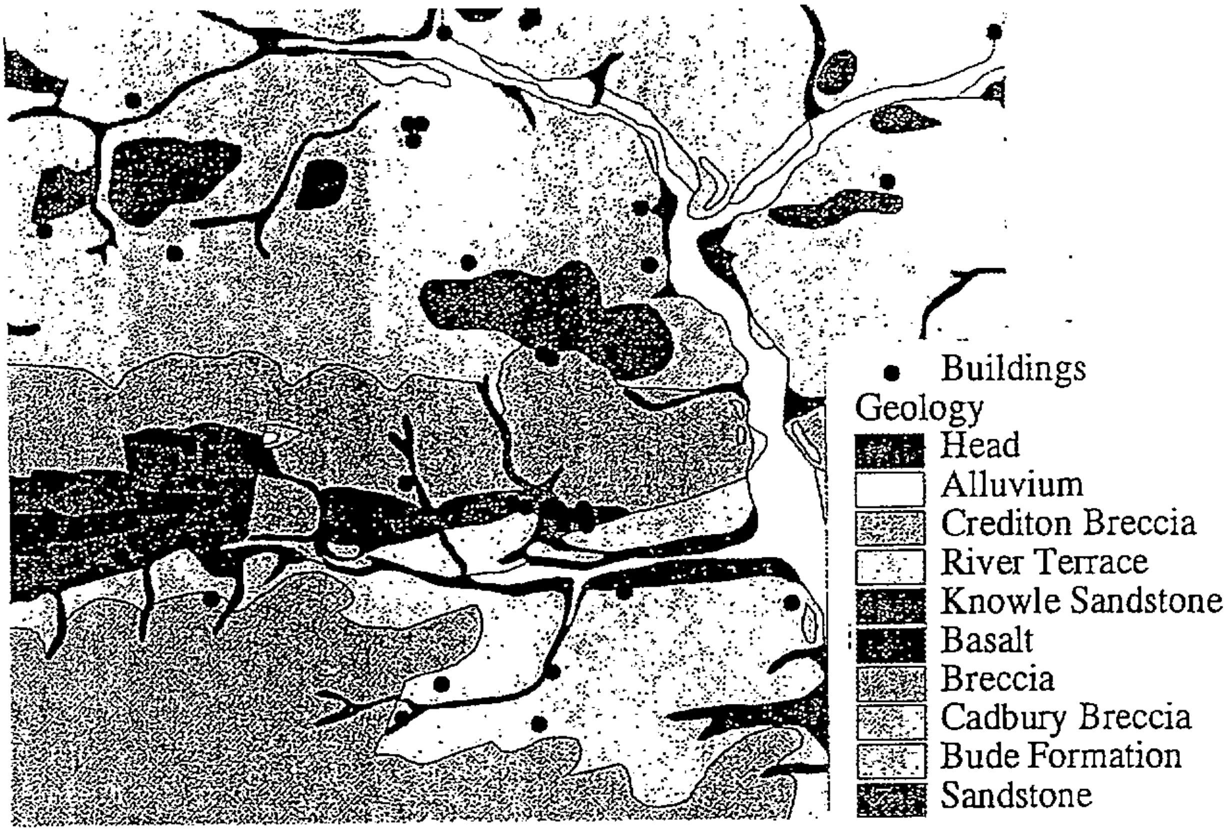

Fig 3: Relationship of cob buildings to geology of part of the study area

Fig 4: Historic map of group of vernacular cob buildings in part of the study area.

The Relevance of GIS in the Evaluation of Vernacular Architecture

MARGARET FORD, HISHAM EL KADI AND LINDA WATSON

Abstract

In the present climate of financial restrictions, the importance of identifying those buildings that are of greatest value has increased. Identification necessitates knowledge, not only of the architectural and historic worth of a building, but also of its role and contribution to the history and landscape of its location. This paper aims to demonstrate the relevance of Geographical Information Systems (GIS) in aiding historic research and analysis of vernacular architecture.

Related work in the development of GIS technology to assist in reconstructing and visualizing historical geography has been described by Southall[1] *and the role of GIS in managing and analysing spatial data in the field of archaeology has also been well documented.*[2] *By using a Unix-based Arc/Info GIS and incorporating geo-referenced spatial and textual data, a more comprehensive and contextual method of recording buildings can be developed. This allows better informed judgements to be made when evaluating individual buildings or preparing conservation strategies.*

Introduction

Research into the conservation of earthen buildings in the south-west of England has been undertaken at the University of Plymouth School of Architecture since 1992. Here, the Centre of Earthen Architecture was established to focus interest on the conservation of buildings that use the traditional and regionally important cob method of construction, described as being 'a building method in which sub-soil is mixed with straw and water, brought to a suitable consistency which is then placed in horizontal layers to form a mass wall (Figure 1).'[3] The aim of this work has been to support the revival of this rural skill, to ensure

From the reviewed literature, it would appear that during the late eighteenth and nineteenth centuries there was poor social acceptance of cob as a valid material for the construction of larger dwelling houses. Its use was typically for labourers' cottages and farm buildings, with, occasionally, the material being employed for a cottage orné or a picturesque estate village. At various times during the earlier part of the twentieth century, the use of earth as a building material was revived, seemingly for practical and aesthetic reasons. Williams-Ellis was already known as being among those who explored the possibilities of using earth for designing buildings in the post First World War period when there was an urgent need to increase stocks of rural housing using local materials. Lutyens also produced designs that could be constructed in cob.[7,8]

Recent literature has predominantly concerned itself with regional and national variations in earthen building typology and comparisons between different methods of construction.[9,10] Other recent work is related to the properties of earth as a building material.[11]

Current recording systems

Currently, the two most extensively used systems for evaluating and recording historic structures in England are those used by the Royal Commission on the Historical Monuments of England (RCHME) and English Heritage. Readers should note, however, that the RCHME was operationally merged with English Heritage on 1 April 1999 and that its functions now form part of a central Conservation Group.

The RCHME's method is outlined in their specification for recording historic buildings.[12] This explains that their task 'is to identify, survey, interpret and record buildings', aiming, not only to illustrate the buildings, but also to demonstrate their significance. The importance of accuracy, sourcing of information and dating of important aspects of the building is stressed, as is the need for the record to be in a form that is simple to duplicate. The RCHME has developed a comprehensive database of architectural and archaeological information, MONARCH (MONuments and ARCHives). This enables searches to be carried out using a variety of differing criteria, including simple geographical searches relating to location.

The method used by English Heritage for the identification and recording of buildings of architectural and historic interest was first introduced in the 1940s and, in essence, records buildings using 'descriptions which bring out the significance of the buildings as succinctly as possible.'[13] The re-survey of listed buildings between 1982 and the 1990s has meant that most buildings of special interest have been identified and afforded some protection. This evaluation of buildings has also emphasized the importance of vernacular architecture.[14]

Previously, English Heritage's method of recording could be criticized for its tendency to view a building or group of buildings as specific individual artefacts. In the past few years, however, both for practical and logistical reasons, English Heritage's policy has shifted to listing in a more thematic manner. This has involved reviewing different building types from those that illustrate important local industries and buildings that are associated with the defence of Britain to significant public houses and non-conformist chapels.[15] These policy changes, important as they are, allow for a comparison of building types, but not for an examination of any contextual relationships that might exist between structures and their geographical and social surroundings, relationships that are of particular significance when evaluating the vernacular.

It was this apparent lack of capacity in current recording methodologies that directed the described methodology for creating a recording system for earthen buildings.

Choice of study area

The area of study for this project was decided upon in collaboration with architects, engineers and geologists working on the properties and performance of earth as a building material. As this collaborative research involved soil types that overlie Permian and Carboniferous rocks, an area of similar geological origin was selected for the recording and analysis of the earthen buildings.

It was decided to use the smallest English administrative area, a parish, as the unit for analysis. One particular parish was considered as being suitable for study. Preliminary exploration and investigation revealed a variety of historically interesting cob buildings, with 78 per cent of the listed buildings within the parish considered by English Heritage to be partially or wholly constructed of cob. These included examples of the material being used in the construction of houses, cottages, farmhouses, farmbuildings, domestic outbuildings and garden walls (Figure 2).

The problem of blanket dating, frequently encountered when using

data collection, as this might inadvertently have led to biased conclusions. It was also considered important to establish the level of precision required.[17]

The decision was taken to use a Geographical Information System (GIS). The Unix-based Arc/Info programme provided a system capable of storing, manipulating and displaying geographically referenced data. It allowed complex queries of the data sets to be undertaken, provided for visual analysis at different levels of resolution, allowed the required level of precision to be established and permitted reuse of the data.[18,19]

The tabular dataset base of the cob buildings was derived from information abstracted from the list of buildings of special architectural or historic interest. Each earthen structure was assigned an individual identifying code and a 10-digit British national grid reference.

Other tabular datasets relating to ownership and use of the buildings and the surrounding landscape were derived from historic documentary material including the tithe apportionment for the parish; ecclesiastical, judicial, estate and parish records; and the county sites and monuments record. The variables selected for analysis were limited to those considered to have a direct relationship with the physical setting or the architectural attributes of the buildings.

The spatial datasets were digitized from Ordnance Survey maps of the study area. The selected variables related to the topography of the study area including contours, water systems, road systems and parish and field boundaries (Figures 3 and 4). The contours were entered as separate attributes to allow for detailed analysis of the orientation and siting of the buildings. The variables relating to the geomorphology were referenced to the underlying rock types. This data was traced from the original British Geological Survey drawings of the study area, digitized and then converted into polygons. This allowed for easier visualization of the solid and drift geology (Figure 5).

In order to verify the existence of the buildings at a known date, sections of the tithe map for the study area were scanned from photographs. These images allowed comparisons to be made with the current Ordnance Survey map. Additional archival cartographical and graphical material was also incorporated by scanning and from CD images.

It is anticipated that further investigation and analysis of the study area will take place, particularly for other socio-economic variables such as those relating to local industries, transport and the agricultural

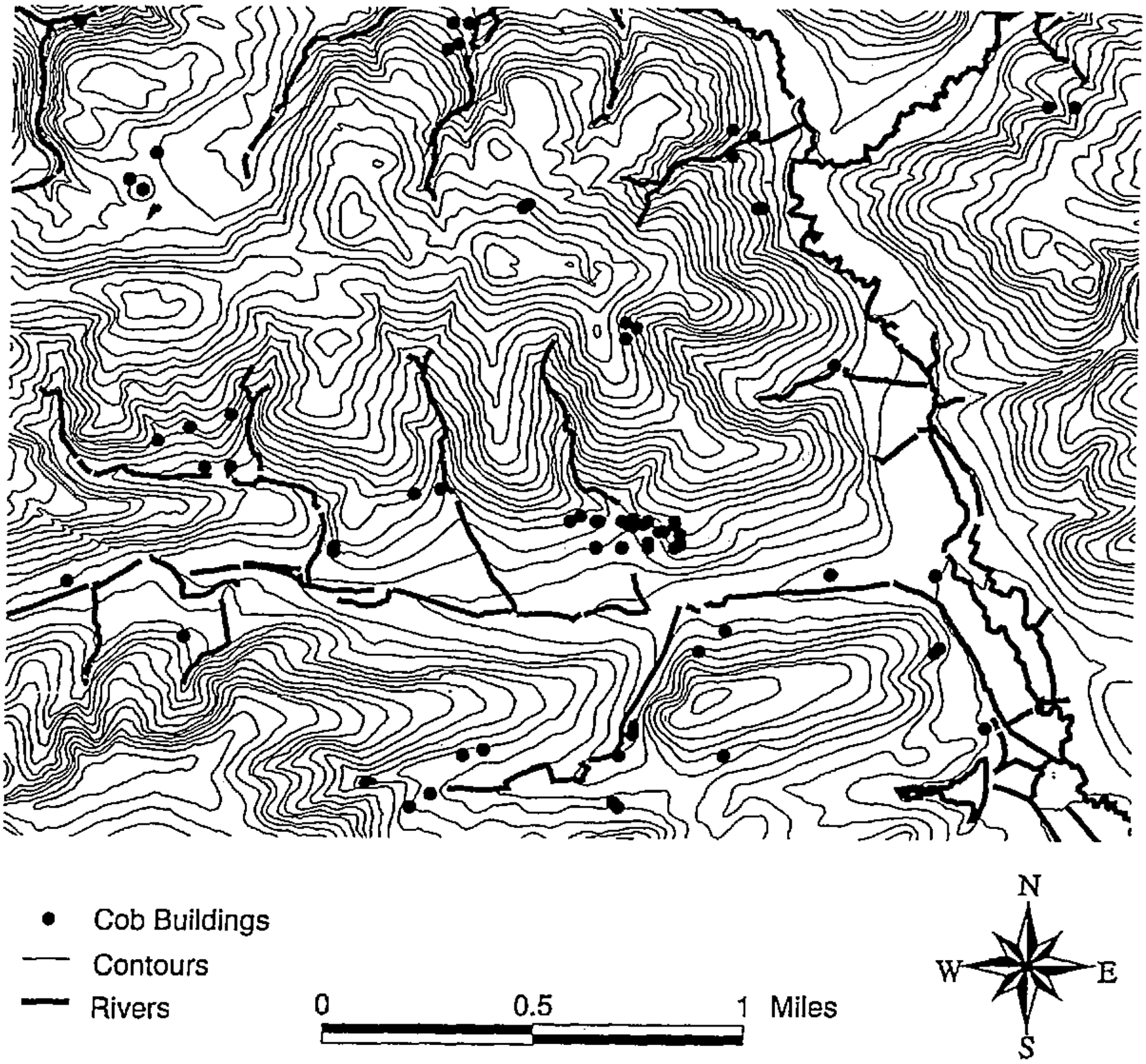

Figure 3 Relationship of cob buildings to topography of part of the study area.

economy. Consideration is being given to the possibility of integrating the results of the current programme with those of research into the physical properties of earth as a building material.

Summary and conclusion

The identification and recording buildings of historic value requires an understanding not only of their architectural significance, but also of their historic worth and contribution to the landscape. Recording necessitates collecting, storing and analysing architectural and documentary evidence relating to a district or area and selecting a suitable methodology to accommodate data of differing range and form. This can be problematic.

Existing recording methodologies lack the capacity to illustrate contextual relationships as they do not, at present, have the capacity to

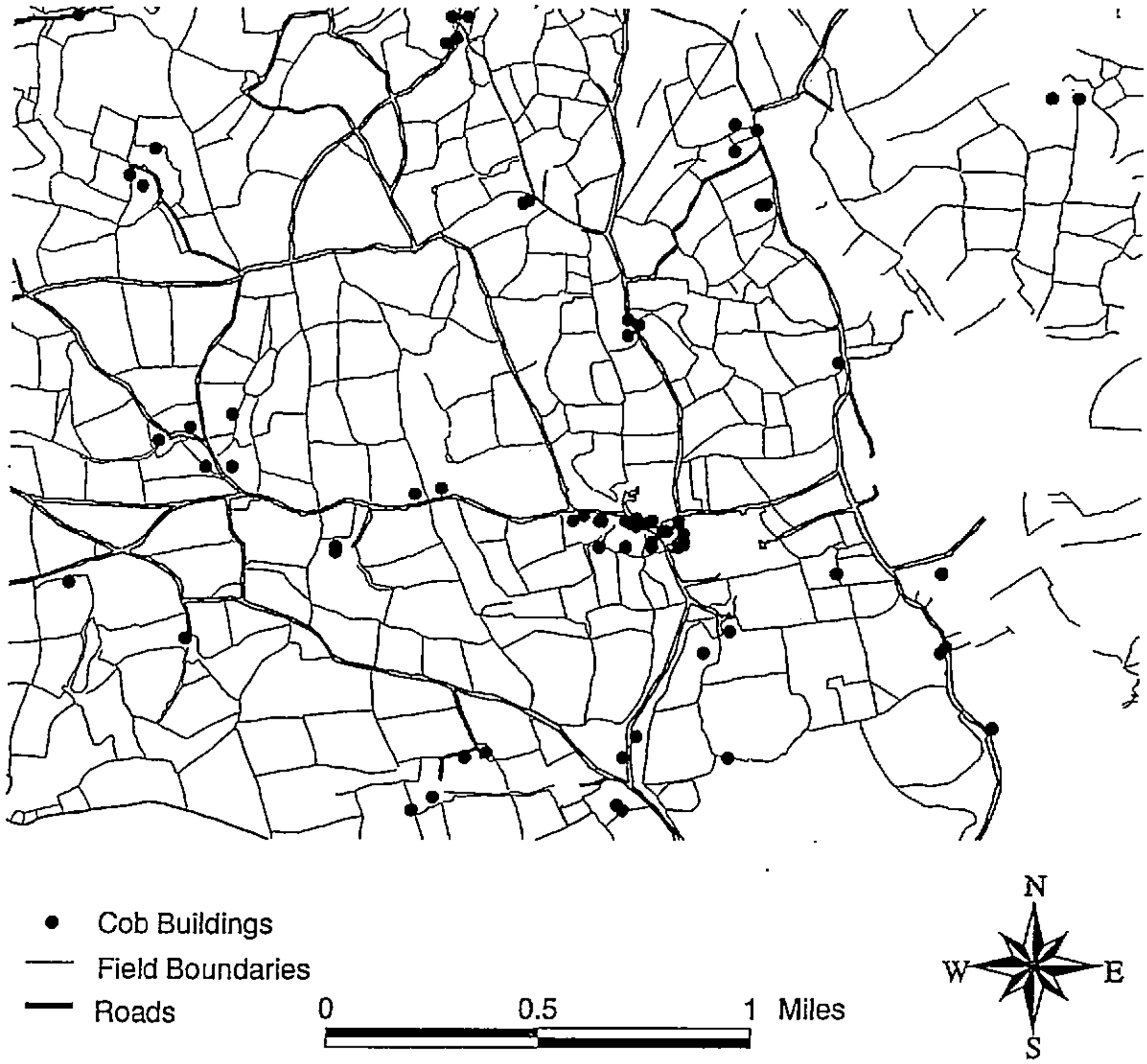

Figure 4 Relationship of cob buildings to roads and field boundaries in part of the study area.

accommodate and integrate spatial as well as descriptive data. Neither are they flexible enough to allow for visual analysis or interrogation of differing datasets.

By using GIS, the potential is available to create an inventory system that allows integration and interrelation of a series of geographically-referenced datasets, both spatial and descriptive, thus increasing greatly the analyses that can be achieved. Patterns and correlations can be observed, and cross referencing between different datasets can be undertaken. Such a data collection system has the capacity to permit the reuse of data for future analytical programmes and provide a simple and expedient method for updating recorded information. It satisfies the RCHME's stated requirement that records should be accessible and simple to duplicate.

In the study area, the analysis of a series of spatial and descriptive

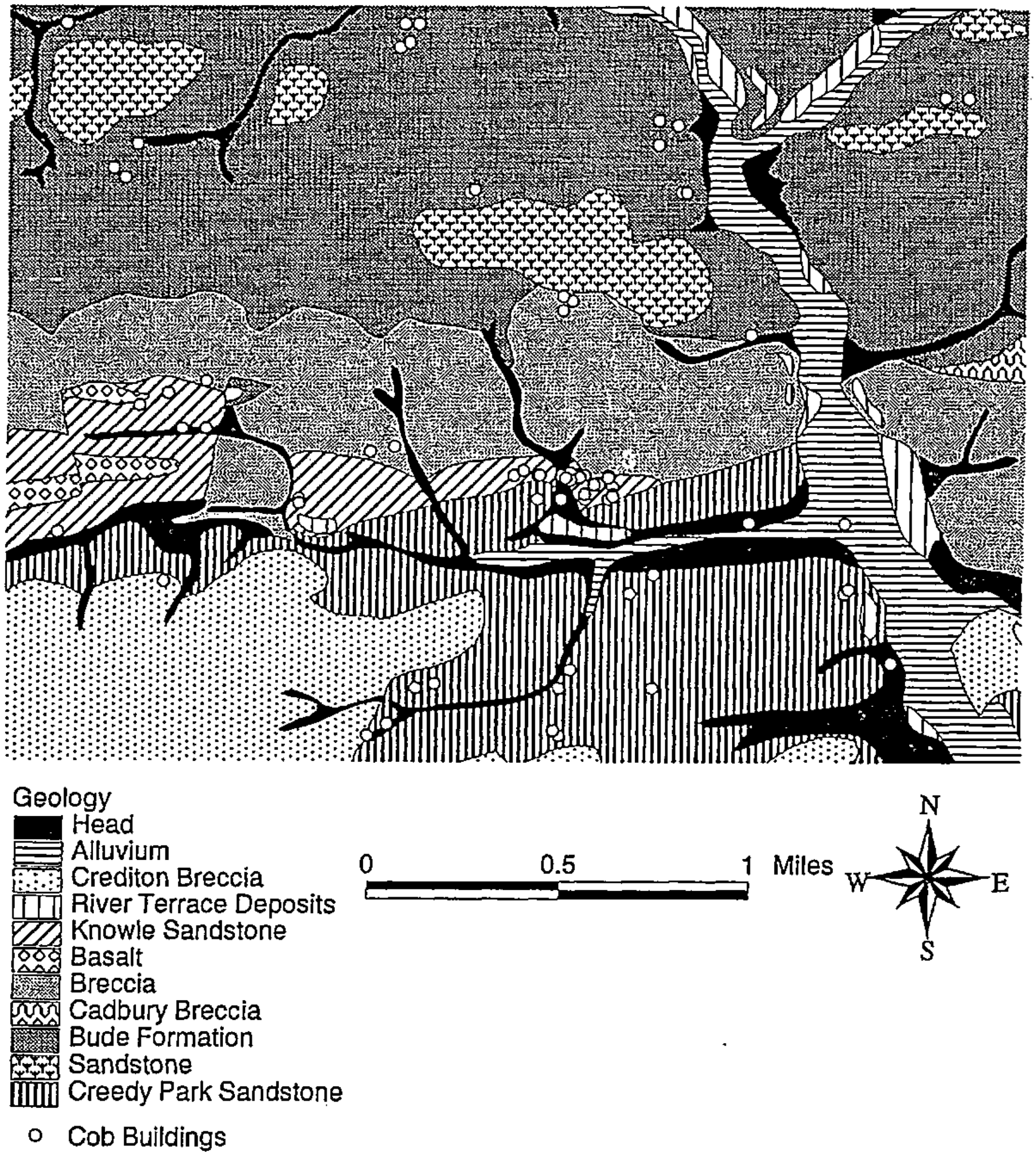

Figure 5 *Relationship of cob buildings to geology in part of the study area.*

datasets allowed relationships between the buildings and their topographical surroundings to be explored. Associations were demonstrated between the orientation of the buildings, their siting in respect of gradient and proximity to fresh water sources, and their relationship to archaeological sites and earlier field patterns. Historical elements that indicate successive layers of occupation.[20] Relationships were also illustrated between the siting of the oldest cob buildings (pre-1600) and the drift geology of the area indicating the importance of the material, head, for construction purposes. Head has been defined as being a synonym of Combe Rock.[21] It consists of angular fragments contained in an earthy mass that has resulted from solifluxion during periglacial

cob buildings but for vernacular buildings in general.

Biography

Margaret L. Ford BSc(Hons)

Margaret Ford is a research student in the School of Architecture at the University of Plymouth. She is reading for a doctorate based on the development of a methodology for preparing inventories of earthen buildings using GIS.

Hisham El Kadi PhD, BSc(Arch)

Dr Hisham El Kadi is a senior lecturer in the School of Architecture, University of Plymouth. He has specialized in the use of GIS for architectural applications and has more than 30 publications in journals and conference proceedings.

Linda Watson BSc(Hons), BArch(Hons), DipArch(Conservation)

Linda Watson is an architect and course director of the PGDip/MA Architectural Conservation course at the University of Plymouth. She is Secretary of ICOMOS (UK) Earth Structures Committee and a member of the Working Group of the Devon Earth Building Association (DEBA)

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A GOOD HAT

From ubiquity to scarcity; from condemnation to conservation. This poster illustrates the writer's quest to discover literary references to building in cob, the traditional west of England method of construction using unbaked earth. References that demonstrate the materials and the techniques used, the estimated costs and the changes in attitude from the eighteenth century to the mid twentieth century. The illustrations show how this once common material was utilised for the construction of a variety ofdifferent building types. From small vernacular cottages and farmbuildings to substantial gentry houses, Picturesque cottages and architect designed country houses.

Carew (1602) Survey of Cornwall

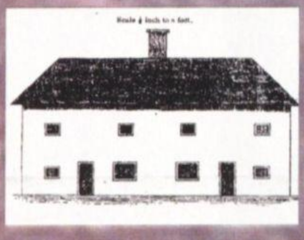
In Carew's Survey of Cornwall (1602) cob and thatch is remarked on as being used for the home of a "poore cotager".

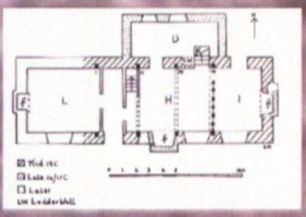
Marshall (1796) Rural Economy of the West of England

"Earthen walls, rough cast, and covered with a reed roof, form a neat and comfortable habitation.........in general, without plan, and meanly built: earth and straw being the chief materials. Even the farm yard fences are of 'cobb'.......if kept dry, it will stand for ever"

Swete (1798) The Gentleman's Magazine

"Devonshire Cob. One would have imagined that a traveller in Devon would not have put to you the query of 'What is cob?'. Let him be informed, that cob is a composition of straw and adhesive loam, incorporated well together by treading, and then put up in layers in the common form of walls. With such materials is almost every farmhouse and village constructed"



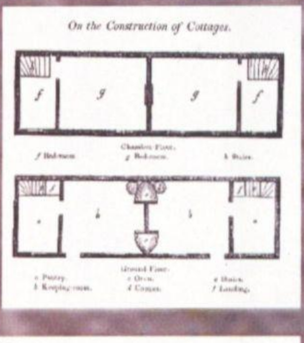


London (1836) Encyclopaedia of Cottage, Farm and Villa Architecture and Furniture

Loudon makes frequent reference to the use of cob. He considers earth to be a more economical material to use for the walls of farm buildings than timber and refers to the cob walls of Devonshire, providing they are built properly and raised on "brick or stone foundations to a height of a foot or eighteen inches above the ground", remaining in good condition for over a century and to be equal to marble in their durability.

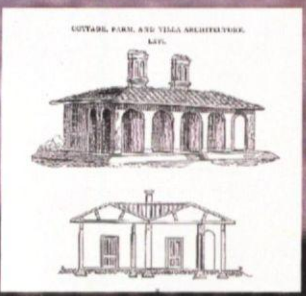
The Reverend WTE (1836)

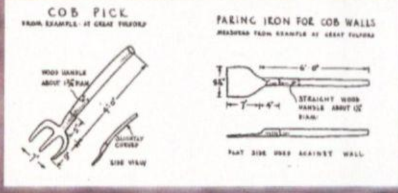
"The solidity of cob walls depends much upon their not being hurried in the process of making them; for, if hurried, the walls will surely be crippled; that is, they will swag, or swerve from the perpendicular. It is usual to pare down the sides of each successive rise before another is added to it. The instrument used for this purpose is like a baker's peel (a kind of wooden shovel for taking the bread out of the oven), but the cob-parer is made of iron. .....In Devonshire, the builders of cob-wall houses like to begin their work when the birds begin to build their nests, in order that there may be time to cover in the shell of the building before winter. The durability of cob is said to depend upon its having 'a good hat and a good pair of shoes;' that is, a good roof and a good foundation".



Joce (1919) Transactions of the Devonshire Association

"Cob - the unrivalled material for a cosy human dwelling; set upon a stone foundation to two feet above ground level; a non-conductor of heat, within doors cool in summer and warm in winter; its comfort is marked by those who compare it with cold stone walls. It is particularly valuable in our damp climate in allowing no moisture to percolate as it does through brick.........Nor is damp-course ever thought of. It loses heat so slowly that a cob wall is the finest support and shelter for fruit trees".





Copinger Hill (1843) On the Construction of Cottages

"One man gets upon the pinning with a small three-tined fork; his partner throws up to him small lumps of clay, the size of a double-fist, which he adroitly catches on his fork, and [illegible] longer; all depends on the weather. When [illegible] requisite height is obtained".

Williams-Ellis (1919) Building in Cob, Pise and Stabilised Earth

Cob - "once the cottage material par excellence of Devonshire and the West of England." For survival two things are quoted as being essential, that the building had dry [illegible]

Vancouver (1808) General View of the Agriculture of the County of Devon

[illegible] comments......."It [illegible] of the [illegible] all expenses of [illegible] of materials and the cob [illegible] manner at about three [illegible] per perch, same measure." In [illegible] cob walls are described as "being eighteen inches thick, one foot high." .....one horse load of straw is mixed and tempered with [illegible] loads of clay, and consequently equal to the building of a four and a half perch of cob of nearly the same thickness as the wall below."

Journal of the Royal Agricultural Society of England (1936)

Housing the Agricultural Worker. The Housing (Rural Workers) Act 1926 stipulated that all bare cob walls should be plastered with rough cast or stucco. The results were described and illustrated in an article in the above Journal. Door openings and windows were altered and dormer windows added. In some cases the affect of the alterations almost entirely disguised the origins of the building.

Laycock (1920) Transactions of the Devonshire Association

"The material called cob, which was in general use in Devon and the surrounding counties for building all classes of houses (except large mansions), wherever the soil was suitable, is composed of earth and straw (barley-straw by preference) mixed together with water, like mortar, by being well beaten and trodden. The treading was usually done by men or boys, but occasionally by oxen. The straw was sometimes chopped up, but more usually merely pulled abroad and bruised with the hands. The earth nearest at hand was generally used, but it had to be a good heavy ooam or clay-shillet, a light sandy soil being quite unsuitable for making cob."

Irish Farmers Journal 1814

"With a compost of moistened clay and straw, without plumb, square, or level, but merely with an instrument they call a sprong (which is a fork with four lengthy prongs and a lengthy hand), every man is capable of erecting a house for himself, compact and perpendicular; executed with such accuracy that the exterior walls are limited to eighteen and its partitions to twelve or fourteen inches in thickness.....the house, when plaistered with a finer preparation of clay, and whitened with lime, looks fully as well as if composed of stone, and excludes the air beter than ill executed walls of that material."

Ecclesiologist (1848)

"The stone wall under the cob ought to be two feet in height from the foundation, to keep the damp off the cob. The cob should project over the stone wall about one and a half inches".

Innocent (1916) The Development of English Building Construction

" The first layer of cob was built two and a half feet high all round the foundation and the walls themselves were two foot thick. The stuff was used as wet and soft as ordinary mortar, and after a week or so, according to the dampness or dryness of the atmosphere, allowed for the layer to consolidate, another layer was put on, and so on until the work was finished, two years being required for a two storied house if it were to be properly done. In Devonshire each course was known as [illegible] ......The walls had a tendency to crack, especially at the corners, and they were generally rounded to avoid this: but this rounding of the corners may have had its origin in early circular or oblong buildings, and been retained for practical purposes. The cob also [illegible] and bulged when the whitewash or plaster with which it was usually [illegible] became decayed, and thus some Devon villages had an extremely dilapidated appearance a century ago.

Journal of the Royal Agricultural Society of England (1863)

"........mud walls are dry and warm but that they are also more susceptible to rodent damage"

& A GOOD PAIR OF BOOTS

M. Ford, R. Griffiths, L. Watson. School of Architecture,
University of Plymouth, Drake Circus, Plymouth, Devon PL4 8AA