The Historical Archaeology of Post-medieval Water Supply in Oxfordshire

Volume I: Text

Thesis submitted for the degree of Doctor of Philosophy

Jill Hind

Kellogg College, University of Oxford

Hilary 2014

Abstract

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This thesis explores the different methods by which water was obtained between the end of the medieval period and the establishment of the contemporary water companies; it shows how archaeological remains can inform understanding of how different groups lived and interacted during that period. It attempts for the first time to catalogue water supply features within the county, having 910 entries to date. Patterns emerging from the data have been used to suggest themes for further study.

Statistics and GIS mapping have demonstrated that the availability and quality of water, including the incidence of early holy and healing wells, are dominated firstly by geology and then by differences between the social classes and between urban and rural areas. Themes explored include the relationship between water and disease, whether water supplies differ between 'open' and 'closed' parishes, the evolution of holy wells into spas, water in leisure activities, its association with memorials and changing attitudes to hygiene.

It also examines the various designation systems in place for protecting historic monuments, the level of recording of water features on local and national lists of monuments and how appropriate this framework is for helping the conservation of a valuable resource.
The survival of water features is best achieved when an individual or group feels a sense of ownership and takes responsibility. A number of recent initiatives are used to illustrate this.
Finally the thesis sets out a number of areas for future research, which would build upon the outcomes of this research and extend them to a wider geographical area.

Summary

The Historical Archaeology of Post-medieval Water Supply in Oxfordshire

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This thesis explores the different methods by which water was obtained between the end of the medieval period and the establishment of the contemporary water companies; it shows how archaeological remains can inform understanding of how different groups lived and interacted during that period. It attempts for the first time to catalogue both extant and lost water supply features within the county, having 910 entries to date. Patterns emerging from the analysis of the data have been used to suggest themes for further study. Previous work in relation to water supply has usually begun with a theory and then sought examples to support the argument.

Although Oxfordshire is the primary focus, occasional comparison has been made with other parts of the UK and with mainland Europe. The time period covered extends to the early 1970s when the large water companies were established, reflecting the slow process of change in water provision. An interdisciplinary approach has been employed, using a wide range of sources, extending well beyond the archaeological.

The identification of water features was carried out through a combination of field work and documentary research, using historic maps, local histories and specialist websites. Further information was obtained through liaison with heritage professionals, local societies and individual contacts. An Access™ database was developed and a GIS programme, MapInfo™, was used to analyse the distribution of features across the county.

The thesis also examines the various designation systems in place for protecting historic monuments, the level of recording of water features on local and national lists of monuments and how appropriate this framework is for helping the conservation of a valuable resource.

Few of the features are Scheduled Monuments or Listed Buildings and the criteria for designation, with their focus on nationally important sites, are difficult to use for water features. Most water features would only be deemed of local importance and are unlikely to benefit from the protection of designation.

At present less than 30% of the sites identified appear on the national and county heritage lists. The current pressure towards local listing may help to address the low level of recognition of water features, although such designation does not bring into force any specific restrictions on their removal.

Management of water began in the prehistoric period with wells and waterholes. Over time the mechanisms employed have increased in complexity. Advances in technology, moving from human and animal power to the use of steam, petrol and electricity for pumping have allowed large amounts of water to be transported long distances and provided in virtually unlimited

quantities to individual homes.

Responsibility for the provision of water also shifted during the post-medieval period. Legislation, relating to public health and changes to the structure of local government for example, has gradually replaced individuals, social groups and private landowners in water supply with centralised, commercial organisations.

The availability of water depends to a large extent on geology. In the north of Oxfordshire limestone, which allows ready access to water, predominates, but in the south the impermeable chalk severely limits it. Early settlement patterns show that water supply was an important factor in the selection of a site, with rivers and streams particular foci. The association of settlement and water is also revealed by place-names. While the majority of the county is characterised by arable farms, nucleated settlement and formal parkland, there are also areas of more dispersed settlement, on the edges of the Cotswolds in the north-west, on the chalk downlands in the south of the county and in the wooded areas of the Chilterns in the south-east.

The water features of Oxfordshire illustrate clearly how much variety there was in the availability of clean water and effective drainage to different social classes until the later 20th century. The cold baths and fountains found at the large estates contrast starkly with the 'village pump' still being provided to supply new council houses in the 1930s. Greys Court had an effective well from the 16th century, while the villages around, sharing the same chalk geology, were forced to collect water from distant rivers until the late 19th century. Differences in provision in open and closed parishes also demonstrate how dependent the lower classes were on the philanthropy and attitudes to improvement of landowners.. The statistics generated indicate that provision was better in closed parishes.
From the later 18th century large landowners did consider the water supply of their tenants, for example by providing pumps in planned villages or by extending piped systems. Where large areas were controlled by single landowners their influence extended to the access of tenants to a reliable water supply, not always to their advantage. The motives for this were probably economic, concerned with efficient farming of their lands and maintaining a reliable workforce. Many more examples of the upper classes providing a water supply can be found and, in many cases, the motive for this appears to be genuinely philanthropic, but the associated obligations of patronage and control of the beneficiaries are unclear. It is much easier to find out who paid for the installation of new water supplies than how maintenance was funded.

Practical difficulties and economic considerations delayed the establishment of good supplies even after mains water became widespread, leaving some houses outside the network to the present day.

There has been a far greater change in how methods of water supply to towns since the mid 16th century than in rural areas. Although Oxfordshire has few large towns, there is nonetheless a good range of examples.

These changes have reflected advances in technology, most significantly the advent of steam-power for pumping stations. The high population densities in urban areas have also put pressure on drainage and waste disposal systems, which were not fully addressed until at least the late 19th century. Incentives for these improvements were outbreaks of diseases such as cholera, where a direct connection to contaminated drinking water was shown to exist. Oxford was one of the few cities where these outbreaks were analysed in any detail, by Sir Henry Acland and others, the findings prompting construction of a new waterworks.

When detailed studies of different types of housing are considered the contrasts are even more marked. In the 19th century evangelical Christians and social reformers began working to improve working class housing, such as the Christ Church tenements in Oxford, and the Temperance

Movement influenced the foundation of the Drinking Fountain Association and Temperance hotels.

Urban water supplies illustrate how municipal authorities gradually assumed full responsibility for water and sewage, which until the early 20th century owed much to private companies and individuals, such as Otto Nicholson of the Carfax Conduit.

Accommodation of indoor water supplies, lavatories and eventually bathrooms into housing designs evolved slowly. Facilities were provided for the upper classes first, but the rate of change for all classes was much quicker in urban than rural areas. Some country house owners preferred to pay for the luxury of servants rather than install bathrooms. An indoor lavatory, even a WC, only slowly came to be regarded as hygienic. As people came to take an unlimited supply of water for granted, attitudes to bathing also changed, assisted by the advertising industry, so that a daily shower is seen as essential by a large part of the population. By the later 20th century the difference between social classes in their ability to meet these expectations had almost disappeared.

Water carries wider significance than mere necessity for survival. It has always been associated with cleanliness and purity, associations which have linked water with religious activities and rituals. During the post-medieval and modern periods this has been manifested in the continued use of holy wells, for both healing and ceremonies. Although Oxfordshire has few wells with genuine pre-Christian origins or even firm links with a particular saint, there has been a considerable number of these features recorded in the county, mainly in limestone areas. Several are still in existence and even attract pilgrims. In the post-medieval period, the church authorities tried to suppress associated rituals, although recently interest has revived. Many holy wells were lost or became part of the supply system, but a few developed into spas, although none prospered in Oxfordshire. Drinking of spa water was common and mineral waters were produced in a number of locations across the county. Blenheim Palace still forms part of the current bottled water industry.

Provision of a water supply has been a popular form of memorial, often dedicated to a particular individual, but also to commemorate particular events such as royal jubilees. The motives of donors are often less obvious, and philanthropy may mask more egoistic aims, such as political influence. Perhaps surprisingly, few war memorials take the form of water features.

Somewhat better represented across the county are the aesthetic associations of water. There are many fine examples within the large estates illustrating how water was used within gardens at different periods. These gardens used water in part as a demonstration of affluence and in part for simple pleasure.

In addition, the designs of post-medieval water sources identified show the influence of broader trends in architectural styles. While it was not possible to attribute a manufacturer to all the features identified, it was possible to begin to identify some patterns in their distribution. The thesis also attempts to identify the provider of features, and to explore their motives. Philanthropy of the donor may have masked other motives, such as political prestige.

Better water supplies also led to increases in the use of water for leisure. Although Oxfordshire's rivers were used for swimming, municipal authorities and private individuals began to construct pools.

Despite the existence of the various historic environment designation and recording systems, it is clear that the survival of historic water features is best served where a particular individual or group takes responsibility for them. Where a feature is ignored, it is vulnerable and likely to be removed. A number of initiatives, investigated for this thesis, suggest a resurgence in use of

historic water sources, for example on allotments. In mainland Europe the older public water sources have often remained in use in both urban and rural settings, albeit with some consideration of modern expectations on water quality. New drinking fountains are also more common on the continent. As population growth and climate change put water supply under increasing pressure, reconsideration of how water is used and alternatives to pure, treated water from the mains will become increasingly important.

Where mains water is not provided it is usually the task of women and children to collect sufficient supplies, still a major issue in Third World countries where charities such as Water Aid are trying to reduce the burden. There is evidence that a similar situation existed in Oxfordshire, continuing into the 20th century in areas such as the Chilterns in its south-west, although there are photographs showing that men did visit wells. Having ready access to water would have reduced the labour of washing and cooking.

Among the threats of climate change is a reduction in access to a water supply for millions of people, possibly leading to conflict. Even now, in some parts of the world water shortage and contamination are responsible for extreme hardship and many deaths, not just during periods of drought or natural catastrophe. In the developed world plentiful, pure water and efficient removal of sewage are taken for granted. Each year individual consumption figures rise and temporary bans on the use of hosepipes or similar control measures cause public outcry. People have a sense that, with centralised providers such as Thames Water, they have lost any influence on how their water is supplied. There are signs from the work of allotment holders that alternative to mains water are now considered seriously.

This thesis has demonstrated the survival of *in situ* historic water features, which can provide a basis for explorations of technology and social history. The database of features is not exhaustive and the themes have scope for additional work. A number of areas for future research have emerged. These include:

Expansion of the database
Many more water features exist than have been identified to date, and not all the districts have been examined in the same detail.

Classification of parishes in the area transferred in 1974
The study classifying open and closed parishes in Oxfordshire did not cover the whole county and the rough classification used here for the remainder of the county needs to be reconsidered.

Detailed study of settlements within parishes
The provision of water supply within parishes, particularly those classed as intermediate, needs to be studied in more detail.

Extension to other counties
The research carried out in Oxfordshire for this thesis does not appear to have been carried out for other parts of the country. Similar studies are needed elsewhere, with which the conclusions for Oxfordshire can be compared.

Manufacturers
An extensive catalogue of manufacturers of water features, their designs and any identification symbols used needs to be drawn up. Few carry a maker's mark and systematic research has not been carried out.

Providers, motivations and access
More needs to be done to record the providers of water features and their motives and to explore funding sources and any associated restrictions on access.

Specific case studies
Many opportunities exist for detailed studies of a specific aspect of water supply, for example provision within the estates of a particular landowner.

Oral histories
Recording of oral histories and other personal recollections should be a priority. There remain limited opportunities to record first hand evidence of how water was obtained before universal piped water and how life was lived.

Raising awareness
Opportunities to disseminate information about water supply in the past and to engage with a range of stakeholders need to be identified and acted upon. Unless the importance of water features is recognised the sense of ownership needed for their protection will not develop.

Sufficient examples of features associated with water supply have been identified across the county to allow patterns of distribution, levels of designation, ownership and condition to be explored, using statistics and GIS mapping. These have demonstrated that the availability and quality of water, including the incidence of early holy and healing wells, are dominated firstly by geology and then by differences between the social classes and between urban and rural areas.

Acknowledgements

Assistance towards the completion of this thesis has been received from too many people to mention individually, but suggestions and information about locations of water features were much appreciated.

Profound thanks are owed to my Supervisor, David Griffiths, who has supported me throughout this undertaking. The opportunity to discuss the work with Gary Lock and Dan Hicks was beneficial and thanks is also due to staff at the Department for Continuing Education for providing training and seminars.

Kellogg College provided welcome opportunities to exchange ideas with other researchers and a support network, particularly Bob Lockhart, my Adviser.
I am also grateful for colleagues at Oxford Archaeology for allowing me flexibility in time commitments and opportunities for field visits. Julian Munby especially has provided advice and information.
Susan Lisk, at Oxfordshire's HER, very kindly not only allowed me access to the HER records, but followed this up by seeking out and sending on to me additional archive material. I am also grateful to Gary Marshall, National Trust, for allowing me to view archive material for the Coleshill and Buscot estates.

I am also particularly grateful to Helen d'Ayala of BBOWT and Karen Woolley of Greenmoor Conservation Trust for involving me in their projects. Kathryn Davies of English Heritage, Gaelle Jolly of the Oxford Preservation Trust and Councillor Nualla Young all gave time to discussing the restoration of the St Clements Fountain with me. I am very grateful to Claire Dunk of Ipsden Parish Council for supplying me with detailed information on the Maharajah's Well Trust.
Finally I must thank all my family and friends who have tolerated my obsession with water features. My particular gratitude goes to my husband, John, for living patiently with this for so long, his willingness to read and comment on the work and his help in surviving the demands of a DPhil.

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Chapter 8

List of Abbreviations

AAI	Area of Archaeological Importance
AB	Abingdon
AD	Anno Domini
ADS	Archaeological Data Service
AIA	Association for Industrial Archaeology
ALGAO	Association of Local Government Archaeological Officers
AMAAA	Ancient Monuments and Archaeological Areas Act
BA	Banbury
BAR	British Archaeological Reports
BBOWT	Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust
BC	Before Christ
BC	Borough Council
BD	Bedfordshire
BE	Berkshire
Berks	Berkshire
BI	Bicester
BR	Bristol
BU	Buckinghamshire
c.	Circa
CA	Cambridgeshire
CART	Coleshill Auxiliary Research Team
CBA	Council for British Archaeology
CCTV	Closed-circuit Television
CD	Compact Disc
CE	Cheshire
CH	Cherwell
CHAT	Contemporary and Historical Archaeology in Theory
Cl	Chloride
CN	Chipping Norton
Co	Company
CPRE	Council for the Protection of Rural England
DCLG	Department for Communities and Local Government
DCMS	Department for Culture, Media and Sport
DE	Derbyshire
DFA	Drinking Fountain Association
DfE	Department for Education
DLTR	Department of Transport, Local Government and Regions
DoE	Department of the Environment
DV	Devon
EH	English Heritage
EHA	English Heritage Archive
ES	Essex
et al.	Et alia
FA	Faringdon
GG	Glasgow
GIS	Geographic Information System
GL	Gloucestershire
GPS	Global Positioning System
GW	Gwent

GWR	Great Western Railway
ha	hectare
HE	Henley-on-Thames
HE	Hertfordshire
HELM	Historic Environment – Local Management
HER	Historic Environment Record
HPR	Heritage Protection Review
ibid	Ibidem
IfA	Institute for Archaeologists
IHBC	Institute of Historic Buildings Conservation
IW	Isle of Wight
JWB	Joint Water Board
km	kilometre
l	litre
LB	Listed Building
lhd	Litres per head per day
LI	Lincolnshire
LO	London
Ltd	Limited
m	Metre
MAGIC	Multi-Agency Geographic Information for the Countryside
MARS	Monuments at Risk Survey
ME	Merseyside
mg	milligram
Midd	Middlesex
MP	Member of Parliament
MPP	Monuments Protection Programme
MSt	Master of Studies
Na	Sodium
NHLE	National Heritage List for England
NMR	National Monuments Record
NN	Northamptonshire
NO	Norfolk
NO_2	Nitrite
NO_3	Nitrate
NPPF	National Planning Policy Framework
OA	Oxford Archaeology
OAU	Oxford Archaeological Unit
ODPM	Office of the Deputy Prime Minister
OFWI	Oxfordshire Federation of Women's Institutes
OPT	Oxford Preservation Trust
OS	Ordnance Survey
OUDCE	Oxford University Department for Continuing Education
OUP	Oxford University Press
OX	Oxford
Oxon	Oxfordshire
pers. comm.	Personal communication
pH	Measure of acidity (1-6 acid; 7 neutral; 8-14 alkaline)
plc	Public Limited Company
PMSA	Public Monuments & Sculpture Association
PO	Powys
PPG	Planning Policy Guidance
PPS	Planning Policy Statement
RAF	Royal Air Force

RC	Roman Catholic
RCHME	Royal Commission on the Historical Monuments of England
RIBA	Royal Institute of British Architects
ROW	Records of Witney
RPG	Registered Park & Garden
SAH	Society of Architectural Historians
SALON	Society of Antiquaries of London Online Newsletter
SAVE	Save Britain's Heritage
SGC	South Gloucestershire Council
SH	Shropshire
SM	Somerset
SM	Scheduled Monument
SMC	Scheduled Monument Consent
SMR	Sites and Monuments Record
SO	South Oxfordshire
SODC	South Oxfordshire District Council
SO_4	Sulphate
SPAB	Society for the Protection of Ancient Buildings
SU	Surrey
SX	Sussex
TH	Thame
TY	Tyneside
UAD	Urban Archaeological Database
UDC	Urban District Council
UK	United Kingdom
UKNIWM	UK National Inventory of War Memorials
US	United States
USA	United States of America
VA	Vernacular Architecture
VCH	Victoria County History
VW	Vale of White Horse
WC	Water closet
WA	Wantage
WA	Warwickshire
WEA	Workers' Education Association
WHO	World Health Organisation
WI	Witney
WL	Wallingford
WM	West Midlands
WO	Woodstock
WO	West Oxfordshire
YO	Yorkshire

1 INTRODUCTION

1.1 Introduction

1.1.1 Water Supply

Water is essential for life; its importance in society greater than subsistence. This thesis studies the development of water supply in Oxfordshire from the mid-16th century to the later 20th century, and demonstrates that the corpus of associated archaeological remains can inform understanding of how different groups lived and interacted during that period. For the first time, in Oxfordshire if not England, the systematic cataloguing of extant and lost water supply features within the county has been undertaken, with 910 entries to date. Patterns emerging from this catalogue have been used to suggest themes for closer examination. Their materiality, the relationships between humans and the material, and the contribution of water supply in broad social questions are all considered. Reference is made to water supply in earlier periods from which the early post-medieval situation had developed and to areas beyond the county border.

In Britain, easy, universal access to water has only been available to every member of society for a very short period; indeed running water and indoor water closets have only been standard in all new houses since the second half of the 20th century.

1.1.2 Background

This thesis builds upon an earlier phase of work in 1999-2000, which the author completed for the MSt in Professional Archaeology. The dissertation (Hind 2000) set out to test the perception that significant numbers of features associated with past water supplies survived, but that the level of recording within the various heritage management schemes did not accurately reflect these survivals. This was found to be the case. Many

were found to be in poor condition, with little correlation between condition, type of ownership or level of statutory protection. Although a cut-off date of 1900 had been selected, during the course of research the late introduction of modern supplies to homes, the 1960s in some cases, became apparent.

Features were rarely in working condition; the troughs associated with pumps often converted into flower beds for example. This contrasts strongly with observations of continental practice. In France, Spain and Germany older features still provide running water, used as a matter of course by the population, even though they usually have supplies to their homes.

It would appear that one of the underlying reasons behind the neglect of water supply features is a lack of recognition of their significance. If more are to be recorded and preserved, there needs to be better understanding of why they might be of value and to whom. The most appropriate mechanisms for ensuring their survival also need to be considered.

1.2 Aims and Objectives

1.2.1 Aims

The principal aims of this thesis are:

- to document the archaeology of water supply, particularly during the post-medieval and early modern periods;
- to demonstrate that surviving features associated with water supply can make a significant contribution to the understanding of social history;
- to investigate how water supply monuments fit into and are protected by existing and proposed Historic Environment legislation, guidance and recording systems;

- to explore attitudes to and perceptions of water supply among historians, archaeologists, historic environment professionals and the public.

1.2.2 Objectives

These aims are addressed through the following objectives:

a) detailed description of the development of water supply in relation to changes in rural and urban society;

b) history of development of water technology;

c) review of water resources as indicators of material culture and lifestyle;

d) discussion of the role of water resources in ritual and tradition;

e) detailed illustration of selected aspects of the themes from a) and b) using specific case studies;

f) detailed study of documentation related to heritage legislation and heritage bodies;

g) detailed study of how the historic environment sector operates in practice, supported using specific examples and interviews;

h) examination of the level of coverage of water resources in literature, both specialist and general;

i) exploration of water-related initiatives within the wider community;

j) identification of areas for future work such as approaches to raising public awareness of water resources.

1.2.3 The importance of water supply features

There are two ways of approaching water supply features: from the evidence of the features themselves and through their relationship to the society within which they were located. The two approaches raise different research questions, although the issues cannot be separated cleanly. The value of physical remains in bringing history to life is well

understood in terms of large monuments such as castles, but the village pump can also help demonstrate the difficulties of life without hot and cold running water.

Water features can be considered a form of material culture, focused on the evidence of the features themselves, which might include:

- evidence for technology;
- aesthetics and design;
- relation to hydrology, geology and settlement distribution;
- materiality, what the choice of material, style and location say about the provider.

The relationship of water features to the society within which they were located can be explored, including:

- organisation of communities, at local, regional and national levels;
- expectations of population;
- health and hygiene;
- industry;
- leisure and recreation;
- religion and belief.

This requires interdisciplinary study as neither approach can be addressed purely through archaeological evidence and, indeed, the materiality of water supply could be considered more naturally the preserve of social and local historians. Aesthetics and design might be addressed by architectural historians, while issues related to technology come within the traditional compass of industrial archaeology, although that discipline has now widened to embrace the industrialisation of societies. Landscape archaeology and historical geography also have a contribution to make.

It is through the approaches of historical archaeology that the potential of water supply can best be explored. Historical archaeology emerged originally in the United States where it has proved valuable in the study of groups who are either partially or completely un-represented in the documentary sources, such as African-Americans. The discipline uses the evidence from everyday objects in conjunction with the documentary record to help develop an understanding of everyday life. Conflicts are frequently identified within the records, for which different explanations can be suggested and tested against the evidence.

In this study reference is made to sources from all these different disciplines.

There is tremendous scope for research within these headings and it is impossible to cover all of them in detail. Some of the factors for selecting the key themes are discussed below.

1.2.4 Research questions

Archaeology of Water

Development of water supply from the prehistoric to the early modern period

Early settlement locations were partly determined by the availability of water and tended to be close to rivers and streams. However, archaeological excavations have demonstrated that wells were also used from the prehistoric period onwards, at Yarnton for example (Lambrick & Robinson 2009, 267). More sophisticated Roman water technology has also been excavated. Dipping wells, springs, ponds and rivers all continued to be used into the post-modern period, but the labour of collecting water was eased by the introduction of winches, mechanical and hydraulic pumps. Large scale water supplies existed from the medieval period, but their importance grew with the

introduction of steam power in the later 19th century. Surviving features illustrate the ranges of technology and help in developing a chronology of change.

Regional patterns in the design of feature chosen or manufacturer used

Across South Oxfordshire and into the adjoining counties a very large proportion of surviving well mechanisms was manufactured by the firm of Wilder in Wallingford, from the 1830s into the early 20th century (Dewey & Francis 1983). Pumps from some large manufacturers can be identified by their particular designs, including street taps with water emerging from a lion's mouth. These manufacturers were not always local, choices being made for reasons of cost, technical innovation or just familiarity.

Relationship between water supply, the geology of an area and its social organisation

Where geology ensures an abundance of springs or streams it would appear easy for individual households or small groups of inhabitants to obtain water. In Blewbury on the spring line of the chalk ridge in South Oxfordshire most houses had a shallow well, while people living on the chalk itself had to wait until the late 19th century before wells were dug. There is a question whether people were always free to use the natural resources or whether landowners controlled this. Levels of control over population in the open/closed parish system may be reflected by access to water and the distribution of types of water supply may correlate with geology.

Design of structures and wider architectural and artistic trends

Gothic and Arts and Crafts styles seem to predominate in post-medieval water features, although classical columns and marble also make their appearance. The Egyptian House near Hartwell in Buckinghamshire (BU001) and the Maharajah's Well at Stoke Row (SO010) illustrate popular fashions of the period.

Water Supply and Society

Control and funding of water supply

Until the 19th century there was little legislation requiring provision of clean water for households. There are numerous examples of the wealthy, both secular and religious, having good supplies from an early date, but their tenants were not well provided for. Within closed parishes, including the model villages, the quality of housing provided during the post-medieval period was improved and often there was an attempt to provide water, either through a communal well or the fitting of collection tanks in roofs or basements. Funding of village wells and pumps mainly came from landowners with an interest in maintaining their key workers or the improving gentry whose patronage was not without strings, as well as a few instances of genuine communal activity.

Gradually power over water supply passed from individuals to the local authorities.

Difference in provision between urban and rural areas

Although most people relied on wells, streams and rivers in urban areas right into the post-medieval period, the provision of municipal water supplies began with medieval conduits in bigger towns, often associated with monastic houses. There is no evidence that any of the Oxford religious houses were keen to share their supplies. The municipal supplies were not generally available without some charge or control over access, which deterred many from making use of the facilities. In Oxford the various schemes from Nicholson's 17th century conduit (OX016) onwards had a low take-up until the law changed to allow rates to be levied. Provision by urban house builders was generally poor; even in the tenement blocks erected by philanthropists, communal taps were more usual than one for each flat. One source of free water was the facilities sponsored by the Metropolitan Drinking Fountain Association, in part motivated by the temperance

movement.

In rural areas there were few large scale projects to supply water although farmers, like the one at Tackley (WO003), sometimes established one for their estate. However, the rural population was much more likely to obtain healthy water from springs and rivers than were town dwellers. Where deep wells were needed, for example on the chalk of South Oxfordshire, it was late in the 19th century before villages obtained them.

Public health issues and the provision of water

The cholera outbreaks of London and Oxford in 1831-66 led to an awareness that the provision of water and the disposal of sewage and other waste should be kept distinctly separate. In Oxford a new municipal water system was constructed, incorporating filtration.

Industry and its water supply, and the effect on domestic supplies

Industrial processes did not just use water as a source of power through water wheels or steam, but in many instances the process itself required large quantities of water, e.g. brewing. In addition there were requirements for the welfare of workers. Some manufacturers had their own wells or boreholes, but others relied on direct abstraction from the river or used the same supply system as domestic consumers. When water was short the two types of user came into conflict with attempts at rationing favouring industry. The waste products from industry also had an impact on domestic consumers. One major user of water is the canal system, which requires a system of reservoirs. It is also the case that water mills were used to supply domestic water at the same time as grinding corn etc.

Water use in relation to leisure and recreation

Ornamental ponds and fountains have a long history. Rousham Park, Buscot and Blenheim Park all had elaborate systems for supplying their water gardens, with several instances of the mechanisms also being used to provide water for more mundane purposes. Spas were popular during the post-medieval period, although none were established in Oxfordshire and only one, briefly, at Dorton in Buckinghamshire. Swimming pools were more common, early ones often occupying the same premises as public baths. Turkish Baths, e.g. one in Hythe Bridge Street, Oxford (OX117), combined hygiene and recreation.

Water features in religious and ritual practices

The part played by water in rituals during the prehistoric to early medieval periods lies largely outside a thesis concerned with the post-medieval period. The holy wells are often thought to be pagan or early Christian survivals, but the picture is much more complex and the definition of a holy well quite fluid. There are wells associated with saints and healing across Oxfordshire, but some seem to have started as roadside wells and many were unknown until very late in the post-medieval period. Although not on the same scale as the Derbyshire well-dressing, the county does have modern rituals linked to wells, like the liquorice wells of Wychwood Forest and the Whitsun processions. Resurgence of interest in pagan religions has revived interest in some of these early wells.

More significant is the part played by water features as memorials. Drinking fountains and pumps are often erected as war memorials, to commemorate individuals and groups or to commemorate a particular event, most commonly Queen Victoria's jubilee, for example in St Clements Oxford (OX005).

Recording and preservation

Limits of Scheduling and Listing

Criteria for designation under these systems cannot necessarily be met by a monument such as a pump or well. Scheduling under the original Ancient Monuments Act 1882 was restricted to prehistoric features, but the criteria have changed to include a broader range of monument classes. The original criteria for Listing Criteria were not clear, favouring pre-1725 structures, but younger ones with a reasonable level of survival could meet them. English Heritage has been slow to accept later features.

Underrepresentation of water supply features in the record

When they were established, HER records were based on record cards produced by the Ordnance Survey and until relatively recently did not include buildings or industrial archaeological features, which excludes a significant number of features associated with water supply. The position has changed with EH now supplying Listed Buildings data to HERs, although these records are still maintained separately within the EHA. Industrial archaeology is also becoming better represented in the records. However, additions to the record come primarily through archaeological investigations. There is very little scope, in finance or time, for any systematic approach to recording standing features such as pumps through fieldwork or map regression for example.

Low levels of designation and recording: a reflection of the attitudes maintained by those responsible for the process

The above considerations may explain attitudes which could produce a negative approach to considering water features. As well as lacking the resources to do the work, many HER officers do not feel confident in the building field and are less familiar with post-

medieval and modern material than with earlier archaeology. A catalogue of Listed Buildings was devised by the former RCHM(E) after a major programme of building survey prompted by the bombing of World War II. Apart from a review initiated in the early 1980s by the then Secretary of state for the Environment, Michael Heseltine (Doggett 2007), additions to the lists have been made on a piecemeal basis. Listing is currently within the remit of the Conservation Officer at local level and the architectural value of a structure is perceived as more significant than its historical association. Scheduling received considerable attention in the 1990s when the Monuments Protection Programme (MPP) was established, but this is mainly concerned with reviewing existing designations. The lack of understanding of industrial remains, including those associated with water, was acknowledged by the production of a series of guides by English Heritage, but the one on the water industry was a disappointing document which concentrated on large-scale systems.

Water features such as pumps and wells are often not considered as archaeology, but part of local history. Since local and social historians are more often concerned with the documentary record, the standing structures continue to be neglected.

Impact of changes to heritage legislation on the position of water supply features

The key proposal of the Heritage White Paper, which failed to progress through parliament, was the replacement of the existing bipartite system of scheduling and listing by a single register of monuments and buildings, a version of which was produced as the National Heritage List. Other proposals, for example to encourage development of a local register, an enhanced HER with locally listed buildings alongside the national register, have nevertheless been adopted. There has also been a review of the criteria for listing, which are coming into use despite the fate of the legislation. These criteria update guidance on what later features should be considered and there is also a set of advice

notes, prepared for different topics. Water supply is the subject of one such, and there are cross-references to other advice notes, like the one on ornamental sculpture.

These changes appear to make it easier for minor features such as pumps to achieve recognition. Descriptions are expanded and the significance of a monument forms part of these.

Comparison of Britain and mainland Europe with respect to working features

Even where features have been restored or newly erected, for example as a millennium project, few of them are useable and many have been converted for other purposes, in stark contrast to the situation in France, Spain and Germany. In France street features are often clearly labelled as being for human consumption or not, sometimes on opposite sides of the same structure. There appears to be a reluctance on the part of British people to use communal facilities, but it may be that environmental authorities are unprepared to undertake the task of testing or local authorities unwilling to fund their maintenance. Some evidence for testing, albeit of private provision, has been identified. In Blewbury most of the older houses have their own wells and there is a six-monthly testing regime through the Environment Agency.

It is not possible to tell from the sites to what extent the continental sources are fed by water which has not received a full treatment regime, but the French labelling and a plethora of urban facilities suggests that untreated water is not the norm.

1.3 Previous Work

1.3.1 Introduction

In 2000 a dissertation '*Monuments at Risk – an Assessment: pre 1900 public water*

sources and supplies in Oxfordshire' (Hind 2000) was submitted for the degree of Master of Studies in Professional Archaeology. The basis for the study was the author's perception that there were large numbers of surviving features associated with early water supplies and that these were underrepresented in official records. This would suggest that the importance of this area of vernacular archaeology is not appreciated and that the under-protected features could be destroyed through neglect, development or decisions based on fashion and personal style and without adequate recording.

1.3.2 Aims and Objectives

The dissertation had five aims, which gave rise to a list of eight objectives, as listed below.

Aims

Principal

1) To review the history of legislation and systems for the protection and recording of cultural heritage in England, identifying strengths and weaknesses in their coverage;
2) To assess the level of protection and recording of a particular group of remains and use this as a measure of the efficacy of current systems;
3) To suggest strategies for future action at a local level and desirable improvements on a wider scale.

Supplementary

4) To describe the history of water supply in Oxfordshire before 1900 and identify the location of associated features;
5) To discover through field visits the state of preservation of physical remains of water supplies and systems.

Objectives

1. To find out whether the author's perception of a low level of recording is justified;
2. To identify any relationship between condition of sites and their ownership;
3. To evaluate a hand-held Global Positioning System (GPS) as a tool for field work;
4. To comment on features which have been lost;
5. To assess the importance of the remains as a resource;
6. To propose strategies for dissemination of information;
7. To promote the involvement of local communities and organisations;
8. To suggest possible areas for further study.

1.3.3 Parameters

The work done in 1999-2000 concentrated on the public water sources in Oxfordshire which were constructed before 1900. The geographical extent was fixed in order to produce a manageable area, although the 1974 boundaries of the county were used, rather than those in place before 1900. A significant area of Berkshire was transferred to Oxfordshire in the 1974 local government reorganisation.

The date of 1900 was also chosen to control the extent of the project. The term ‘public’ was quite difficult to define, but was taken in this instance to refer to systems intended to supply a group of users, rather than an individual household. Neither of these two parameters was ultimately strictly applied.

The parameters used for this thesis differ in some aspects from these, as discussed in Section 1.4.6.

1.3.4 Methodology

Literature Search

Published sources, documents held by local museums and record offices, internet sources and historic maps were all consulted. This strand of investigation was designed to identify possible locations of features and to help formulate the history of water supply and of heritage protection legislation.

Local Organisations

All relevant local societies listed for Oxfordshire were contacted for information about surviving water features in their areas. The results of this exercise were varied, from no reply to invitations for guided tours.

National Bodies

Contact was made with a number of national organisations who might have been expected to have some interest in water features from particular periods, but generally this was not a productive line of enquiry. Only the Drinking Fountain Association (see Chapter 6) was able to supply any useful information, both on sites and the history of water supply.

Heritage Record Systems

Searches were requested on the records held by English Heritage in Swindon to identify any features which are or form part of Scheduled Monuments (SM), or are recorded on the National Monuments Record (NMR), now the English Heritage Archive (EHA). The Oxfordshire Sites and Monuments Record (SMR), now the Oxfordshire Historic Environment record (HER), was visited to obtain a list of features included in that record. Information on Listed Buildings was less readily available. Requests were sent to all the District Councils for lists of water related Listed structures in their areas, but not all

replied. The copies of the 'greenback' lists issued by the Department of the Environment kept in the Centre for Oxfordshire Studies proved more reliable. Since 2000 the National Heritage List has been published and made available online by English Heritage, improving access to reliable data.

As always there were some difficulties in matching records from different systems arising from differences in the precision of grid references and variation in the names used for locations and features.

Field Work

The locations of features identified from a full range of sources were visited. Where the feature still existed, it was photographed, details of its appearance and condition were recorded and a grid reference was obtained. In the course of visits to known locations several previously unrecorded additional features were found and added to the catalogue.

Database

An Access™ database was set up to contain details of each of the features identified. All features appearing on the SM, NMR, SMR and Listed Buildings records were entered, whether or not they were visited. Other sites were only added when they had been seen. The record included for each site seen, an assessment of its condition on a scale of 1-5 and a grid reference obtained using a handheld GPS.

Personal Contact

Informal discussions in social settings and chance encounters during field visits proved a useful source of information on the location of water features.

1.3.5 Results

During the fieldwork phase, not all features recorded on the official lists or in documentary sources were inspected. This was due to a combination of restricted access to private land, poor survival, inaccurate location information and the constraints of time and geographical area within the lifetime of the project. However, just over 100 sites were visited with locations spread across the whole county from which 100 were selected for statistical study. Of these, 66 were not already included on any official list.

District	SM	LB	NMR	SMR	None	Total Sites
Cherwell		2		2	23	27
Oxford		3			4	7
South Oxon	1	4		2	11	18
Vale	1	7	1		16	25
West Oxon		9		2	12	23

Table 1.1: Distribution of Sites per District, by Level of Protection

The majority, 54, were under the care of a local authority and 39 in private hands, with the remaining 7 maintained by a national or regional body. This pattern is likely to have been distorted by the relative ease of access to features in public care.

The features recorded fell into a number of categories, although wells and pumps represented the bulk of the sample.

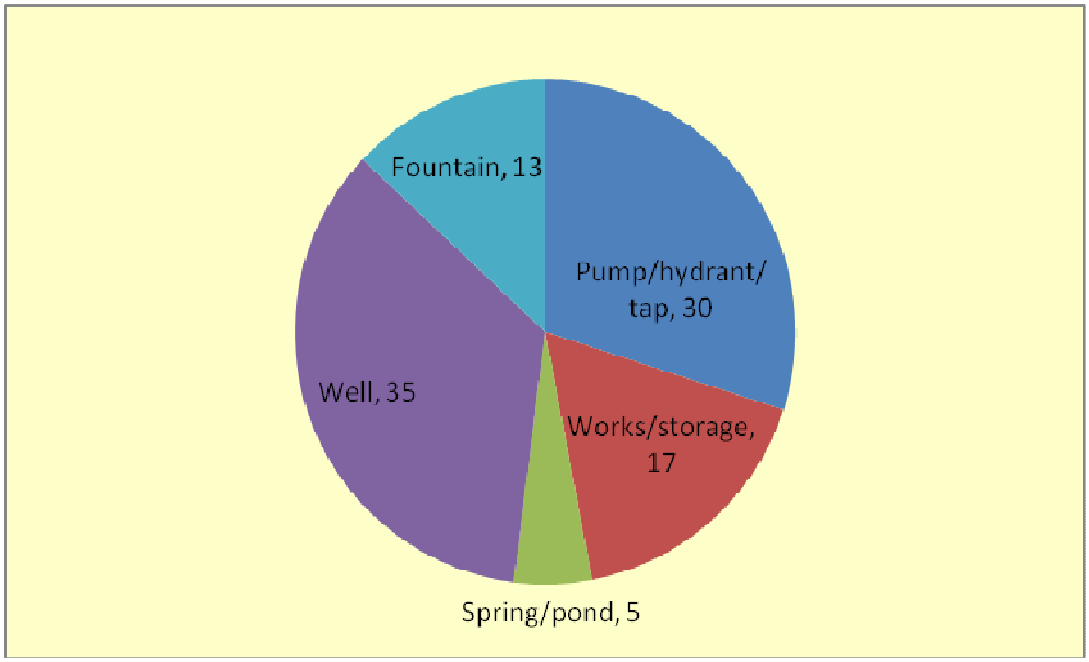


Figure 1.1: Distribution of Sites by Type of Feature

Sites were graded for their condition using a six point scale:

Score 1: 80% or more original condition, in working order

Score 2: 80% or more original condition, not in working order

Score 3: 40 – 80% original condition

Score 4: <40% original condition; seriously compromised, original location

Score 5: Fragmentary remains, location only, related features

Score 0: Nothing remains

For the purposes of the survey sites which merited Score 0 were not included in the sample.

The relationship between the condition of monuments, their recording level and their type of ownership was less clear. Private owners appeared the least effective.

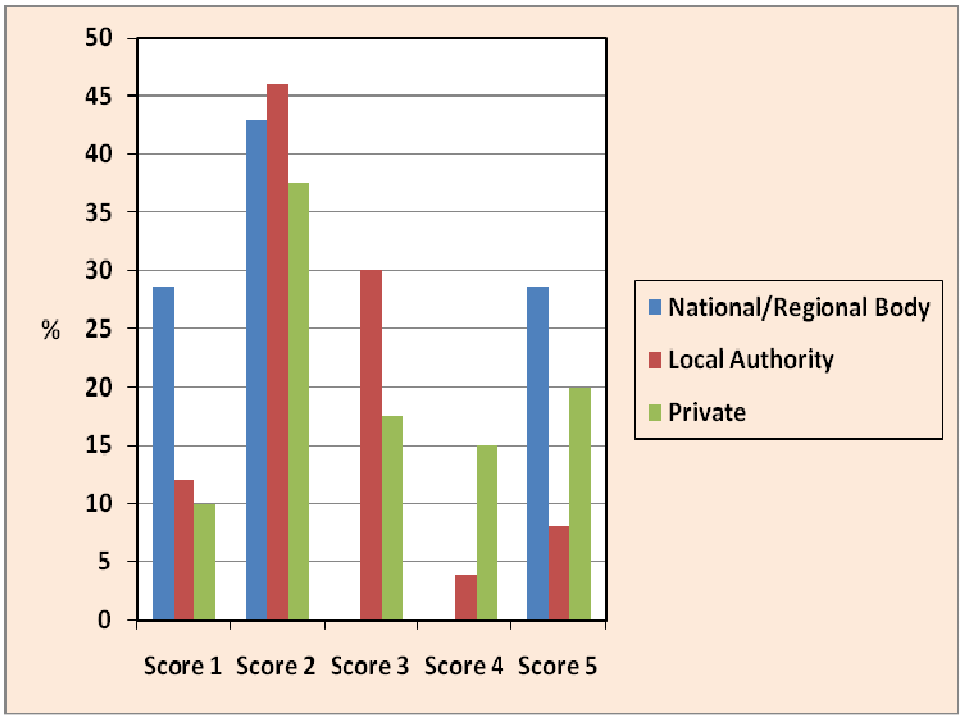


Figure 1.2: Condition Scores by Responsible Body

For unrecorded sites in all types of ownership, the distribution across the different scores for condition was very similar to that for recorded sites.

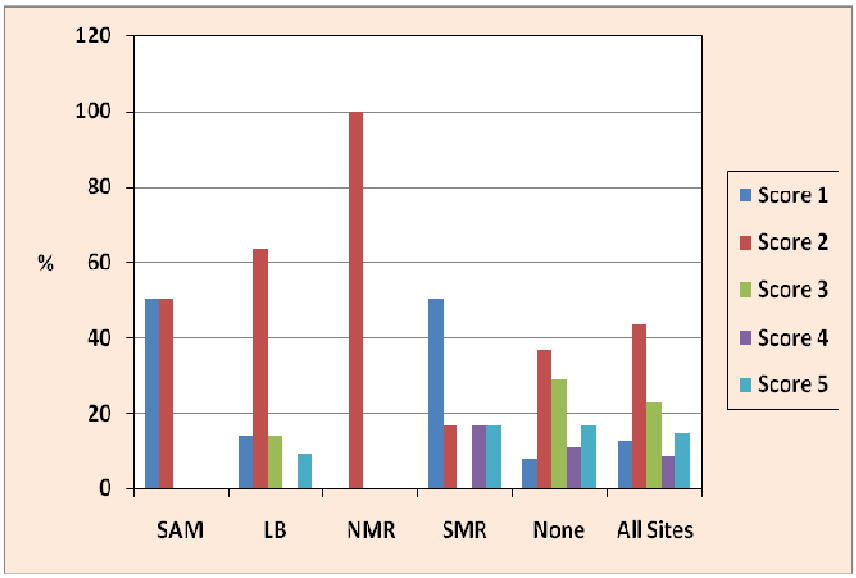


Figure 1.3: Condition Scores by Level of Recording

Water storage and processing features have the poorest level of survival, reflecting changes in technology and public health considerations. Natural features survive fairly well even where they have fallen out of use as water sources. The ornamental elements of many wells and fountains are probably responsible for their higher scores in comparison to the more functional pumps.

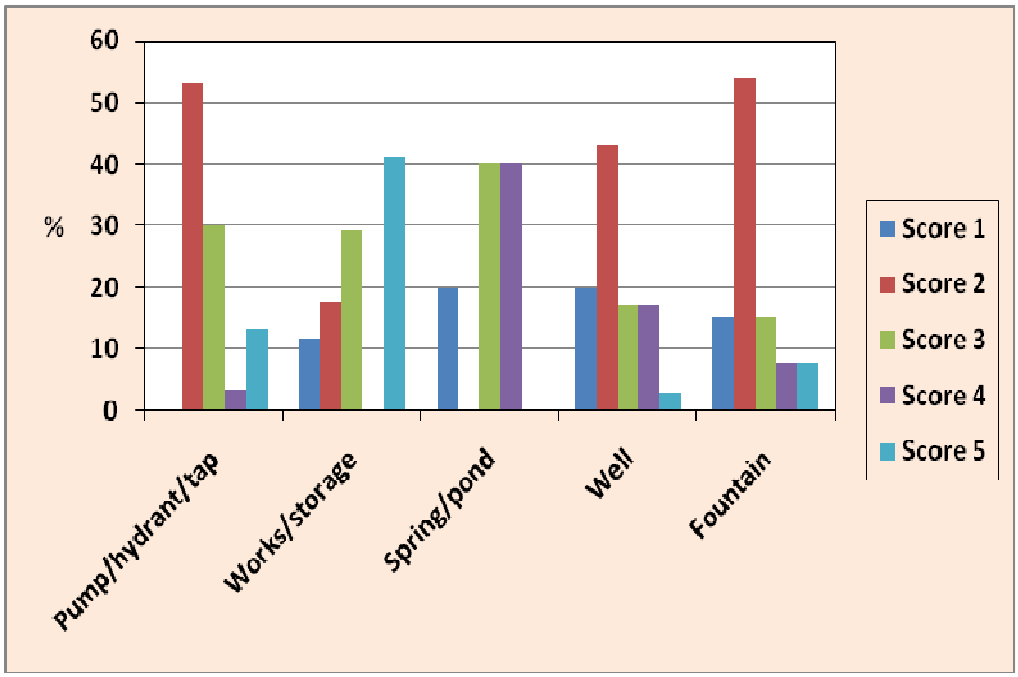


Figure 1.4: Condition Score by Type of Feature

1.3.6 Conclusions of MSt

This study concluded that, as had been suspected at the beginning of the work, the number of surviving features related to water supply was much greater than the number which had either been afforded some degree of legal protection or were recorded on existing lists of sites of interest to the historic environment.

When the results of the condition assessment were compared with the level of protection or recording, no relationship could be determined. Similarly, no clear relationship between condition and the type of ownership emerged, although there was some

indication that private owners were the least careful. Attitudes to the importance of features appeared to be the most important factor, illustrated strongly by the Maharajah's Well at Stoke Row, where a Trust has been established.

Contact with a number of local societies and observations in the field revealed that an interest in water features does exist. The Millennium provided an opportunity for restoration projects and inclusion of water in exhibitions on village history. Blewbury provided the most striking example of this, with Water Aid selected as the focus for the village activities.

1.3.7 Assessment

The project was successful in confirming the existence of a substantial number of unrecorded surviving features associated with early water supplies. It did not begin to do justice to the scope of the topic of early water supplies, but did clearly identify areas which merit further more detailed research. The literature search, database and other research carried out in 1999-2000 provide a basis from which this thesis has been built.

1.4 Methodology

1.4.1 Evolution

Many of the techniques applied in 1999-2000 were utilised for this study, but adapted to fit its different aims. For the MSt the main purpose of fieldwork was to confirm the existence of sites and assess their condition, but further research was limited to checking ownership and any existing level of protection or recording. There was no opportunity or intention to explore the history of individual features. Similarly the complete loss of a feature generally meant that it was of no interest unless of sufficient importance to feature in the brief overview of Oxfordshire's water supply.

Although the intention of this study is still to concentrate on surviving features, particular themes are explored and, where an individual feature is known to have existed, the information can be used to help support an argument. Hence, the accounts contained within documentary sources, particularly the VCH or historic maps, will be used if appropriate even when no field visit has been possible.

1.4.2 Data Set

The underlying foundation for this work is the set of water supply features and sites which have been identified and recorded, both through documentary searches and fieldwork. The majority of these are sites where some evidence still survives. Information on the sites is held in the Access™ database originally developed for the MSt, but expanded as described in Section 1.5. The original data set has been added to on a continuous basis since 2000 as opportunities arose, but since 2005 a more systematic approach has been adopted. However, the creation of an enlarged data set has never been a focus of this research and does not form one of its aims.

1.4.3 Sample selection

The basis of the sample was generated for the MSt, and has been added to continually since, expanding from just over 200 sites to a total of 910. The original sample all came from Oxfordshire and the expanded dataset is concentrated on Oxfordshire and its immediate environs. This provides a manageable area, convenient for field work and for access to documentary sources. In addition, Oxfordshire has range of geologies arranged in bands, making comparisons straightforward.

The initial sample was collected more or less at random, although it was designed to ensure fairly even coverage across the different local authority districts.

A number of drivers have affected the directions chosen for the expansion of the dataset:

- chance – where features have been encountered by accident or during visits for other purposes, these have been recorded;
- use of existing studies – particularly relating to the classification of open and closed parishes, where aspects of the relationship between societies and their water supplies are seen e.g.
  - Flora Thompson's biographical book 'Lark Rise to Candleford' (Thompson 1954),
  - Havinden's study of Ardington and Lockinge (Havinden 1999);
- deliberate targeting of areas to address particular questions – e.g. selection of areas around large estates such as Nuneham Courtney, Blenheim, Buscot;
- need to provide enough examples to make conclusions and trends valid - enough clear examples of open and closed parishes, preferably groups of adjacent parishes;
- size of sample needed to make conclusions valid – where possible statistics are produced in support;
- use of more distant examples to illustrate particular points e.g. medieval provision for the ordinary population as well as the elite or to address issues where no local examples survive –e.g. late 19th century waterworks.

1.4.4 Recording and Protection

The issues of levels of recording and protection are addressed through the following approaches;

a) Detailed study of documentation related to
   - laws and statutes;
   - government guidance: national, regional and local;

- roles of heritage organisations e.g. English Heritage (EH), amenity societies;
- recording and listing programmes e.g. Monuments Protection Programme (MPP), HER.

For the legislation both the past, current and proposed framework will be considered.

b) Detailed study of water resource monuments currently designated as SMs or Listed Buildings and a wide selection of undesignated monuments. This includes the monuments themselves and related documentation.

c) Comparison of the information obtained for a) and b) to check to how legal frameworks have been applied and the criteria used. The existing regimes are compared with recent developments in legislation, including the proposals for a radical review included in the abandoned Heritage Protection Bill drawn up under the last Labour Government and changes to planning policy.

d) Investigation into how the framework operates in practice through interviews with Cultural Heritage Professionals at National and County level, such as EH Inspectors, HER Officers, Local Authority Conservation Officers.

e) Selection of more detailed case studies of particular monuments, including examples of the different levels of designation and recording e.g. North Hinksey Conduit House (VW020), Maharajah's Well (Stoke Row) (SO010), Woodeaton Water Tower (SO001).

A range of examples is used within each of the various categories of designation and management – SM, LB, included within the NMR and/or HER, in Conservation Areas, maintained by Trusts and charitable sponsors, subject to local agreements.

1.4.5 Sources

A wide range of different sources was examined, including:

Maps

Historic, geological and contemporary mapping were used to identify sites of existing and lost features and to investigate the changes in the surrounding environment. Access to maps was facilitated by Edina, a web-based system to which the University of Oxford is a subscriber.

Published and grey literature

Documentary sources were used extensively including the theoretical background to the relevant academic disciplines, studies of particular topics and local history sources.

The Internet is an increasingly useful resource, providing access to datasets, mapping, images, contact details, official publications and journal articles as well as acting as a source of information.

Interviews

Site owners, heritage professionals and those responsible for water-related initiatives were interviewed, sometimes during site visits.

Field work

Field visits were made to meet interviewees, verify the existence of sites and gather further details , which sometimes allowed chance finds of new sites.

Photographs, drawings, paintings

These are a useful source of information on lost features and how they were used.

Newspapers

Recent newspapers often carry 'nostalgia' pieces, some of which relate to water supply. They are also useful for identifying ongoing projects and people's attitudes.

Documentary records

Detailed records from museums, record offices, libraries and the archives of organisations and properties were studied to provide more details about particular water supply features.

The types of sources relevant to particular strands of research are discussed in more detail in Chapter 2. In addition the author was volunteered information by a number of individuals, often as a result of hearing about the work in social contexts.

1.4.6 Parameters

As discussed in Section 1.3, the MSt in 2000 (Hind 2000) used a set of parameters for the dataset, including public water supplies, pre-1900, Oxfordshire boundary. In practice these were found to be inappropriate and have been modified. The revised parameters are given below.

Public and private facilities were considered, predominantly the former. Information about supply to private homes was needed to make comparisons across social class, locality etc., but no attempt was made to gain access to private homes except through invitation.

A cut-off date of 1974 was selected. This corresponds with the establishment of major water companies. The late provision of mains water to private houses, often post World War II, was an unexpected discovery in 1999-2000, resulting in the inclusion of the 20th century in the post-medieval period.

Surviving features were identified and used where possible. Excavated evidence is only used to illustrate general points, and therefore there is little on Roman or earlier features except in context of continuity of use, or background to early settlement patterns, organisation of communities etc. Similarly lost features are used where they contribute to a wider discussion.

Only water supply features from Oxfordshire and its immediate environs were included wherever possible. The post-1974 county boundaries were used, but some areas to the south of the county, which were transferred to Berkshire at various dates within the 20th century, were included. The chalk areas of the Chilterns for example form a coherent area for study, but not all of these lie within Oxfordshire. Examples from a wider area are used as needed to ensure a continuous narrative in the main themes, for example municipal water systems need to be included, but there are no good local examples. Other elements of water supply such spas etc. which cannot be found locally are only mentioned in passing. Examples of water supply features from other parts of the world, mainly in Western Europe, are used mainly in the discussion of differences in attitudes.

1.4.7 Database

The project database was designed to contain basic information about each feature recorded, with sufficient additional information to generate statistics to illustrate the research questions identified. These have been completed for the sites identified in the previous work.

For each site a standardised set of data was recorded:

Site Number;	Level of protection/recording;
District;	Date;
Parish;	Assessment of level of survival;
Place;	Ownership;
Name of feature;	Description;
Type of feature;	Reference;
Grid Reference;	Site Category;
Type of parish;	Geology.

A photographic record was made, mainly from pictures taken by the author during site visits. Additional images were supplied by contacts or were collected from documentary and online sources, which was of particular value for inaccessible or lost features.

Each of the 910 sites identified was given a unique Site Number. The numbering system was arranged with separate lists for each District, distinguished by the prefixes CH, OX, SO, VW and WO respectively. Separate database tables have been created for sites from other parts of the UK and for those from the rest of the world, with their own numbering.

Since 2000 the availability of data on Scheduled Monuments and Listed Buildings has improved, through internet access such as *MAGIC* and the *National Heritage List*, the latter including more precise grid references. All LBs identified in 1999-2000 were included within the dataset and attempts made to match them with HER records and sites discovered in the field. The cross-matching has been checked to see whether errors and omissions had been made.

During the previous study sites were only included on the database if they had already been recorded on one of the official systems, discovered during field work or for unrecorded sites been the subject of a field visit, even if this had failed to find evidence for them. More unrecorded sites identified from documentary sources have been added to the database during subsequent work, including some known to have been removed, in order to support discussion as explained in section 1.4.1.

One table within the database lists all Oxfordshire parishes with their type, even if no information about their historic water supply has been collected. This information helps to identify likely areas for further investigation to test the conclusions of this research.

1.4.8 Structure of thesis

The thesis comprises eight chapters, supplemented by additional background information.

Chapter 1 establishes the background to the selection of the research focus and sets out its aims and objectives. The results of previous work carried out by the author are summarised and limitations discussed. The chapter then describes the methodology employed in obtaining the data from which the various research questions identified are addressed. It ends by explaining how the thesis has been organised.

Chapter 2 is divided into three sections. In the first of these the theoretical background to the topic is explored, looking at a wide range of disciplines, all of which have a valuable contribution to make. The middle section consists of a review of historic environment legislation, from the first Ancient Monuments Act in 1882 to the present. Systems for designating and recording heritage assets are also considered. In the third part the relevant literature relating to both water supply in its wider context and to heritage legislation is reviewed. This takes a multi-disciplinary approach.

In **Chapter 3** geological origins of natural water sources are discussed, and the geology of Oxfordshire is outlined. The connection between these, place-names and the locations of early settlements is explored, using examples from Oxfordshire where possible. The remainder of the chapter provides a short history of the development of water supply from the prehistoric period to the present. This history focuses on technological developments and, while it uses examples from Oxfordshire, has a much wider geographical coverage.

The focus on Oxfordshire in **Chapter 4** is very sharp. Its administrative and political development and its landscape character are discussed and related to the differences between the parishes within it. After some more detailed explanation of some aspects of the methodology, there is statistical analysis and commentary on the catalogue of sites identified, which introduces some of the themes discussed in later chapters.

Chapter 5 looks in some detail at several aspects of water supplies and sources in rural areas, using mainly examples from Oxfordshire. Issues such as control of water supply in villages, provisions in farms and larger estates, parks and gardens and the evolution of holy wells into medicinal spas are considered.

The corresponding issues for the urban environment are explored in **Chapter 6**. In towns, the development of large waterworks and the diseases associated with contaminated water are examined. The chapter also looks at the role of philanthropy in access to clean water and discusses changes in bathing practice. Two towns, Oxford and Thame, are studied in particular detail. The final section of this chapter provides a short exploration of the use of water in industry and by other bulk users, such as institutions.

The topics discussed in **Chapter 7** are broader than those in earlier chapters. It uses a series of case studies to investigate current attitudes to the use and conservation of water sources which are not part of the main system. Some comparison is made with the position in other parts of the world, particularly Western Europe. Gender issues relating to water supply, the relationship between water supply and housing design over time and the role of water in memorial and ritual are all discussed.

The final chapter also falls into three sections. **Chapter 8** begins by assessing the particular contribution that archaeology can make to the study of water supply. The middle section considers the efficacy of existing legislation and recording systems and how this might be increased. Finally the conclusions arrived at from this research are laid out, together with suggestions for the direction of possible further work.

The text is fully referenced and illustrated with appropriate maps, photographs, pictures and figures. A GIS programme, MapInfo™, was used in the production of the maps.

In addition to this text, a Bibliography is provided. A summary Catalogue of all the sites identified in Oxfordshire is appended, together with lists of all sites from outside the county which have been used as examples. A copy of the site database, giving more detail about each than is provided in the Catalogue, is included on a CD. Where possible each site has an accompanying image.

2 THEORETICAL AND METHODOLOGICAL BACKGROUND

2.1 Theoretical and Methodological Context

2.1.1 Relevant Disciplines in the Study of Water Supply

It is not immediately apparent where the main academic interest for the study of the remains of early water supplies should lie: with archaeologists, local or social historians or architectural historians. This uncertainty arises at least in part from the variety of interpretations which each imposes on its own purposes and parameters of study and from the different ways in which one group of specialists views the role of the others. There is no consensus on these perspectives either within or between disciplines and the boundaries change over time as different theoretical approaches develop (Tabaczyński 1993, 2).

These various disciplines fall broadly into two groups: those whose work is rooted in the study of the physical survival of past societies and their material culture, and those for which the documentary record has primacy. Within historical archaeology the combination of the two types of evidence (Little 2007,14) has emerged as a particular strength and it does not fit easily into either group.

2.1.2 Material culture

Archaeology

For archaeologists, the debate over the role of archaeology has played an increasing role in recent decades in theoretical approaches (Edgeworth 2011, 131), most particularly for prehistoric archaeology, although the arguments have been given wider application, for example the understanding of space has extended into post-medieval house plans (Tilley 1993, 337-42).

At the opposite end of the chronological scale, the recent development of post-medieval and industrial archaeology has focused on what should be included within archaeology and what belongs to history. This debate has been of particular relevance in the United States of America where historical archaeology encompasses everything which post-dates European colonisation while the study of earlier periods is seen predominantly as a branch of anthropology (Deetz 1996, 5). In the USA archaeologists are found within university anthropology departments whereas in Britain the traditional links have been with history and classics departments.

Dictionary definitions of archaeology do not help, reflecting a narrow, out-dated vision. Adherence to the definition in the Oxford English Dictionary '*The scientific study of the remains and monuments of the prehistoric period'* (Oxford English Dictionary 2nd Ed.), would prevent this study from progressing at all, but for some historians archaeology is still seen as covering ancient sites and their remains (Tosh 2002, 55). Others recognise that the period studied by archaeologists has now extended to the recent past, while expressing doubts about the necessity and value of archaeological studies of material culture for post-medieval history (Burke 2001, 13). For some, the existence of historical archaeology can be seen as perverse, given the vast amount of material which survives from more recent periods (Hicks & Beaudry 2006, 1).

As the theoretical basis for archaeology has evolved since the 19th century, the attitude of archaeologists to material culture and its contribution to understanding of sites and periods has changed with it.

Until the 1960s archaeologists had been trying to use the available field evidence to provide a description of the past, which focused on identification through typology of

material remains of distinct 'cultures'. Culture in this context refers to recurring assemblages of artefact styles and practices which may relate to a particular human culture. Archaeologists' attention was more on differences between cultures rather than similarities or trends and theoretical discussions were almost exclusively concentrated on diffusion, either of people or ideas, as the basis for change. The identification of typologies was also of major importance as a tool for establishing chronologies and dating sites, before more scientific methods were widely available. For Childe for example, material things were not of relevance unless located within a determinate context (Childe 1956, 30).

The New Archaeology developed by people such as David Clarke and Lewis Binford in the 1960s adopted a more questioning approach, with archaeological data used to test various hypotheses of human behaviour in a scientific way. This period also saw the development of a whole battery of scientific tools for dating, geophysical survey and material analysis, which extended the range of questions to which archaeologists might expect answers (Clarke 1973, 9). Cultures were seen as evolving entities within which a range of different systems was operating. Trigger (1978, 228) is 'convinced that the study of societies and cultures as complex evolving systems should be a major goal of archaeology.' However, the objects themselves were still seen as sources of information rather than meaning. The archaeological record is the result of the action of mechanical processes on matter, but not social forces linked to a particular point in time (Thomas 2004, 211).

Processual archaeology, as the New Archaeology became known, has been criticised by many theoreticians as too functionalist and scientific, with insufficient allowance even in cultural areas for the influence of the human element. The positivist, scientific approach lends itself to generalisations and attempts to explain change. The functionalism of

processual archaeology has numerous parallels with Marxist theories and for many the terms processual and Marxist archaeology can be interchangeable. They both regard systems as evolving over time and are concerned with processes of change, with Marxists interested in the forces of production and their relationship to the class struggle (Renfrew & Bahn 2012, 479). Processual functionalism sees a move to greater efficiency of systems.

Neo-Marxist ideas, with an emphasis on social awareness, contributed to the development of post-processual archaeology, which some of its leading practitioners feel would be better termed 'interpretative archaeologies'. The work of Hodder, Shanks and Tilley among others has moved away from the objectivity of processual archaeology with its generalised theories to the acceptance that there is diversity across societies and cultures (Johnson 1999, 98-9).

Interpretative archaeologies give human actions and individual experiences, both in the past and the present, a central role in the development of society and its interpretation - the phenomenological approach. The underlying theoretical basis owes much to the ideas of sociologists and philosophers, in particular Pierre Bourdieu. His theory of practice and the concept of *habitus*, with a set of unconscious strategies allowing actions to be adapted to their context (Bourdieu 1977, 95), has influenced the development of approaches such as 'agency' (Robb 2001).

For post-processual archaeologists there is no one correct answer. The emphasis on the actions and thoughts of past individuals does, however, raise the question of how far it is possible to empathise with people from the past and the extent to which modern norms and assumptions influence interpretations. For example, while the provision of a village pump will have been seen in different terms by its provider and a local housewife, it is

also unlikely that a 21st century archaeologist would be able fully to appreciate its significance to either.

This consideration of the materiality of objects is more relevant to water-supply than the traditional 'artefact studies' approach. However, the features do demonstrate chronological variations in technology, decorative styles and construction fabric, and distribution patterns can be related to geology and to manufacturer.

Industrial archaeology

The origins of industrial archaeology lie with the post-war Workers' Education Association lecturers who taught students about the Industrial Revolution. The Council for British Archaeology established a research committee for the discipline in 1959 and the Association for Industrial Archaeology was founded in 1973 (Nevell 2006, 4). Despite this recognition, industrial archaeology remained very largely an amateur interest, with no dedicated courses for undergraduates within British universities until the end of the 1980s (Palmer 1990, 275).

Debate among industrial archaeologists was originally focused on whether they should pursue themes, such as the development of agriculture from the Neolithic onwards, or concentrate on the study of remains of the industrial period associated with the 18th century and later. The rapid decline of many of Britain's industries, including manufacturing and transport, led to the period approach becoming the accepted focus for the discipline. Water pumps and wells with their range of design variations and technological advances form an appropriate topic for study. Tremendous amounts of work were carried out in recording and preserving Britain's industrial heritage, with many working museums established, some based on Victorian pumping stations such as Kew, Papplewick and Big Dalton (Cossons 2000, 129).

However, many industrial archaeologists have become unhappy about the narrowness of this approach, questioning the purpose of the information recorded (Hudson 2001, 8). From the 1990s they have sought ways to integrate the discipline with broader historical and archaeological debates about the post-medieval and modern world. Currently industrial archaeology is moving towards methodologies – including new areas for field survey – which allow it to contribute to an understanding of the industrialisation of societies, where all aspects of life rather than just manufacturing processes are taken into account (Palmer & Neaverson 1998, 4). This trend brings industrial archaeologists in Britain more into line with historical archaeology in the United States and approaches in other countries such as France, where the idea of an Industrial Revolution as a period of economic transformation was adopted as early as the 1820s (Nevell 2006,6).

The relationship between industrialisation and urbanisation is reflected in the changes in water supply provision within towns and cities. These expanded to accommodate industrial plant and the work-force needed to operate them, increasing demand for water to homes and for the industrial processes themselves. Disease throve in the overcrowded conditions, often spread by polluted water.

Architectural history

Many surviving water features, ranging from large late Victorian pumping stations to village pumps, have been designated as Listed Buildings. This might suggest that they properly fall within the remit of architectural historians. Listing requires identification of features and – to a greater extent, the more recent its date – some element of selection for which criteria have been drawn up. The contribution of features to an understanding of society or their inclusion in larger area studies goes beyond these criteria, and in general outside the coverage of the architectural historians, whose interests are more focused.

There would appear to be less introspection and debate about the boundaries and function of research among architectural historians than within other disciplines. In 2003 the website of the Society of Historical architects, a primarily US organisation, hosted a debate on the relationship of history to preservation issues. The difference between history used to justify preservation and more conventional historical scholarship was addressed, but analysis of the arguments showed that in fact contributors had concentrated on issues of taste (Lipstadt 2003, 2-3). This concentration on the specifics of historic buildings and architecture, with little attempt to place them in a wider context, seems typical of the discipline.

In 1980 David Watkins noted that:

> *One of the more striking characteristics of recent architectural history has been the increasingly determined attempt to relate buildings to the society in which they were produced, and to the way of life for which it is believed that they and their contents were originally intended.*
>
> (Watkins 1980, 183)

Watkins went on to give examples, particularly concerning country houses, of relevant works and authors, especially those of Mark Girouard. There are some examples of urban studies and of specific structures, but the isolated monument and the vernacular generally are not well represented.

Journals published since then by the Society of Architectural Historians (SAH), Vernacular Architecture Group and Institute of Historic Buildings Conservation (IHBC) provide little material which considers the historical and social context of buildings and structures. Criteria by which the significance of a building may be justified have been

suggested by the SAH (SAH 1986), the IHBC and the Heritage Council of Victoria, Australia, all of which include consideration of its historic setting. IHBC identifies buildings' potential as educational tools in social and economic history (IHBC 2005, 29) while the Victoria guidelines prompt one 'to develop ideas about the ways in which people and communities have valued the place or object' (Miller 2004, 23). The journals contain little material which attempts to take these issues further.

The possible benefits of cross-disciplinary studies of historic buildings are acknowledged (Hughes 2001, 48, Currie 2004, 1), but the emphasis is very clearly on documentary research. Currie's statistical analysis of approaches employed in multi-disciplinary projects includes archaeology, dating techniques, landscape evidence and cartography although only dendrochronology appears to have an increased application. The wide range of possible sources is stressed, but their role is seen as contributing to the understanding of a particular structure rather than as helping to place it within a broader context.

English Heritage (including the former RCHME) has published a number of thematic studies, on hospitals and textile mills for example, but so far the archaeology of reservoirs and pumping stations, often buildings on a similar scale, has not been addressed.

2.1.3 Documentary records

The expression 'documentary record' needs some amplification. Written material including official records, primary sources, including letters and diaries, and subsequent synthetic studies provides the bulk of data. However, visual images from maps, art works and photographs also contribute and for more recent periods there is an increasing role for film, television and radio. Recorded oral histories should also be considered as documentary sources.

History

History, the study of the past, can be regarded from various perspectives. However, in all cases the emphasis is on the documentary record rather than on material culture. Traditionally the study of history was seen as the study of politics, operating on national and international levels, with emphasis on major events and the key figures involved. By the mid-19th century some historians, led by Leopold von Ranke, had come to see the past as the foundation for understanding the present. The Rankean historians established the subject as an independent field with its own specialists, who were interested in determining the truth about the past. Two of their tenets, both still very relevant, were that the past should not be judged by the standards of the present and that it is essential to return to primary sources to ensure reliability (Evans 2000, 17-18).

Rankean history has certain limitations, despite its relatively scientific approach. The concentration on a narrative of political events excludes ordinary people from the picture. There was also a tendency to produce narrow, simplistic explanations where perhaps no single correct explanation could be formulated. Although the tenets described above are noble in intent, the first, objectivity, is not possible and the second led to a focus on documents to the exclusion of a much wider range of available evidence, including archaeological material (Burke 2001, 3-6).

After a period in which traditional history became in part a nationalist tool, a move to a wider view of history was introduced by the *Annales* school of mainly French historians, established in the first half of the 20th century. Braudel for example argued in favour of studying long-term social and economic changes, a concentration on structures rather than events. For this to be effective a more extensive evidence base than archival records needs to be established, with attention given to the work of other disciplines such as

geography and sociology (Tosh 2002, 121). It was as a result of this *new history* that the study of everyday life, such as the use of water, became a valid and, for some, the only 'real' history (Burke 2001, 10). Although material culture, mainly the concern of archaeologists, was seen to be important, most historians still only approached its study through literary sources. As in archaeology, scientific method and statistics were increasingly utilised.

The move towards cultural history has been affected in a similar way to archaeology with Marxist and neo-Marxist philosophies, marked by a growing distrust of the functional methodology. These theories were really developed within social studies. History has seen a parallel change to a post-structuralist or post-modern approach, where our inability to determine the truth of the past and the validity of different interpretations is acknowledged and exploited (Burke 1992, 126). Sociological theorists such as Lévi-Strauss have influenced historical thinking, for example in studies of the motivations and symbolism attached to gifts (Wolfinbarger 1990, 699).

The place of narrative in historical writing is being re-established, although without the emphasis on great events or important individuals. The concept of history from below has been firmly established, although the absence of many groups from the documentary record does present problems.

Social and economic history

Economic and, later, social history developed as separate disciplines as a result of the growth of the changing approaches of the new history. Initially economic history was concerned with the economics of the state, but work on that level proved inadequate in dealing with some of their major concerns, such as industrialisation, and its remit has widened to include more localised or specialised studies. However, it does retain a more

impersonal approach than most strands of history currently adopt (Tosh 2002, 123-5).

Social history started considering social problems, such as poverty, the history of everyday life and the common people, who did not feature in political and economic history. From the poor relation, 'history of a people with the politics left out' according to Trevelyan (Trevelyan 1942, vii), social history has become a major strand of history, looking at social structures and exploring the constantly changing relationships between different groups within society (Tosh 2002, 126). Water supplies are relevant to all these facets of social history.

Local history

Local history is a form of social history, focusing on a narrow geographical area. It suffers from lack of interaction with other disciplines, in part because of the important role which the amateur plays and because there has so far been a concentration of effort on the recent past (Tiller 2006, 157). A close study of a particular village, parish or local area lends itself to investigation by those who live within that environment and who have access to data not incorporated into the official records. The development of local studies has traditionally been driven by the adult education movement, from the Workers Education Association (WEA) to the extra-mural departments of universities (Marshall 1997, 18).

Living history projects in which the collection of personal reminiscences and photographs feature strongly have become important in recent years. This trend is supported by the increased emphasis on outreach activities to link schools, their communities and the past. Political initiatives to strengthen community identities and social inclusivity though cultural heritage also draw on living history (Tiller 2006,150-5). Some excellent work has emerged from these projects, although little consideration of

water supply has been identified. One exception was the millennium project carried out by the Blewbury Local History Society (Author visit 2000). Such initiatives will be considered in Chapter 7.

Another major theme within local history is family history, mainly individuals researching their own families, but in some instances providing a systematic study of the population within a specific area (Tiller 2006, 155-6). This research is almost exclusively pursued through parish registers and census returns held in the relevant Record Office and increasingly online.

Theoretically, local historians have available to them a wide range of sources, including the existing landscape and buildings. There is some overlap between local historians and archaeologists, but this often depends on the approaches developed by those providing classes in the respective disciplines, many of which encourage overlap and exchange of ideas, up to the level of joint post-graduate seminars. In the main, however, local historians confine themselves to documentary sources, where water supply makes a limited appearance.

An issue for local history is the nature of the output, which too often consists of a narrative which does not attempt to pose questions about the society recorded. Titles such as 'Witney in Old Photographs' compile selective snapshots, but make no attempt to analyse the community and its relationships (Rogers 1977, 5-7). A picture of a well or pump on its own adds little to an understanding of the life of its users. Similarly the results developed for a small area such as a village are not always compared to those from other localities or the ideas addressed over a larger area (Marshall 1997, 80).

2.1.4 Historical and post-medieval archaeology

The separation of history and archaeology is limited for historical and post-medieval archaeologists. Historical archaeology began to emerge in the 1930s when the need to balance documentary sources with studies of artefacts was realised and, as already mentioned, it is particularly strong in the USA. Artefact studies are seen as providing a route to the understanding of everyday lives seldom found in the written record, in particular for the lower status social groups, such as African-Americans (SHA 2006). The contribution of historical archaeology can be summarised as follows:

> *'In all cases, historical archaeologists bring an awareness of how much of daily life remains undocumented, unspoken, and yet is far from insignificant and often leaves material traces.'*
>
> (Hicks & Beaudry 2006, 2-3)

Deetz (1996, 257) regards the material culture obtained from archaeological investigation as a far more objective picture of the past than interpretations of documents or museum displays, which are more susceptible modern cultural assumptions. Archaeology shows the detail of everyday objects such as water supplies and their relationships which does not appear in the written record. When material culture is studied, conflicts with the picture derived from documentation often arise, showing that societies were more diverse and complex than much historical writing has suggested (Hicks 2004, 938).

In the UK, studies of material culture have traditionally been categorised on the basis of material, e.g. iron or pottery, but in the USA historical archaeologists have used functional categories e.g. personal or military (Cochran & Beaudry 2006, 191). Such standardised classifications are useful for comparing sites and provide a sound basis for

exploring the materiality. Historical archaeologists consider texts as artefacts, using them to identify the people who occupied a site, to understand the socio-cultural context of the occupation, and to understand the social-meanings and lives of objects recovered (Wilkie 2006, 16). This can be expressed as 'using material culture to comprehend aspects of everyday social life that often go unmentioned, or are obscured for varying ideological reasons' (Cochran & Beaudry 2006, 193).

Historical archaeology has seen some theoretical development. Deetz introduced a structuralist approach, making assumptions about universal structures operating in binary pairs of opposites, such as Nature-Culture or Public-Private. The Male-Female opposition was not readily acknowledged and has received more attention from post-structuralists, who added a historic cause and effect dimension (Little 2007, 98).

The scope of the documentary record allows historical archaeologists to operate within precise chronologies, which can enable detailed micro-histories to be developed. These need to be placed in a broader context and for many this has followed the *Annales* model of total histories. However, various alternative approaches exist. Genealogies explore a network of connections with a temporal basis, tracing different paths through it. A biographical approach combines a detailed history of a particular group with changes in cultural meaning of sites and objects over time. Another approach, which leads away from a focus on a particular site, involves the development of a 'commodity chain' (Lucas 2006, 38-42)

Historical archaeology has evolved its role, from being seen as an adjunct to either anthropology or history, through to using a more sophisticated combination of archaeological remains and documents to produce a unique approach to the development of society (Deagan 1988, 10). More recently historical archaeology has begun to consider

a more post-modern approach, acknowledging that there are many ways in which the evidence can be interpreted. Different explanations of sites can have validity, provided they are based on sound archaeological understanding (Praetzellis 1998, 3).

In Britain the interest of archaeologists in the less distant past, with post-medieval usually taken to begin in the mid-16th century, has developed even more recently. The Society for Post-Medieval Archaeology was founded in 1966 emerging from a group which had concentrated purely on ceramics. The acceptable cut-off point for archaeology is still a matter of debate, but recognition of the rapid pace of recent development and the current level of interest in the military archaeology of the 20th century, including the Cold War, has brought it very close to the present for many.

As for the historical archaeologists of the USA, post-medieval archaeology can bring a different perspective to the wider historical picture derived from documents by historians, particularly for ordinary people and their everyday existence (Crossley 1994, 2). Archaeologists explore material in the contexts where it was used, even things which could be regarded as trivial. In addition, close contact with these historic artefacts provides an additional level of experience to engage the imagination of the wider public (Tarlow 1999, 264). However, the high level of survival of remains from more recent periods means that many are absorbed into contemporary living and provided with new meanings, not always in accord with past realities (West 1999, 2-3). The plethora of pump troughs used as flower beds in picturesque villages provides one such example. This over-familiarity with the remains of the recent past can inhibit understanding of past societies and this evolution of social meanings must be acknowledged. Generally post-medieval archaeology has resisted the influence of post-processual theorists, much of its output remaining a focus on objects or on buildings (Newman 2001, 3).

One particularly rich area for post-medieval archaeological study, and for historical geographers, is landscape archaeology, where the focus is on settlements and distributions of features over wide areas, rather than on individual features. Landscape archaeology as a discipline began with W G Hoskins in the 1950s, evolving from a descriptive exercise to the analysis of change seen in the work of T Williamson and his co-workers (Newman 2001 100-101). The term landscape is here employed for both rural and urban areas. Britain's modern landscape is predominantly the result of actions arising during the post-medieval period. Enclosure movements, changes in agricultural practices, the growth of designed landscapes, urbanization and industrialisation have all played their part.

2.1.5 General issues

Whatever the discipline, there are two major issues capable of reducing the value which studies of a particular element of the past, such as water supply, can contribute to the wider understanding of past societies: antiquarianism and fragmentation.

Antiquarianism is seen by many historians as akin to stamp-collection, where the cataloguing of large quantities of data is seen as an end in itself. Both archaeologists and local historians have been accused of such practices, regarded by some historians as having low intellectual value (Marshall 1997, 47). While it is true that some practitioners, often but not always amateurs, do spend their time on increasing the data base without any real attempt to analyse data, raise questions or attempt to answer them, the value of a large, reliable fund of basic information to the consideration of wider issues should not be underestimated. Patterns are likely to emerge from large amounts of data which can lead to the development of the research agenda, suggesting new lines of investigation. It is also true that more data, particularly covering a larger area, can throw doubt on conclusions and theories which thus benefit from reconsideration. The information

generated by antiquarians has, however, no benefit unless it is both available to and accessed by others.

The 20th century saw the establishment of a wide range of sub-disciplines within archaeology and particularly history, some of which have been discussed above. These have further fragmented into specialisms, such as Women's and now Gender Studies or Black History, which often engender mutual suspicion and misunderstanding (Burke 2001). Water supply should make a significant contribution to Women's Studies, as the everyday lives of women were directly impacted by changes in availability of water. All practitioners can use the data, carry out analysis and reach conclusions which are not necessarily shared. In order to generate a full picture of past societies it is important that these different approaches be brought together for debate (*ibid*, 17).

One way in which this might be accomplished is through a microhistory of a restricted section of the population, where a very detailed picture or 'thick description' of a situation or series of events is created. The placing of apparently isolated events within a social context will facilitate a level of analysis which can identify patterns of possible cause and effect which are not otherwise apparent (Burke 2001, 139).

Once these possible explanations and general trends have been developed, they can be tested against evidence obtained from other communities which may give rise to theory with a wider application. The other comparative examples could be in close proximity, parishes within the same county for example, or provide a distinct contrast based on geographic location or economic status. An alternative approach would be to begin with the hypothesis of a general theory and then seek case studies to illustrate it.

Whichever discipline or approach is taken, the opportunities to raise awareness of water

supplies are many.

There is no single discipline to which the study of water supply can be exclusively assigned. It is by no means unique in this; the technology of the textile industry has been a major area of interest for industrial archaeologists, while the impact of large factories on urbanisation and society interests socialists and historians for example. Archaeology, history and architectural history all have a contribution to make and the importance of water supplies will only be fully realised when these are brought together. Only where an integrated use of all available sources is made can the evidence be used to provide a full picture of the role that water played in the lives of individuals, local communities and society in the wider context. Historical archaeology comes closest to this broad-based approach.

2.1.6 What can a study of water supply contribute?

The mechanisms by which water is made available can reveal a great deal about a particular society and its organisation. Water is one of the key components of everyday life and is essential to all, whatever their social position. However, across time and social hierarchies there is wide variation in access, ranging from natural supplies to the facilities provided by modern, multinational water corporations.

The major area in which the archaeology of water supplies can contribute to the understanding of society is through the study of control of this access. Among the questions which can be posed and, to some extent, answered are:

- who has access to a particular supply?
- who controls the provision of supply?
- why and how?
- what are the benefits for the patron (e.g. power, pure philanthropy, self-interest)?

- what different types of power operate – landowner, community, state, local authority, commercial interests?

The study of water supplies can make a contribution in other areas also, including technology, health, environmental issues, religion and ritual, leisure and aesthetics.

All these elements are explored in more detail within this study. The theoretical approaches demonstrated contain elements from many of those described above, showing that there is not one particular form of archaeology which is intrinsically better than the others, but that all have their merits in particular cases. The examples also illustrate the value of combining types of evidence and working in an interdisciplinary context.

2.2 Legislation and Protection

If extant water supply features are to contribute to and form a basis for study their existence must first be recorded and appropriate measures then put in place to ensure their preservation. While the role of local knowledge and of individuals or groups taking 'ownership' of a site is vital, more formal mechanisms also exist.

2.2.1 Legislation

The 19th century

The issue of conservation came to prominence during the 1840s at a time when many antiquarian societies were founded, including the Archaeological Institute in 1842 and the British Archaeological Association, which separated from it in 1844. The parent organisation included in its manifesto the desire to protect surviving ancient works from demolition or decay (Hunter 1996, 39). The earliest pieces of protective legislation were related to works of art, churches and open spaces (ibid, 7, 24, 191).

One individual who fought to preserve prehistoric sites such as earthworks, tombs and stone circles was Sir John Lubbock, later Lord Avebury, who introduced no fewer than seven unsuccessful bills between 1873 and 1879 (Alexander-Fitzgerald 2000). The drive for legislation was in part a response to observations of the destruction of sites. In 1870 Pitt Rivers was horrified by the actions of an Oxfordshire landowner who began to dig away the earthen ramparts of the Iron Age site, Dyke Hills, at Dorchester-on-Thames (Pitt-Rivers 1870, 415), where in fact ploughing is still damaging the monument (Guardian 26/07/2003) .

When the Ancient Monuments Protection Act was finally passed in 1882, its aim was to facilitate the move into state guardianship, with the owner's consent, of a limited range of prehistoric site types, (Hunter 1996, 38). There were 68 sites on the original 'schedule', including Dyke Hills, Stonehenge and Avebury. General Pitt-Rivers was appointed first Inspector of Ancient Monuments with the task of arranging the transfer of control, but by his death in 1900 only forty-six monuments were under guardianship (ibid, 41). It became an offence to damage the monuments on the schedule, except for owners who had not transferred their control. The act only applied to those 68 sites and those 'of like character' which could be added to the schedule but offered no protection to any features connected with water supply. The restriction of the act to prehistoric monuments was acknowledged to be largely to reduce the cost of guardianship to public funds.

20th century

In 1900 passage of the Ancient Monuments Protection Act extended the guardianship scheme to any ancient or medieval structure, erection or monument which was a matter of public interest by reason of its historic, artistic or traditional interest (Hunter 1996, 41). Dwelling places, other than those for caretakers, could not be added to the schedule, but

some water supply structures could now be protected, if judged important.

The RCHME was charged in its 1908 Royal Warrant with making recommendations for preservation, although these had no practical force (Sargent 2001, 59). A further expansion to the scope of protective legislation occurred with the Ancient Monuments Consolidation Act 1913. This introduced the provision of expert advice on what constituted a site of national importance and for the first time there were active moves to prevent damage to sites, through the requirement to give notice of proposed work and to obtain approval for it (Hunter 1996, 42-3). It also finally introduced powers enforceable against the owner of a monument (Thompson 1963, 224). Under this act Ancient Monuments Boards and Historic Buildings Committees were established to advise the relevant government officers.

After World War I, increased construction of transport systems, housing and associated infrastructure made a significant impact on the countryside. Concern about detrimental effects led to formation of the Council for Preservation of Rural England in 1926 (Hunter 1996, 47) and the 1931 Ancient Monuments Act included the idea of 'controlled areas' in which a 'preservation scheme' would operate. New buildings and alterations which would affect the character of existing structures were subject to restriction. The Act also simplified the procedure for preservation orders introduced in 1913 (ibid, 50).

Guardianship has never become the preferred option for protecting monuments and of the five Scheduled Monuments in Oxfordshire it applies only to North Hinksey Conduit House (VW020).

Historic buildings had received limited statutory protection, but inhabited buildings none until a series of Town and Country Planning Acts began in 1932 (Hunter 1996, 117-8).

This encouraged local authorities to designate planning schemes for specific areas, inviting them to 'schedule' houses and other buildings which could not then be demolished without permission. The 1932 provisions were not utilised on any large scale, but provided the foundation for the 1944 and 1947 Acts under which the national scheme for listing buildings was established (Hunter 1996, 120).

Buildings of historical or architectural interest could be designed as Grade I, where 'their destruction should in no case be allowed', or Grade II, where 'preservation should be regarded as a matter of national importance'. A supplementary list of lesser properties, usually those included mainly for their group value, was shared with the local authority, but not the owners of the buildings. Criteria for inclusion were not clear, although anything older than 1725 with a reasonable level of survival and most pre-dating 1800 could be included, but very few recent buildings were Listed.

In 1953 the Historic Buildings and Ancient Monuments Act provided for state grants towards repairs and maintenance of outstanding buildings. It also revised the system for preservation and guardianship orders, and made owners liable to prosecution for damage to scheduled sites (Hunter 1996, 51). Further grants were introduced in the Local Authorities (Historic Buildings) Act 1962.

The Civic Amenities Act 1967 introduced the concept of Conservation Areas (Hunter 1996, 139) as a means of preserving the character of a town, and the subsequent Town and Country Amenities Act 1974 introduced the requirement for demolition consent within a Conservation Area, and thus some protection was given to undesignated structures (ibid, 135). The current legal position is given in the Planning (Listed Buildings and Conservation Areas) Act 1990 (Hunter & Ralston 1993, 77). Planning permission is required for all development work unless statutorily exempt and local

authorities must draw up development plans against which planning decisions are weighed. The Act also defines what buildings can be listed, including any structure or erection, which covers pumps etc. Unfortunately, plant or machinery contained in a building is excluded, so listing does not necessarily preserve features in working order (Suddards & Hargreaves 1996 p20).

The lists of buildings deemed to be of historical or architectural interest drawn up in the immediate post-war period was augmented on an irregular basis as new structures were identified and in response to development threats. A few sites in Oxfordshire such as the Cold Bath at Rousham (WO056) and the Portwell, Faringdon (VW023) were Listed in the 1950s as were some of the more elaborate fountains and wells, including Henley's Phillimore fountain (SO014) and the Maharajah's Well, Stoke Row (SO010). However in the 1980s a major re-survey of the whole country was carried out under Michael Heseltine, with rural areas given proper consideration for the first time (Doggett 2007). The majority of the Oxfordshire water features which are Listed, particularly roadside pumps such as the examples at North Newington (CH050) and Baulking (VW052) ,were added to the lists as a result of this work.

During the post-war period, redevelopment work on a large scale was taking place throughout the country, particularly in urban areas, peaking in the late 1960s and early 1970s leading to further changes to heritage legislation. Important legislation was passed in 1979: the Ancient Monuments and Archaeological Areas Act (AMAAA), which is still the main legal protection for monuments, through scheduling (Hunter 1996, 53-4). The Act, still excluding dwelling and ecclesiastical sites, redefined a monument as:

> *(a) any building, structure or work, whether above or below the surface of the land, and any cave or excavation;*

(b) any site comprising the remains of any such building, structure or work or of any cave or excavation; and

(c) any site comprising, or comprising the remains of any vehicle, vessel, aircraft or other movable structure or part thereof which neither constitutes nor forms part of any work which is a monument within paragraph (a) above;

and any machinery attached to a monument shall be regarded as part of the monument if it could (sic) not be detached without being dismantled.

The 1979 Act introduced the present system of Scheduled Monument Consent (SMC). It also tried to address the problem of the character of urban areas through the designation of an Area of Archaeological Importance (AAI), in which developers were required to give notice of proposed work and provide access to archaeologists. Only five towns were so designated before the scheme was dropped. Scheduling, while offering good protection, is now limited to monuments of national importance.

Some amendments to the AMAAA have been made; in 1994 the Archaeological Monuments (Class Consents) Order was passed (Pugh-Smith & Samuels 1996, 28) and the 1983 National Heritage Act established the Historic Buildings and Monuments Commission (HBMC), which adopted the popular name English Heritage (EH), which took over many of the responsibilities for scheduling from the Secretary State. The latter Act also replaced the Ancient Monuments Board and Historic Buildings Council. Among other minor legislative changes were the 1980 National Heritage Memorial Act, appointing Trustees who could authorise financial assistance for the acquisition, preservation or maintenance of land, buildings or structures of national importance, and Circular 8/87, allowing any building over thirty years old to be listed (Hunter 1996, 193). Circular 8/87 sets out the criteria under which a building should be assessed for listing.

These criteria, which are not statutory, had been drawn up to assist those responsible for scheduling when the number of cases to be considered began to exceed what could be dealt with through individual consideration by the experts of the Ancient Monuments Board. The number of Scheduled Monuments increased slowly during the 20th century, while the number of known sites rose steeply. English Heritage established the Monuments Protection Programme (MPP) in 1986 because it felt that the sites with statutory protection were a small, unrepresentative sample of surviving monuments of national importance (EH 1997, 6).

MPP has three main aims (Darvill *et al.* 1987, 393):

- to review and evaluate existing information about sites of archaeological and historical interest in order to identify those of national importance
- to produce recommendations for statutory protection of those identified
- to collate information about their condition in order to plan future preservation strategies.

The evaluation process has three stages, each of which involves assessment of several criteria shown in Table 2.1.

Characterisation Criteria	**Discrimination Criteria**	**Assessment Criteria**
Period (currency)	Survival	Condition
Rarity	Group value (association)	Fragility
Diversity	Potential	Vulnerability
Period (representativity)	Documentation	Conservation value
	Group value (clustering)	

	Diversity (features)	
	Amenity value	

Table 2.1: MPP Evaluation Criteria

The first stage, characterisation, is designed to produce a Monument Class Description for all single monument types or for period-specific relict landscapes and urban areas. The classification from the Class Description for 'Holy Wells (Bond 1990)', which describes the various types, is given in Chapter 5.

The second stage identifies sites of national importance. Of the seven criteria, six are scored on a three point scale and the seventh, group value (clustering) on a two point scale. Documentation is sometimes split into 'archaeological' and 'historical'. The totals are compared with a threshold score to assess whether the site merits scheduling (Hunter & Ralston 1993, 190). Not all criteria are considered relevant to a particular class of monument and the Class Description sets out which should apply. The final assessment stage criteria, used to suggest management strategies, are more subjective as each site has its individual circumstances.

It was realised that existing SMR data for some classes of monument were inadequate and national evaluations schemes were developed and tested initially for industrial archaeology. There are six steps:

- step 1 classification and characterisation
- step 2 data collection
- step 3 assessment
- step 4 evaluation
- steps 5 and 6 implementation

One of the areas covered is 'The Water and Sewage Industry', for which the Step 1 Report (Douet 1995) outlines the main stages of development with definitions of key terms, analogous to the Monument Class Description. It includes a comprehensive bibliography and list of information sources, including the author's publication *Temples of Steam* (Douet 1992).

This Report covers a very broad field in a short document and, in consequence, concentrates on the major water treatment and distribution processes. There is no detailed consideration given to the variety of pumps and wells or to the effects of geology on water supply.

Step 2 was carried out on a county by county basis, providing a list which was then reviewed and selected features were assessed as part of Step 3 (Trueman 2000a), with management issues and recommendations for the future set out in Step 4 (Chitty 2002). The Step 1 report was published in 1995 and Steps 3 and 4 completed by 2001. Separate reviews of pumping stations and water towers (Trueman 2000b) were carried out in parallel with the Step Reports, based on the English Heritage Waterworks thematic database.

This work produced no change in the position of Oxfordshire's water features as the only recommendation, for the Listing of Oxford Waterworks (OX019), has not been adopted.

Even after AMAAA came into effect archaeology was not necessarily given consideration in planning. After publicity surrounding some high profile cases, London's Rose Theatre probably being the best known example, major changes in Government thinking occurred (Hunter & Ralston 1997, 146). Some important Planning Guidance notes were issued and cultural heritage now forms a routine section of Local Plans and

planning applications.

Planning Policy Guidance Note 16, Archaeology and Planning, (PPG 16), issued in 1990, deals with the need for archaeology to form part of a development plan, and the liability of the developer to fund archaeological work and states that preservation *in situ* should be the preferred option.

"Where nationally important archaeological remains, whether scheduled or not, and their settings, are affected by proposed development there should be a presumption in favour of their physical preservation." (PPG 16 1990 paragraph 8)

PPG 16 also lists the criteria by which monuments should be considered for scheduling. The parallel Planning Policy Guidance Note 15 Planning and the Historic Environment (PPG 15) 1994 is broader in scope and avoids the emphasis on national importance. It talks about 'areas of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance' (PPG 15 1994, 15). The importance of water features in the historic environment is clearly acknowledged in Paragraph 5.15 on p24.

'Even the smallest towns contain a wealth of street furniture of historic or architectural interest, such as pillar boxes, telephone kiosks, drinking fountains, railings, clocks and many others, often of local distinctiveness. The appearance of historic streets can be improved by preserving or reinstating such items where appropriate.'

Unfortunately these PPGs were only guidance notes and not legislation, but compliance with them can have a major influence at a planning appeal or Public Inquiry.

2.2.2 Assessing protection

The efficacy of the protection regimes has been tested through a number of initiatives led by English Heritage.

Monuments at Risk Survey (MARS)

Within MPP there is little scope in terms of time or financial resources for consideration of additional sites, and the whole programme is geared towards monuments of national importance. Alongside it the Monuments at Risk Survey (MARS), which looked at the full range of archaeology, was carried out in 1995, with two principal aims:

1. A systematic quantification of England's archaeological resource;
2. An investigation into the implications of monument decay for different classes of monument in terms of the information preserved at different scales of survival.

There was an additional aim to ensure that the results of the project were disseminated (Darvill & Fulton 1998, 4).

MARS could not cover every monument within the available resources, thus samples for fieldwork were established. The selection of features to be considered was based on the existing NMR and SMR records. From their results the MARS team estimated that there were 300 000 recorded monuments in England, of which 16% had been totally destroyed since 1945. Only 6% were scheduled, but these did have a better survival rate. No information on the efficacy of Listed Building Status was recorded. Water features barely figured in the survey.

At Risk Registers

The condition of some Listed Buildings and structural Scheduled Monuments has been subject to regular inspection since 1998. An earlier survey in 1991 was confined to

London and looked at all grades of Listed Building, although the organisation SAVE, a campaigning group (http://www.savebritainsheritage.org/), has been producing its own register, including some non-listed buildings since 1989. The EH 'At Risk' Registers only include Grade I and II* buildings, which are eligible for some grant aid for repairs.

In 2008 the scheme was expanded and the 'Heritage At Risk' Register now includes Registered Battlefields, Registered Parks and Gardens, Shipwrecks and Conservation Areas as well.

In 2012 a total of 5831 monuments appeared on the register (EH 2012), one of which, the Well House at Wick Farm (SO042), was an Oxfordshire water feature. Unfortunately it is not possible to carry out a search by class of building to identify the number of 'At risk' water features nationally.

2.2.3 Heritage Protection Review

By the beginning of the 21st century the importance of the historic environment and its broader potential contribution to tourism, regeneration and a sense of place was apparent to the government and heritage bodies. However, following reviews such as *Power of Place: the future of the historic environment* (EH December 2000) and *The Historic Environment: A Force for Our Future* (DCMS/DTLR December 2001), it was also clear that policy needed reviewing and that the system for the protection of historic monuments and buildings was seen to be excessively complicated and flawed. The Heritage Protection Review (HPR) process was launched in November 2002 and the first report issued in July 2003. *Protecting our historic environment: making the system work better* (DCMS 2003) made a series of recommendations including amalgamation of the different systems of designation into a single list, scope for discretion on what should be

added to the List, introduction of management agreements and better descriptions of why items were included. Following publication of *Review of Heritage Protection: the Way Forward* (DCMS 2004) English Heritage developed revised criteria for listing buildings, intended in part to aid compilation of the unified list of heritage assets. These changes were to have two parts: amended general principles and a set of selection guides for particular building types (ODPM 2004).

The main criteria for inclusion, which were formally adopted in a Planning Circular 01/07 in March 2007, are:

- architectural interest;
- historic interest;
- close historical associations;
- group value.

Increasing selectivity as the age of buildings decreases remains a principle and no building under ten years old is listed. Aesthetic merit, national and local interest and state of repair all remain of importance in the selection process.

The individual selection guides were based on over-arching guidance, *Principles of Selection* (DCMS 2010). Within the 20 types of buildings covered by the selection guides, which are non-statutory supplementary guidance, three give specific consideration to water features: Utilities and Communication, Street Furniture and Gardens and Parks (English Heritage 2011-2).

English Heritage has recently produced a similar set of selection guidance documents for scheduling, covering classes of monument. The most important of these for water supply is Utilities, which recommends that underground complexes of tunnels, pipes etc. or long

overground features such as leats should be protected by record rather than designation unless exceptionally early or technically innovative. Listing is considered more suitable than scheduling for buildings and structures relating to utility systems, although some medieval or Roman features may merit the latter (English Heritage 2012, 8).

The HPR continued and the White Paper *Heritage Protection for the 21st Century* was published in 2007 and a *Draft Heritage Protection Bill* in April 2008. When the Bill was dropped, EH reviewed the proposals, found that more than two-thirds of the proposals could be implemented without primary legislation and continued their programme of initiatives to achieve this. A single register and statutory HERs are among those aspects that are not possible at present, but EH hopes to support the development of Local Lists.

The planning system was undergoing a review aimed to at making it simpler and quicker, following a government Green Paper in December 2001. All the PPGs were to be replaced by a new set of Planning Policy Statements (PPSs). In line with the recommendations in the Planning White Paper *Planning for a Sustainable Future* (DCLG 2007), the more policy orientated *PP15: Planning for the Historic Environment* (DCLG 2010) was issued. This stresses the importance of HERs to the evidence base. It was to be supplemented by guidance formulated by EH, who published a draft *PPS Planning for the Historic Environment Planning Practice Guide* in July 2009. Neither document includes the criteria for designation that appeared in the PPGs and water supply received no specific references. PPS15 was only in force for a year, since in 2011 the National Planning Policy Framework (NPPF) became law: a single, shorter document which replaced all PPSs (DCLG 2011a).

The Government has also been eager to decentralise decision–making on planning issues, providing more opportunities to local government and communities, through the

Localism Act 2011 (DCLG 2011b). Although not all have done so, it has been possible for many years for local authorities to compile local lists of buildings which they consider of importance to their area, but would not be considered worthy of listing. Some, like South Gloucestershire Council (SGC 2008), have adopted these as Supplementary Planning Documents. The NPPF encourages the practice and increases the range of heritage assets which should be included on such lists, for which local people can make suggestions. English Heritage has published guidelines to assist this (EH 2012) and in Oxfordshire the different districts are either drawing up criteria or inviting nominations from residents for inclusion, which might include water features.

2.2.4 Recording

Antiquarian work

The recording of antiquities in a systematic manner has its origins in the 16th century when John Leland was commissioned by the Crown to carry out a search for surviving antiquities and monuments, by documentary research as well as field work (Darvill & Fulton 1998, 57). Unfortunately his *Itineraries*, like John Aubrey's *Monumenta Britannica,* were not published until the 20th century. Aubrey's 17th century work included medieval architecture, a field not looked at again until the 19th century (Greene 1983, 26). Leland only recorded three monuments relating to water: conduits at Richmond, Southampton and Dartmouth. Aubrey also recorded a small number of features: the hot wells of Bath and Bristol and three mineral springs at Twyford (Hants), The Peak District and All Cannings (Wiltshire).

Some early catalogues were published including John Norden's *Survey of Cornwall* in 1585, complete with maps, and Camden's *Britannica* the same year. Although less comprehensive in their coverage, there were other writers, most notably Stukeley whose works on Stonehenge and Avebury remain important resources. Wiltshire was

particularly well served by the early workers. When Colt Hoare published *The history of ancient Wiltshire* in two volumes in 1810 he introduced a barrow classification system (Darvill & Fulton 1998, 57).

Stukeley was arguably the first conservationist. In 1740 he was concerned about the effects of cultivation on the survival of monuments. The issue was also pursued in 1788 by Richard Gough who suggested that the *Society of Antiquaries,* founded in 1707, might play an active role in the preservation of historic buildings (Hunter 1996, 4).

Oxfordshire benefitted in the 17th century from the attentions of two antiquarians, Anthony Wood and Robert Plot. Wood produced a detailed survey of the City of Oxford while Plot, Keeper of the Ashmolean Museum, explored the whole of the counties of Oxfordshire and Staffordshire. Both authors recorded water features extensively.

Records in the 20th century

For a site to be entered into a schedule or to be considered during planning, its existence must first be registered. The end of the 19th and beginning of the 20th centuries saw the establishment of much systematic recording. In 1894 the Society of Antiquaries of London proposed a county-based survey of Britain and a year later a photographic survey was considered. Their Earthworks Committee was set up in 1900 (Hunter 1996, 42) and in the same year the Survey of London published Volume 1 of its Register of historic sites (ibid, 63). Three Royal Commissions on Historical Monuments, one each for England, Scotland and Wales, were set up in 1908 (Sargent 2001, 57) to produce complete inventories of monuments predating 1700 (ibid, 42). The number of volumes produced was small, but there was coverage of Buckinghamshire and in 1939 the City of Oxford, which contained three references to water features: Oxford Castle well (OX011), St Edmund Hall well (OX049), St Margaret's well, Binsey (OX007).

Archaeological recording also made great advances at this period through the Ordnance Survey (OS) under the leadership of O G S Crawford, appointed Archaeology Officer in 1920. Detailed mapping of the whole country was under way, with a team of local correspondents supplying information. Crawford was also a pioneer of aerial photography as a recording tool (Hunter 1996, 47-8). During World War II a tremendous number of buildings were destroyed or extensively damaged and, in response, the National Buildings Record was set up in 1941 to photograph and record historic buildings thought to be at risk (ibid, 123). The record was transferred to the Royal Commission on Historic Monuments (England) (RCHME) in 1963 and the scope extended to cover archaeology, creating the National Monuments Record (NMR).

Although there is no legal obligation for a local authority to keep a detailed archaeological and historic record, all of England is covered by a Historic Environment Record (HER) usually maintained at county level although with local authority reorganisation the picture is more complex and many of the National parks also maintain an HER. The HERs were originally called Sites and Monuments Records (SMRs). The first SMR was set up in Oxfordshire in 1965, but by the mid-1980s national coverage had been achieved (Baker & Baker 1999 p8).

The bulk of the SMR records were established using copies of the systematic indexing system developed by the Ordnance Survey Archaeology Division from 1951. Following the 1983 transfer of the division to RCHME, index cards also provided a basis for the archaeological portion of the NMR, to which the National Library of Aerial Photographs was added in 1984. The NMR now occupies converted Great Western Railway (GWR) buildings and purpose-built archive stores in Swindon and is part of English Heritage (EH) following its 1999 merger with RCHME (RCHME 1999 p 6-9). In 2012 it became the English Heritage Archive (EHA).

In 1992 English Heritage commissioned a series of detailed studies of 35 major historic towns and cities, the first stage of which involved establishment of an Urban Archaeological Database (UAD). These UADs are similar to the HER databases and operate in parallel. The Oxford City UAD was completed in 2002.

The EHA and HERs are constantly adding records, from new discoveries and also from study of archive material and documentary sources. Cut-off dates for exclusion are now set post-WWII and the range of monument types included is widening, reflecting concerns about industrial sites, coastal and landscape features and, for HERs, buildings. Electronic records – including Geographic Information Systems (GIS) to provide a spatial dimension – play an increasingly important role, bringing easier interrogation and sharing of information between organisations. This expansion in the coverage of HERs is being accompanied by an increasing focus on ways to widen access to the records, often through the internet. Many HERs have produced thematic studies, such as the Yorkshire Dales National Parks study of stone troughs (EH 2010, 14). The Norfolk Heritage Explorer website features a series of thematic, illustrated essays, one of which is *Water Towers in Norfolk (*Aldridge 2005).

EH also carries out thematic studies e.g. on hospitals and prisons, although those published to date have not included the water and sewage industries.

Maintenance of an HER is not a statutory requirement for local authorities which can make it a victim of funding pressures. Although most no longer have a significant backlog of sites to be entered, there is not always time or money for research to seek out evidence of a particular class of feature.

2.2.5 Summary

Levels of recording and legal protection have advanced since Pitt-Rivers' time, but there are still areas which fall outside legislation or have not been regarded as a valid part of the cultural heritage. The review above has covered major developments which have relevance to the study of Oxfordshire's water. Although many Acts for other purposes, such as Water Acts and those for major infrastructure projects like the Channel Tunnel Rail Link, may have an impact, only legislation specifically aimed at archaeology or historic buildings has been discussed.

While major changes to the Heritage Protection system had been planned but not implemented in full, one major development which might have a direct impact on water supply features is the development of new selection guides for Listing, three of which include water features. An expansion in the production of local lists of heritage assets is also underway, providing opportunities for smaller water features of local significance to be given recognition.

Changes to the EHA and HERs, with increasing concern for later post-medieval and modern features and attention to industrial monuments should also improve the recognition of water features as part of the historic environment. Indeed in some areas they have already provided a focus for more detailed studies.

2.3 Literature Review

2.3.1 Water specific

Holy wells, which were traditionally believed to have had their origins in the medieval or earlier periods, have inspired a substantial body of literature, both in print and through the internet. The term "holy well" has come to be used to refer to those water features with a

strong religious connection and to medicinal wells and springs. When the MPP programme was established holy wells were regarded as a particular monument class with its own description (Bond 1990). Illustrated catalogues of surviving features and possible past locations have been produced for many areas, such as Terry Faull's *Secrets of the Hidden Source* (2004), which covers Devon. Faull includes short sections on the possible origins of the wells and the various saints with whom they are associated. *The Holy Wells of Ireland* (Logan 1980) does not attempt to list all the wells in the island, but uses selected examples to explore the various rituals and pilgrimages, many of which have continued to the present day. There is no illustrated catalogue for Oxfordshire, but Rattue has published a list of past and present locations for the pre 1974 county (Rattue 1990; Rattue 1992).

Rattue has made a particularly important contribution to the study of holy wells in *The Living Stream* (1995), which explores the complex origins of holy wells and casts doubt on the idea that many have very early religious connections. He also discusses the impact of the Reformation and later social change on the wells and their rituals. The reduction in importance of holy wells and the growth of spas have been addressed in several books (Havins 1976, Bord 1985, Hembry 1990), with more recent ideas discussed in Walsham's *The Reformation of Landscape* (2011).

The recent growth of interest in alternative approaches to religion, typified by the use of crystals for example, and work to preserve rural traditions by the English Folklore Society and other groups have revived an interest in holy wells also. This has encouraged creation of various online journals, websites and email discussion groups, none of which seems to have had a very long life. Fifteen issues of the journal *Source* were published between 1985 and 1998, most of which are still available online, but *Living Spring*, established in 2000, only managed two. Other groups are the Wellsprings Fellowship,

which supports holy wells in Wales and the National Wells Index, founded to create a list for England and now part of 'Hereditarius' (http://hereditarius.org.uk/).

There is only a small number of books devoted specifically to the archaeology of water supply and most are primarily concerned with the technology involved rather than survival of features. *Roman Aqueducts and Water Supply* (Hodge 2002) provides in depth analysis, but Britain does not feature heavily. Roberta Magnusson does concentrate on Britain, as well as northern Italy, in *Water Technology in the Middle Ages* (2001) which discusses economics and social attitudes as well as the technology. Despite the claimed intention to address the human aspects of water supply, this book does not really engage with the issues of social organisation and water supply for ordinary people. The technology of the medieval period is also included in *Cathedral, Forge and Waterwheel* (Gies & Gies 1994), but only very briefly. The water supplies of both urban (Bond 1993) and rural (Bond 1989) monastic sites have been explored in broader works on the monasteries in the BAR series. *The Archaeology of Water* (Chapman Davies 2008) covers the subject of water supply from the prehistoric period onwards, using Surrey in particular as a source of examples. However, the book is episodic rather than providing a coherent narrative and again there is little engagement with the relationship between social organisation and access to water. It is interesting that examples of surviving features from France are also used although there is no direct comparison of attitudes in the different countries.

Davies' book includes a section on London, featuring the work of Snow and Bazelgette. The former is the subject of *The Medical Detective* (Hempel 2006) and features in Steven Halliday's *The Great Stink of London* (1999) along with the construction of London's sewers by Bazelgette. Halliday also addresses these topics in *Water: A Turbulent History* (2004) which covers many other aspects of water also, including spas and the New River

to supply London. The water wheel pumps supplying London from the Thames feature in *Old London Bridge Lost and Found* (Watson 2004).

Probably the best book on water supply in more recent times is *Water Towers of Britain* (Barton 2003). This Newcomen Society publication combines a clear description of the various types of water tower with a gazetteer and distribution maps for known sites. The incompleteness of this record is acknowledged and information on additional sites is warmly welcomed by Barton.

Some water companies have published their own histories, for example the South Essex Waterworks Company to celebrate its centenary in 1961. The surviving large pumping stations which now operate as museums, including Papplewick in Nottinghamshire and Kew, maintain useful websites as well as holding material on site. Although Thames Water, which serves Oxfordshire, has archives, these do not appear to contain significant material from the county. The engineering company Hyder Consulting plc has evolved from the Chelsea Waterworks Company, founded in 1722, and the history of the company and the expansion of its operations across the world is given in *Chelsea to Cairo* (Roberts 2006), which includes some descriptions of water supply technology.

The history of water supply and sewage forms the introduction to *Running Water* (Hall 1989), most of which is devoted to short histories of the large water companies, although the story of Thames Water is dominated by London. Peter Naylor's *Water Supply* (2005) is a disappointing publication from Shire Books. Their books are always brief, but this one only really considers the supply of towns from the middle of the 19th century and 40% of it is taken up by a list of water companies and their reservoirs which are open to the public.

The Oxfordshire HER and the NMR in Swindon were able to provide lists of sites associated with water supply and the HER does hold some useful detailed information for several of these. The Centre for Oxfordshire Studies, Oxfordshire Record Office and various museums across the county also hold much unpublished material including plans and photographs. However, none of these sources has made an attempt to draw information together in the way that has happened in other parts of the country. Northamptonshire CC features its County Heritage Sites (those it owns or acts as guardian for) on its website and provides location maps and information plaques, including those at King's Sutton Well-Head. Lincolnshire Museums published a series of Information Sheets for some of its archaeological sites which included the Grantham Conduit (White 1979) and St Mary's Conduit, Lincoln (White 1980). Norfolk CC has a website called Norfolk Heritage Explorer. which allows searches relating to a particular class of monument. A search for water supply produced an essay on the history of water towers as well as a list of individual sites.

Archaeological excavations have always recorded the presence on sites of features such as wells. These have not generally been the main focus of the work, but the Roman water supply of London has proved of tremendous interest and seized popular imagination. The remains from Gresham Street included sufficient parts of a bucket chain system for a working reproduction to be constructed outside the Museum of London. The work was written up in Current Archaeology (Blair 2002) and published as a book (Blair & Hall 2003). Gresham Street also held a medieval Jewish Mikveh or ritual bath (Blair *et al.* 2004), while the post-medieval water supply of the centre of Cambridge (Dickens & Cessford 2007) and the toilets from a York slum (Connelly *et al.* 2008) have also merited special interest. The increasing recording of excavated water supply features, particularly those from more recent periods, is encouraging.

Books about how water is used, without an archaeological focus, have been published. *The Story of Water Supply* (Robins 1946) still provides a good introduction to the subject and includes a number of examples from Oxfordshire. The evolution of bathrooms and bathing is covered in *Clean and Decent* (Wright 1980) and the issues surrounding cleanliness have been explored more recently in two books called *Clean*, the first subtitled '*a history of personal hygiene and purity'* (Smith 2007) and the second '*An Unsanitised History of Washing'* (Ashenburg 2008). While covering much of the same material the approaches are substantially different. Both develop ideas about people's attitudes to water and how it is used, themes which are also explored in *Take Me To The Source: In Search of Water* (Wright 2008) and *The Meaning of Water* (Strange 2004). The former deals with some very recent issues, including the craze for bottled water in places where there is a perfectly safe and plentiful supply from the tap.

2.3.2 Social and local history

Social history books do not generally focus on water supply as an issue of particular concern, a major exception being Booth's *Survey of London Labour and People* (1892), in which the classification of housing depends to some extent on the presence of taps, sinks and WCs. The provision of baths and drinking water as a public health issue is considered in several articles, Gibson (1954) and Stern (1959) as well as *Public baths and health in England, sixteenth to eighteenth century* (Mullett 1946).

Attitudes of landowners and public authorities to water supply do emerge in less specific studies, such as recent books on the Verney family of Claydon, Bucks by Broad (2004) and Tinniswood (2007) and in Rowley's *The English Landscape in the Twentieth Century* (2006). *Lark Rise to Candleford* (Thompson 1954) was written as biography, but provides a window into the life of the rural poor in open and closed villages at the end of the 19th century. Hunt's *Building Jerusalem* (2004) is a study of the role of local

authorities and entrepreneurs in the development of the Victorian cities, including their water and sewage systems.

A particularly good example of a book which combines social history with studies of buildings, including their water supply, is Darley's *Villages of Vision* (1994), which charts the history of planned villages into the 20th century. This explores the motivations behind their construction and describes aspects of life for their residents. Another useful title is *A Social History of Housing 1815-1970* (Burnett 1978).

There is a good range of books on society in rural and urban locations against which to frame questions on water supply. Several have Tom Williamson as at least co-author, including *Property and Landscape* (1987) and *The Archaeology of Landscape* (1998). Other books in this area are *Village and Farmstead* (Taylor 1984), *Lord and Peasant in Nineteenth Century Britain* (Mills 1980) and *Village Life and Labour* (Samuel 1975). For Oxfordshire there are a detailed study of two villages given in *Estate Villages Revisited* (Havinden 1999), and *Memoirs of the Cholera in Oxford* (Acland 1856). The work of Snow and Bazalgette in London is covered in *The Great Stink of London* (Halliday 1999) and there are many other books and articles on these topics.

2.3.3 Architectural history

Water supply receives very limited attention in most books on architecture and, in addition, buildings associated with the upper end of social scale tend to be better represented in the literature than vernacular buildings. There is a series of period volumes on great houses published by the Oxford University Department for Continuing Education (OUDCE), based on papers given at annual conferences, but aside from Marilyn Palmer's paper on *Comfort and Convenience in the English Country House*

(Palmer 2000), relating to the Edwardian period, these had nothing to contribute to this topic. In 2010 a conference was held at OUDCE on technology in country houses and the subsequent publication *Country House Technology* (Barnwell & Palmer, 2012) makes reference to their water supplies. Many books, such as Airs' *The Tudor & Jacobean Country House* (Airs 1995), only contain passing references often from accounts of wages and material costs.

Studies of specific buildings or estates can be more rewarding. Blenheim and its estate, including its water supply, have been studied by Bond and Tiller (1987), Green (1951) and Bapasola (2009).

The English Home (Priestley 1970) and *Life in the English Country House* (Girouard 1978) both contain specific discussions on the topic and indeed Girouard also addresses water supply on a town-wide scale in *Cities & People* (1985). Barley's books, *The English Farmhouse and Cottage* (1963) and *The House and Home* (1961), plus *Housing in Urban Britain 1780-1914* (Rodger 1989) probably provide the most useful surveys of middle and lower class housing.

Consideration of tenements, an important type of housing in the later 19th and early 20th century, is most comprehensive for London, where they were linked to social reform. There were few examples in Oxfordshire, but the archives of Christ Church included plans of both Christ Church Old and New Buildings in St Thomas Parish.

Although water supply is not always discussed, it is often possible to obtain incidental information from plans showing the layout of buildings. Examples include Hinchcliffe's *North Oxford* (1992) and the Oxoniensia articles on Oxfordshire housing (Graham 1970,

Morris 1971, Paine *et al.* 1978).

Pevsner's series, *The Buildings of England*, provides county by county coverage. Each volume includes introductory essays followed by a gazetteer in which all buildings and structures regarded of interest by the authors are described for each settlement. The selection inevitably reflects the prejudices of the authors and the number of entries for water features is limited. Many of the earlier titles in the series are under revision; the new Buckinghamshire was published in 1994 and the volume for Berkshire in 2010. The volume for Oxfordshire was about the last of the first set to be produced, in 1974.

Pevsner's work and the Inventory volumes from the RCHME provide the basis for many of the Listed Buildings descriptions. EH has now made these lists accessible through the internet and in the late 1990 commissioned *Images of England*, for which a team of volunteers aimed to photograph every Listed Building with the results published on the web. By the time the project ended not everything had been photographed and some owners had declined to allow publication, but this is still a valuable source.

For structures rather than buildings, Shire Publications provide a number of useful guides including *Street Furniture* (Aaron 1980), *Public Parks* (Conway 1996) and *Cast Iron* (Fearn 2001). Other useful titles in this area are *Vanishing Street Furniture* (Warren 1978), *Troughs and Drinking Fountains* (Davies 1989). The Public Monument and Sculpture Association is developing an online database of features, but so far the coverage has not extended to Oxfordshire (http://pmsa.cch.kcl.ac.uk/).

2.3.4 Legislation, policy and management

There is a limited number of published books dealing with this field. As well as historical reviews of the development of historic environment legislation such as *The Future of the*

Past (Fawcett 1997) and *Preserving the Past* (Hunter 1996) there are a few general books on managing the historic environment, of which the most useful are *Managing Archaeology* (Cooper et al. 1995) and *Archaeological Resource Management in the UK* (Hunter & Ralston 1993). The legislation itself is covered in *Listed Buildings* (Suddards & Hargreaves 1996) and *Archaeology and Law* (Pugh-Smith et al. 1996) among other books. The majority of literature is, however, in the form of articles and publications from government and heritage organisations.

Official policy and legislation are subject to frequent change, for example the replacement of PPG 15 and 16 by PPS 15 and then the NPPF, but fortunately much is now available to download from the internet. It is possible to obtain copies of everything from Acts of Parliament and government circulars to press releases from the various departmental websites or the HMSO site, but sometimes this requires considerable effort, not helped by alterations in responsibilities and names for ministries and the limited time for which some documents remain available.

English Heritage is the most important organisation in the field of historic environment management and publishes large amounts of material. Although many journals, *British Archaeology*, *Antiquity* and *The Archaeologist* for example, publish articles the most important is EH's *Conservation Bulletin.* Again much of EH's output is available from their website. The Historic Environment – Local Management (HELM) pages carry an extensive guidance library. Other material is available via particular project pages.

Other good sources of management related literature are the sites maintained by the Archaeological Data Service (ADS), the Council for British Archaeology (CBA), the Institute for Archaeologists (IfA) and the Society of Antiquaries of London. The Association of Local Government Archaeological Officers (ALGAO) commissions

projects and has a potentially useful website. The Institute of Historic Building Conservation (IHBC) provides little material to non-members at least.

Management and legislation represent an area where constant vigilance of new initiatives and publications is required. The historic environment is now regarded as newsworthy and the mainstream press regularly carries news items. The Society of Antiquaries produces a regular news update, SALON, and Heritage Link, a charity supported by a range of different heritage bodies, has issued its own bulletin since 2007.

2.3.5 Theory and Methodology

Theory plays a major role in archaeology and there is no shortage of books on the topic. There is a tendency for theoretical studies to focus on the prehistoric period, probably because the lack of contemporary documents leaves scope for exploration of ideas. The other field from which examples are frequently selected is post-colonial archaeology. Similar arguments and changes in perspective to those seen in archaeology texts were found in those devoted to historical theory. The names of leading archaeological theoreticians include Trigger (1978), Hodder (1986), and Tilley (1993). Their works do not always use accessible language, as they explore complex ideas and apply specialist jargon. Renfrew and Bahn in *Archaeology: Theory, Methods and Practice* (2004) and *Archaeological Theory: an introduction* (Johnston 1999) attempt to clarify the language and ideas, using flow charts, lists of key points and glossaries. Several more recent texts consider the concepts associated with materiality, including *Archaeologies of Materiality* (Meskell 2005) and *Archaeology and Modernity* (Thomas 2004). Interest in material culture has revived, generating numerous books including *The Oxford Handbook of Material Culture Studies* (Beaudry and Hicks 2010).

There is an increasing number of publications relating to industrial and post-

medieval/historical archaeology. To some extent both disciplines are still trying to justify their place within archaeology, and indeed Little's *Historical Archaeology* (2007) is subtitled *Why the Past Matters*. Historical archaeology had its origins in the USA and most books and articles still have a bias towards that country. An influential text was *In Small Things Forgotten* (Deetz 1996), first published in 1977. The range of case studies in these books is developing a wider, international focus and there are now some books relating specifically to Britain, such as *The Familiar Past? Archaeologies of later historical Britain* (Tarlow & West 1999). Water supply does not feature strongly in historical archaeology, but one study has focused on the electrical supply of Annapolis (Meskell 2005), which provides an interesting parallel. Another useful publication is *The Cambridge Companion to Historical Archaeology* (Hicks and Beaudry 2006).

Books and articles on industrial archaeology both explore the recognition by practitioners that it needs to widen its approach, moving away from recording the evidence for industry to that of industrialisation, placing the work in a broader social context. This view is addressed in *Industrial Archaeology: Principles and Practice* (Palmer & Neaverson 1998) and *Perspectives in Industrial Archaeology* (Cossons 2000), the main theoretical texts. In 2012 the Council for British Archaeology published *Industrial Archaeology: A Handbook* (Palmer et al. 2012), which includes a short section on water supply. Articles on industrial archaeology topics appear in many journals, particularly *Post-medieval Archaeology* and those produced by the Association for Industrial Archaeology (AIA), few of which are concerned with the underlying theory. Theory features very strongly in papers presented to the Contemporary and Historical Archaeology in Theory (CHAT) conferences, but is rarely mentioned at the AIA annual conference.

Numerous studies exist which look at how history is seen by historians. Among other themes, these chart the change from a concern with great figures and major events such

as battles to a broader geographical and temporal canvas. The growth of social history and its relationship to social theory, the role of local history, such as whether it is really 'history' and the place of post-colonial history or women's history are all pursued by writers including Burke (1992, 2001) and Tosh (2002). This evolution of different approaches to history, culminating in postmodernism follows a very similar path to that followed by archaeology.

Few books and articles relating to local history seem to consider theoretical issues, but there is an acceptance that the basis for the work needs to be understood. In *Approaches to Local History* (1972) Rogers compares place-centred and people-centred starting points. Tiller has produced a good general guide to local history, *English Local History: An Introduction* (1992), and in 2006 wrote an article for *The Local Historian* which explored the relationships between local history in local and academic approaches and also the place of family history. The need for consideration of a wide range of source types is a recurring theme.

The theoretical basis for studies in architectural history seems very limited and surprisingly this does not appear to be regarded as something for which there is a particular need (Malcolm Airs *pers. comm.).* Only one published text, *The Rise of Architectural History* (Watkins 1980) was identified, and in journals too there was a lack of articles which address any theoretical underpinning for work in this area although the relationship with the development process receives some attention. Generally the technical and artistic elements are seen as of major importance with little need to place developments in a wider context.

In the field of vernacular architecture the position is a little different. The journal

Vernacular Architecture has included articles on the interaction of building recording with documentary sources (Vol 32 2001, 35 2004) and Christopher Dyer has written about the relationship between history and vernacular architecture (VA Vol 28 1997), albeit from the historian's perspective.

2.3.6 Oxfordshire

Most of the books relating to Oxfordshire fall under the category of history, although there are a few relating to its geology and water supply, e.g. Tiddeman's survey of Oxfordshire (1910) and Blake for Berkshire (1902), published by HMSO. The earliest books containing significant information about water in Oxfordshire are Plot's *Natural History of Oxfordshire* (1676) and Wood's *Survey of the Antiquities of the City of Oxford'* (compiled 1661-6, Clarke 1889), with a section devoted to wells.

The primary historical source for Oxfordshire is the Victoria County History. As the name suggests, publication of the volumes, which were intended to cover the whole country, began in the time of Queen Victoria. Due to financial constraints the Oxfordshire series was delayed and coverage is still incomplete, although work is actively underway. Lack of coverage for some areas is unfortunate, but the delay does mean that the scope of the published volumes has expanded beyond manorial and church history to encompass economic and social development, in many cases giving a summary of the water supplies in a parish. The contrast is very clear when the Berkshire volumes from the 1920s, covering those parts of Oxfordshire added in 1974, are studied and found to be of very limited use. The VCH now supports a supplementary research series, *England's Past for Everyone*, which produces location specific volumes including one on Henley-on-Thames (Townley 2009).

A wide range of books has been published relating to specific places, and these were a

valuable source. However, the information content of local histories has generally decreased in recent years in favour of collections of photographs with a short commentary. Some of these photographs show water features, but discovering more about them presents challenges. There are of course exceptions, such as Angela Spencer-Harper's book on Highmoor and Stoke Row (1999), which is unusual in that the wells were one of the major inspirations behind the work. Anecdotal histories can be valuable, such as the Oxfordshire Federation of Women's Institutes' … *within Living Memory* (OFWI 1994), in which the difficulties of poor water supply for women are an important theme. The *Oxfordshire Village Book* (1999), from the same source, also includes reference to water supply in many of the entries.

Many other books on Oxfordshire have been published, with varying degrees of reference to water supply. The *Encyclopaedia of Oxford* (Hibbert 1988) contained several useful entries; the city has inevitably received more attention than the rest of the county.

More general books and articles often use Oxfordshire examples, the Headington Quarry area features in *Village Life and Labour* (Samuel 1975) for example and *Chiltern Privies* (Harris & Chapman 1984) covers part of the county.

Many local societies and groups maintain a website and the internet is of increasing importance. Tackley Historical Society published an article on the village water supplies (Rupert Hall & Corby 2000) and recently the Jericho public baths have featured on another site (http://www.jerichocentre.org.uk/).

Relevant articles on aspects of Oxfordshire life appear in various journals, including the *Journal of the British Waterworks Association*, which published a comprehensive history of Oxford's water supply (Crawley 1947). The county journals, *Oxoniensia, Berkshire*

Archaeological Journal, South Midlands Archaeology and *Local History* all provided some useful articles on topics such as working class housing (Paine 1978) and the laundries of Headington (Jenkins 1998).

Thames Water has become the water supply company for the whole county, taking over all the smaller companies surviving at its formation in 1973. It would be expected that many of these companies would have had archives, which may also have passed to Thames Water. The company does maintain some archives, for the large pumping stations at Crossness and in London for example, but it did not prove possible to obtain any information about Oxfordshire or to access any records. Fortunately archives held by parts of the University of Oxford were more accessible, including those of Christ Church and the Oxford University Press. Various university libraries were consulted, some of which contain unpublished material, such as Acland's report on cholera in Oxford (1856) and Margaret Hauser's dissertation on the well at Bablock Hythe (1998). Access was also gained to the National Trust archives for Buscot and Coleshill, both estates having complex water systems.

As mentioned above, the HER background files can contain useful material. The Centre for Oxfordshire Studies proved an even more valuable repository: in addition to its book collection it holds a selection of pamphlets, articles and cuttings indexed by place. These include a paper by Malcolm Graham on drinking fountains in Oxford itself (1991) and David Clark's detailed study of the Hinksey Conduit (1997). There is also an extensive collection of maps, from early estate maps through to modern OS maps at different scales, and a photographic archive. Detailed examination of local government and other official transactions in the Oxfordshire Record Office was made. Information about the later 19th century improvements to Oxford's mains water supply included a map of the pipelines to the New Hinksey treatment works.

Newspapers have proved a source of references to particular sites, generally through nostalgia articles and photographs rather than contemporary articles, for example the story of Witney's water tower generated an exchange of letters in the Witney Gazette. Even where archives have been digitised, a random trawl for references to terms such as 'water' or 'pump' will be frustrating and for paper or microfilm records too slow to be worthwhile. However, more recent restoration projects, such as the St Clements Fountain in Oxford, can be followed though newspaper reports.

2.3.7 Internet sources

The internet has proved an invaluable source of information for this research, providing access to numerous relevant sites, news items and discussions. As well as answers to specific queries, useful data or ideas for new directions to pursue have been obtained using broad search parameters in a fraction of the time required to browse in libraries and archives. There is also a wealth of complete published articles available to download, even without use of the subscription facilities available through the University of Oxford system. These articles and many webpages also contain useful bibliographies. Online library catalogues and indices to journals in themselves greatly reduce the time spent in tracking down copies of printed material.

Internet search engines can be difficult to steer in an appropriate direction and there are certain sites, such as Wikipedia, which need to be used with a degree of caution, but the effort is usually productive. Searching for images is particularly difficult, away from specialist sites such as *Images of England* or *Viewfinder*, both maintained by EH. Effective results rely on a judicious choice of words for the search. Google Earth and the satellite images on Google Map are useful in checking locations as are the road maps. Historic maps showing the existence of features in the past are very important and online

access allows checks to be made rapidly. Although OS maps are available to all, use of *Edina* through the University provides a wider range of dates and scales. The other particularly useful online map source is *MAGIC*^{TM}, a government-funded initiative, providing a modern base map from which accurate grid references can be obtained instantly.

2.3.8 Personal contact

Even using the range of sources discussed above, the existence of many sites and the history associated with many more is not a matter of public record. Chance encounters, with curious passers-by or at social events, and conversations generally, can tap into this information. A speculative email from the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT) to Oxford Archaeology for help led to the author's involvement in a restoration project in Little Milton for example. The value of local contacts cannot be overstated and the level of response has demonstrated that there is more interest in the topic of water supply than might be imagined from the historic environment literature and records.

2.3.9 Summary

For an interdisciplinary study such as this, the range of possible sources is extensive, and as described in Section 1.4 these extend well beyond the published and unpublished literature. One area where the literature is essential is in providing the theoretical underpinning for the themes and ideas developed in relation to water supply.

3 DEVELOPMENT OF WATER SUPPLY IN THE POST-MEDIEVAL PERIOD

3.1 The Geology of Oxfordshire

3.1.1 Solid geology

Geology was the most important factor governing the availability of water before modern provision of long distance pipelines, storage reservoirs and pumping stations. The availability of water was a major consideration in the selection of sites for early settlements and thus locations show a strong correlation with geology. Distribution maps for Oxfordshire show settlements located along the lines of rivers and streams or on those parts of the hillsides where springs and ponds might be found.

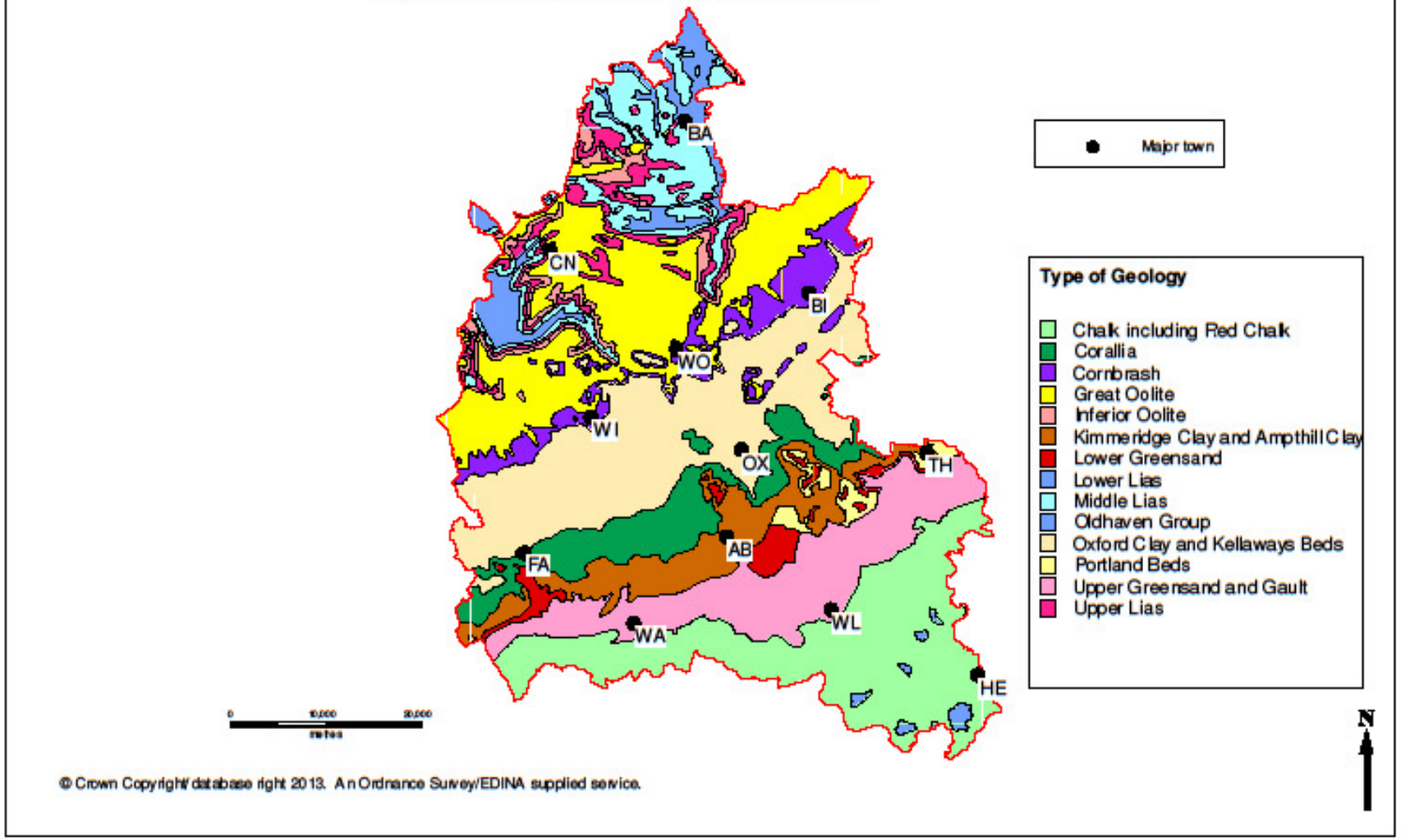
The earliest geological strata which reach the surface in Oxfordshire are the Lias beds, created in the Lower Jurassic period. The full geological sequence from that period until the present is shown in Table 3.1, based on Arkell (1947). Material produced from the Pliocene to the present is generally referred to as drift geology and has much less influence on the landscape than the underlying solid geology.

Date	Stratum	Description
Holocene	Alluvium, peat, tufa.	Deposits of silt etc. produced by river flooding.
Pleistocene	River gravels	Deposits produced by changes in rivers.
	Glacial drift	Quartzite-rich gravels, legacy of Anglian glaciation.
	Pebble gravels	Mostly flint pebbles.
Pliocene	Sands and gravels	Brought in by advancing ice and left on its retreat.
	Fossiliferous sandstone	Formed by retreat of sea.
Eocene	Bagshot Beds	Unfossiliferous sands.
	London Clay	Unfossiliferous marine clay.
	Reading Beds	Marine sands.
Upper Cretaceous	Chalk	Fossiliferous deep sea deposits, lower layer with marl, middle and upper containing flint.
	Upper Greensand	Layers of sand and sandstone.
	Gault	Green mudstone.
Lower Cretaceous	Lower Greensand	Gritty sand with some ferrugineous sandstone.
	Wealden Beds	Sand, ironstone and clay.
Upper Jurassic	Purbeck Beds	Limestone
	Portland Beds	Limestone
	Kimmeridge Clay	Marine mudstone with sand and sandstone inclusions.
	Corallian Beds	Limestone, marl and sandstone.
	Oxford Clay	Shelly mudstone.
	Kellaway Beds	Sands.
Middle Jurassic	Cornbrash	Hard, shelly limestone.
	Great Oolite	Coastal marine limestone.
	Inferior Oolite	Sandy limestone with some mudstone.
Lower Jurassic	Upper Lias	Mudstone with some limestone, then sandstone.
	Middle Lias	Mainly mudstone, iron rich marlstone.
	Lower Lias	Mudstone with some limestone and then sandstone.

Table 3.1: Geological Sequence for Oxfordshire

Since the Jurassic and Cretaceous dip to the south east, the strata are exposed along bands running north-east to south-west across the county. The youngest rocks, chalk, appear in the south. The solid geology of Oxfordshire is shown in Figure 3.1.

Figure 3.1: The Solid Geology of Oxfordshire



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3.1.2 Natural water sources

The River Thames runs west to east across the middle of the county, before turning south at Oxford and then forming the boundary between Oxfordshire and Berkshire in the south-east corner. On the western side of the county the Evenlode, Windrush and Ock all flow west to east into the Thames while the Cherwell and Thame join it from the north. Together with their network of tributaries these rivers supply plentiful water for large areas, although there are significant dry regions in the north and the south-east. 1:250,000 Ordnance Survey maps show a particularly high density of wells on the chalk.

Figure 3.2 illustrates how different water sources arise from geology and topography.

Rainwater either runs off, joining streams and rivers, or soaks into the ground. The balance between surface water and ground water depends on the porosity of the rocks and the slope of the ground. Clays absorb little water so there will be many streams in these areas, which in Oxfordshire are found in a band across the middle of the county along which run the Thames and Ock.

Porous rocks, such as chalk and limestone, absorb most of the water, although at different rates. Water continues to sink until it reaches the level at which the rock is saturated, the water-table. This level alters with topology and climatic conditions. If the water-table lies level with a valley bottom a stream can result.

Where porous rocks overlie non-porous ones such as clay, water cannot continue to drain downwards and is trapped in the rock where it can be exploited by wells. Normally the water needs to be pumped or scooped up, but if the well head lies at a lower level than the outcrop of the porous rock it will rise naturally, producing an artesian well (Figure 3.3) (Trueman 1946, 241). One was sunk in St Clements (OX136) in 1832, but it apparently

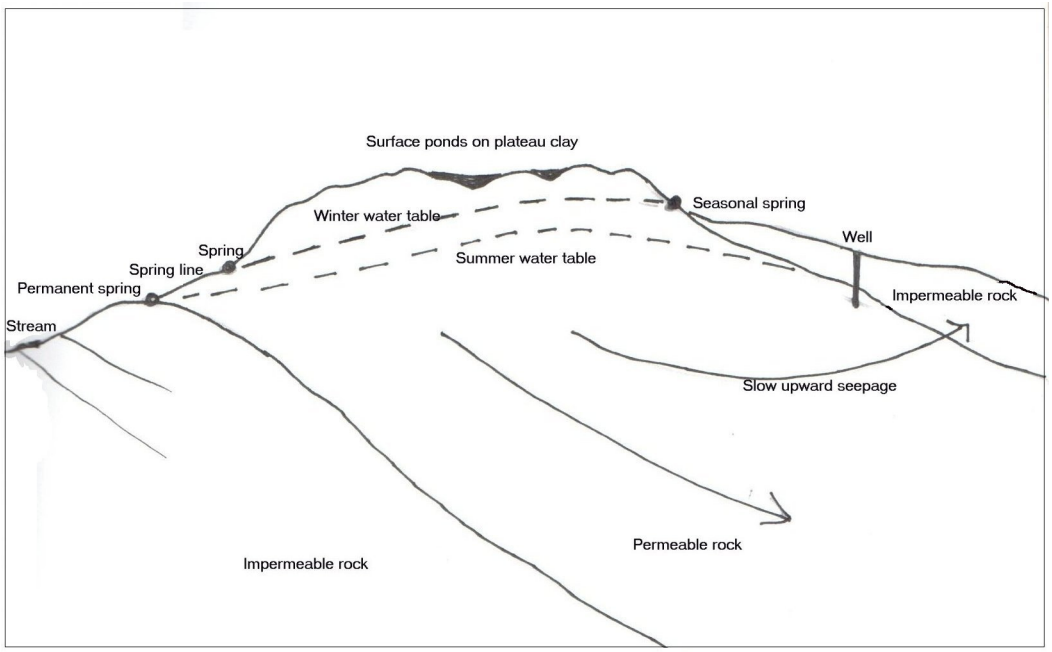


Figure 3.2: Spring Formation

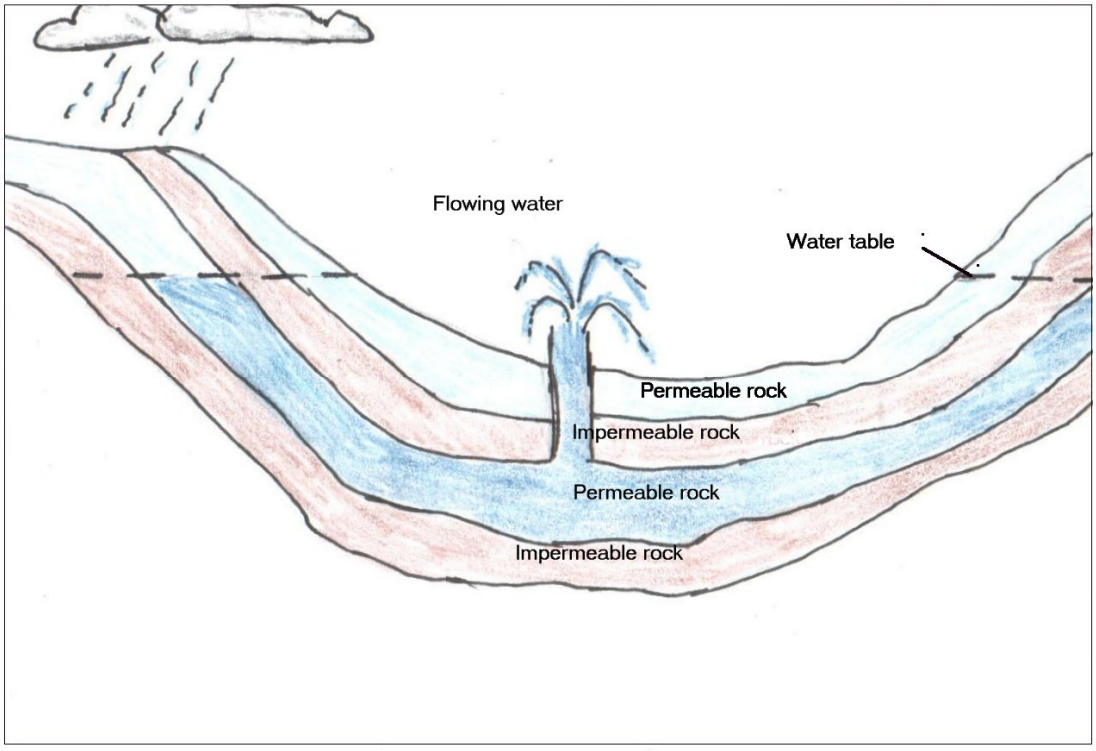


Figure 3.3: Artesian Well Formation

no longer exists (Tiddeman 1910, 24-89).

Where porous rock outcrops above an impervious layer below, water will tend to seep out along the boundary, producing springs. The spring line was a popular location for settlement in the medieval period as illustrated by the distribution of villages from Childrey across to Harwell on the outcrop of Upper Greensand, between the Gault Clay to the north and chalk to the south (Martin & Steel 1954, 160).

In the chalk areas of Oxfordshire, in the south-west around Henley for example, patches of plateau clays survive. These deposits of clay mixed with flint appear to have been formed by geological action on the chalk and the overlying and eroding Reading Beds. These high clays sometimes produce ponds.

Ground water has a chemical effect on buried rock. Rainwater is slightly acidic and reacts with certain rocks, particularly carbonates such as chalk and limestone, producing soluble salts. The mineral content of water in Oxfordshire is notably high, particularly in sodium chloride (Mullett 1946, 16), and this is thought to account for the number of healing wells recorded, with treatment for eyes a common speciality (Rattue 1990, 173-6). The artesian well in St Clements (OX136) was rich in sulphates.

3.2 Early settlements

3.2.1 Settlement patterns

Reliable water supply has always been a major factor in the selection of occupation sites. Oxfordshire is well served with rivers and distribution maps of known archaeological sites from the prehistoric period show that they are most common near water (Briggs et al. 1986, Maps 3,5,7). The bias is less pronounced for the Roman and early medieval

periods, but still clear (ibid, Maps 9,11,13). Over time the influence of geology, controlling the presence of springs or the ability to obtain water from relatively shallow wells, is apparent in the distribution of settlements. In the Upper Thames Valley settlements are most common on the edges of gravel terraces and on higher ground where spring lines run along the base of the chalk on the Berkshire Downs or the Oolite dip-slope (Martin & Steel 1954, 158-60). Even today there are few settlements of any size in the south-east of the county on the chalk. The distribution of settlements in relation to geology is shown in Figure 3.4.

3.2.2 Place-names

Place-name evidence also demonstrates that water played a significant role in the choice of settlement sites. Most obvious are those which end in 'well', which means 'spring' in this context, or 'ford', or 'brōc and 'burna'. Oxfordshire has a number of 'Brightwell' or 'Britwell' names and the '-ford' selection includes Oxford. However, there is a host of less obvious terms, mainly derived from Old English, which relate to water. These have been studied in some detail by Gelling (1984), who has identified those listed in Table 3.2.

Term	**Meaning**	**Oxfordshire Example**
ae welm	river source	Ewelme
brōc	stream, brook	Begbroke, Fulbrook
burna	stream	Shirburn
ēa	river	Eaton Hastings
lacu	small stream	Standlake
laece	big stream	Latchford
mere	pool, pond, lake	Finmere
pyll	small stream	Only field names
rith, rithig	small stream	Cropredy
waeter	water, river, lake	Waterperry
well, wella, welle	spring, stream	Fulwell
eg	island	Witney
fen	fen	Fencott
hamm	land surrounded with water, river meadow	Culham
mersc, merisc	marsh	Murcott

slæp	slippery place	Islip
ford	ford	Wallingford
gelãd	difficult river crossing	Hafocgelad in Haseley
hyth	landing place	Bablock Hythe

Table 3.2: Oxfordshire Place-names

The other parts of the name are often derived from the name of a person, probably the landholder e.g. 'Epwell' is 'Eoppa's Spring' (ibid, 31). The other common modifiers are physical description or natural feature. 'Broadwell' is self-explanatory, but the meaning 'cress well' from 'Carswell' is less obvious (ibid, 31). It is still possible to find in fairly original condition some of these features which gave the settlements their names and provided a water supply. Examples include springs at Fritwell (CH027), Fordwells (WO002) and Gagingwell (WO130) (Plate 3.1a). Ponds survive at Fringford (CH065) and Sunningwell (VW029) (Plate 3.1b).

In the Chilterns names including 'well' such as Ewelme or Crowell are used for spring line settlements at the foot of the Chiltern scarp and where there are ponds the term 'mere' is found in, for example, Homer. As there is little running water, stream names like Shirburn are a rare exception, again at the scarp-foot (Gelling & Coles 2000, 58-60).

3.3 Historical Development of Supply and Technology

3.3.1 Continuity and evidence base

For the majority of the population, particularly in rural areas, the method of obtaining water underwent very little change from the medieval period until well into the 19th century or even beyond. Much of the surviving evidence for water technology before the 18th or 19th centuries comes from archaeological investigation, documentary sources and pictures. Although there are many features still in place from the later centuries, such evidence, together with early photographs and artefacts in museums remains an important

source of information. To provide a full discussion of the evolution of water technology in Britain the full range of evidential sources will be used, although the focus of this study is on surviving water supply features.

It is possible that some well sites remained in continuous use from the prehistoric period even up to the present day. However, the evidence for continuity in Oxfordshire is limited. The well (CH002) at Manor Farm, Noke (plate 3.1c), is covered by a probable 16th century building, but, when it was cleared out, worked flint and Bronze Age pottery were found in the bottom (Cheetham 1995, 420). A handful of holy wells, such as that at Tadmarton hillfort (CH034), have early origins, but are not still in use.

3.3.2 Prehistoric water supply

Rivers, streams and springs naturally provided humans with their first water sources. Methods for tapping these supplies more easily were soon developed and wells and waterholes have been uncovered during archaeological excavations on prehistoric sites such as Yarnton (Lambrick & Robinson 2009, 267-71). In Britain the earliest evidence comes from the lining materials used for prehistoric wells. Lining of wells with wickerwork, wood, clay and stone was adopted from the Neolithic period (Tegel et al. 2012, 1). Where the water was close to ground level, containers were easily filled, giving rise to the term 'dipping well'.

Draw wells were far more common than dipping wells, allowing deeper sources to be used. At their most basic a bucket was simply lowered on a rope and then pulled out filled. To reduce the effort required many different mechanisms were employed. The *shaduf* had its origins in Mesopotamia *c* 3000 BC (Gies & Gies 1994, 19) and consists of a long pole with the bucket suspended at one end and a counterweight on the other mounted on a pivot (Figure 3.5). The bucket can be immersed in the river by pulling on

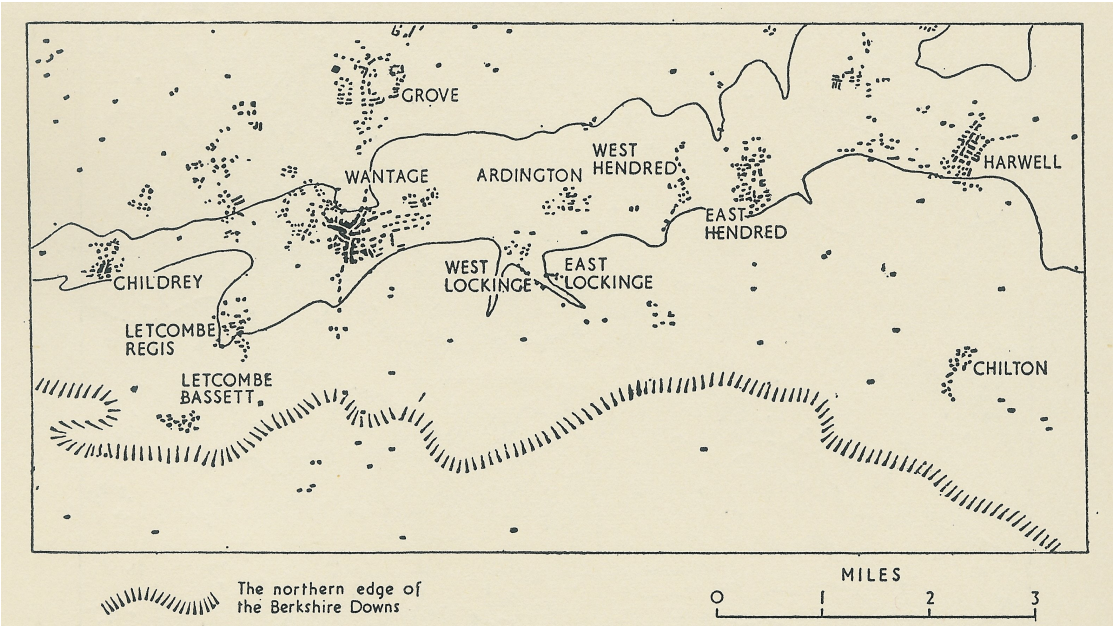


FIG. 57. Settlements along the northern foot of the Berkshire Downs. The area between the two lines marks the outcrop of the Upper Greensand; Gault clay lies to the north and Chalk to the south.

Figure 3.4: Early Settlement Distribution (from Martin & Steel 1954)

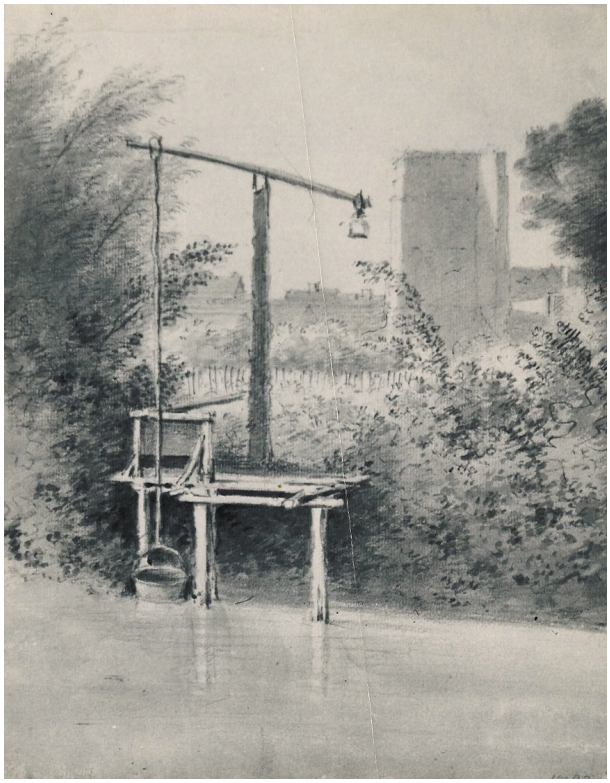


Figure 3.5: Shaduf (Malchair Drawing from Bodleian Library)

its rope and the weight helps to lift it when full. The device is a familiar part aspect of life in the Middle East today and, although there is no evidence for their use in Oxfordshire during prehistoric times, there was one in Oxford in the post-medieval period (OX073).

Various techniques for using wheels to extract water continuously were also developed at an early date in the east and Mediterranean regions, including the *saquiya* or tympanum, animal-powered water wheels equipped with scoops (Figure 3.6), bucket chains, windmills and the Archimedean screw (Figure 3.7). The last, invented *c* 250 BC (Gies & Gies 1994, 22), is used in modern sewage processing and wind pumps are now often used in rural areas for agricultural land, at South Moreton (SO156) for example.

Force pumps were developed by Ctesibius of Alexandria according to Vitruvius, writing *c* 100 BC (Shapiro 1964, 568). These pumps have two cylinders connected by flap valves (Figure 3.8). This technology, subject to improvement in materials particularly for seals, is still employed in water pumps, but from the late 15th century suction, or lift, pumps were developed (ibid, 574). Lift pumps, the most common, have a single cylinder divided in two by a flap valve (Figure 3.9). Both pumps can only raise water by about 10 m, the head of water supported by atmospheric pressure, and therefore will not serve for deeper wells.

3.3.3 Roman water supply

If settlements lay some distance from the source, water was conveyed along an aqueduct. The Romans were expert constructors of aqueducts and, throughout Europe, parts of stone constructions survive, the arches across the River at Avignon for example. No remains on that scale have survived in Britain, but evidence for channels supplying towns has been identified in excavations at Winchester, Hampshire (Fasham & Whinney 1991,



Figure 3.6: Noria (Creative Commons)

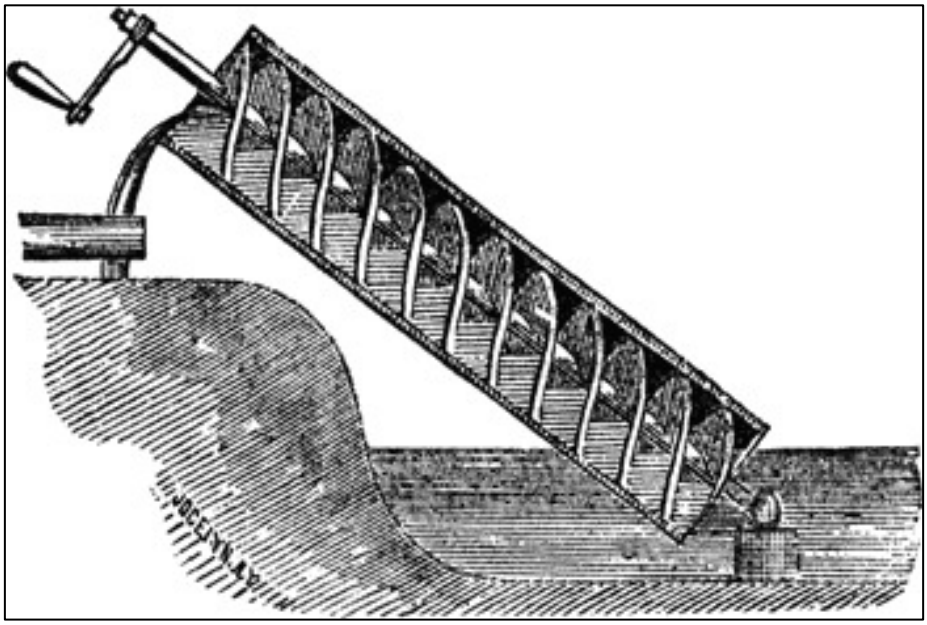


Figure 3.7: Archimedean Screw (from Chambers Encyclopedia 1875)

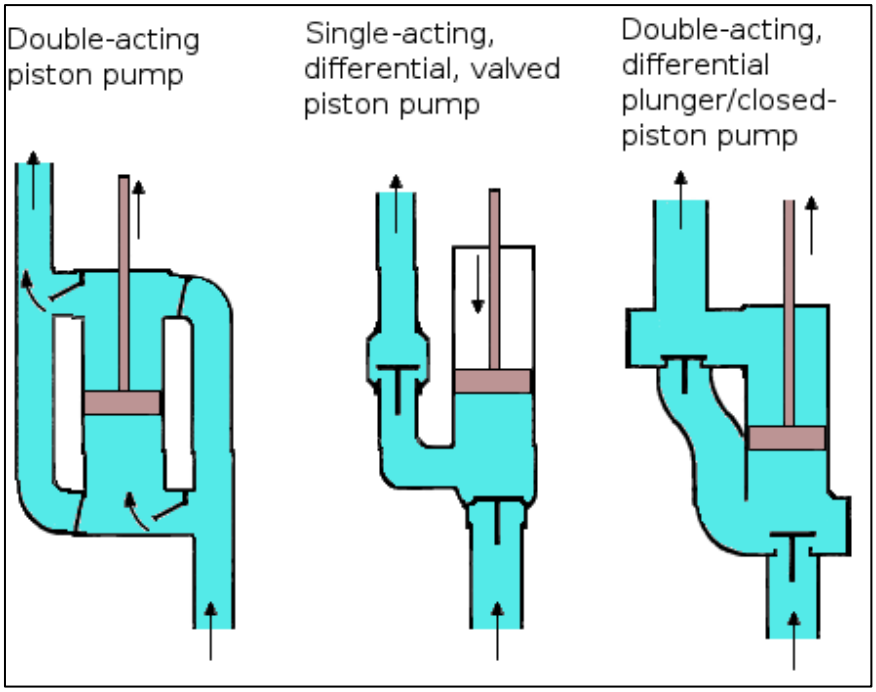


Figure 3.8: Force Pump (KVDP, Creative Commons)

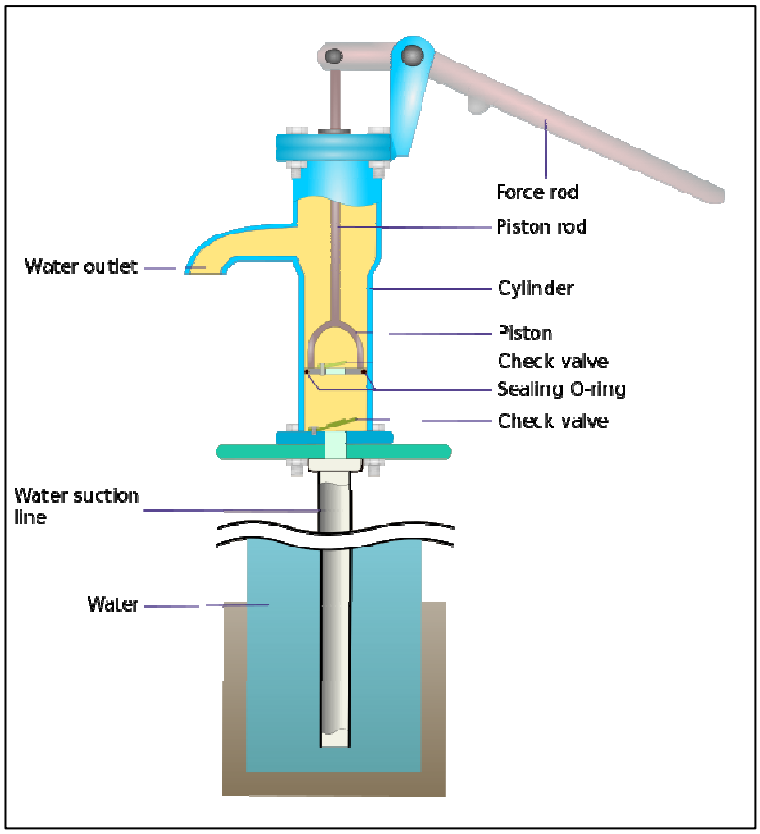


Figure 3.9: Lift Pump (Manco Capac, Creative Commons)

7), Dorchester, Dorset (Sparey Green 1987) and Lincoln (Jones et al. 2003, 117). Square-cut channels, sometimes on embankments, follow the contours of the land downwards (Fasham & Whinney 1991, 11).

In valleys, aqueducts were not always designed to cross at the level of the ground either side, but followed the valley slopes using the inverse siphon principle to raise the water to a slightly lower point on the opposite side (Smith 1999, 3). A hydraulic gradient creates sufficient pressure to produce the flow (Figure 3.10). It was this technology that allowed Oxford to obtain water from springs on the opposite side of the River Thames to supply the Carfax Conduit (OX016).

The Romans were adept in the use of bucket and chain systems, where a series of hollow wooden boxes are arranged along a chain loop which passes over a pulley at the top of the well shaft (Figure 3.11). The remains of such a system were excavated in Gresham Street, London, but the operating mechanism was not found. This may have been a simple treadwheel or a geared system (Blair & Hall 2003). No evidence for such systems has been found in Roman Oxfordshire, but one post-medieval pump in Rousham (WO023), discussed in Chapter 4, did utilise the technology.

3.3.4 Medieval water supply

Collection and transport

The application of technology to water supply began at a very early stage when ways to collect and transport water from natural sources were sought. Although the technology has become increasingly sophisticated, there is no continuum of progress. Some of the most basic technologies, such as the use of yokes and buckets to carry water, remained in use until the 20th century. More advanced devices, developed during the Roman period, fell into disuse and were not rediscovered for hundreds of years.

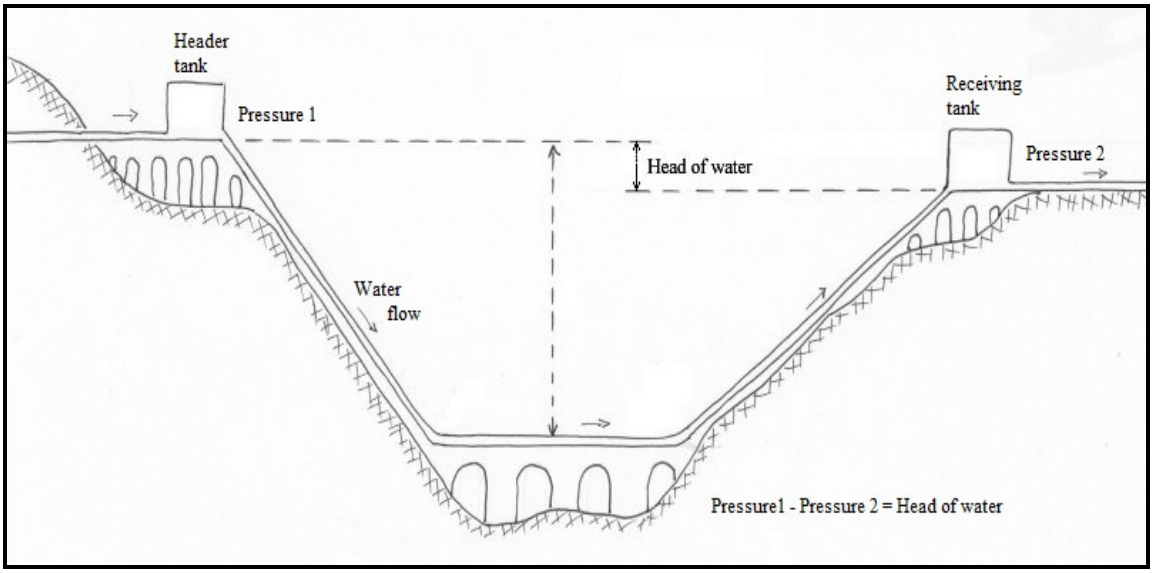


Figure 3.10: Inverse Siphon



Figure 3.11: Roman Bucket Chain (Pan narrans, Creative Commons)

Filling containers directly from rivers, streams and ponds is comparatively easy, but even so the water required distribution. In most cases this meant carrying the filled containers home, a job which often fell to women and children. Where the water source was more distant, and in urban areas where there was sufficient demand, professional water carriers were employed (Figure 3.12). Numerous images demonstrate the use of yokes, barrels hung from poles and tankards, rather larger than the modern version (Figure 3.13). These conical vessels holding about three gallons were used particularly by the Guild of Water Bearers in London, who by the end of the 15th century had 4,000 members (Barty-King 1992). Horses, donkeys and dogs all played a role in carrying water, and a set of saddlebags for the purpose was excavated in Carlisle (Mould 2007, 191).

Where natural springs emerge, a dipping well could be constructed simply by placing some kind of stone or brick box around the water to keep it clean. One survives by the side of the road in Newton Purcell (CH008) (Plate 3.1d), where a brick arch keeps out dirt. The well at Ledwell (WO038) is rather more elaborate, being fitted with steps down to the water, which is now within a Gothic style enclosure. Steps for access were still being provided in the early 20th century, including a set at Woodcote Pond (SO127). Some of these dipping wells have quite large tanks, at Hethe (CH066) for example, which may have been used as communal washing places.

A variation on the dipping well still survives in Hook Norton. The village lies on the sides of the valley of a tributary of the River Swere, into which several springs feed. At several locations around the village the springs were tapped part way down the hill and channelled into troughs. These tites (CH054, 055, 172), as they are known, supplied the village until 1954 when mains water was connected, but local residents resisted their loss (Hook Norton Museum).

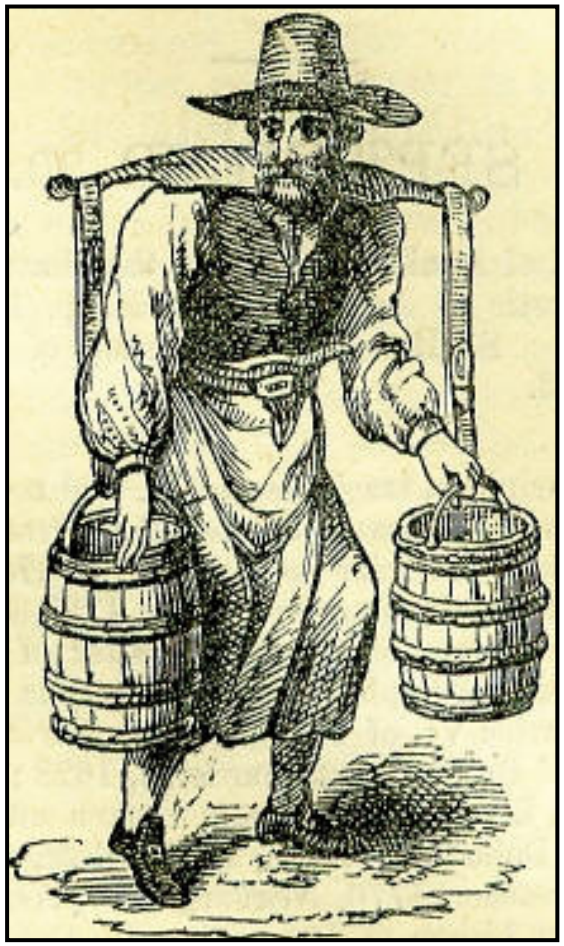


Figure 3.12: Water Carrier

(from Chambers, 1883)



Figure 3.13: Water Tankard

(from Green 1900)

Winches are still common parts of draw well assemblies, relying on the mechanical advantage of differentially sized wheels to make the task of raising water less onerous. Animals could also be employed to turn the wheels and examples of both horizontally and vertically mounted wheels exist. The deep well at Greys Court (SO006) (Plate 3.2a) was operated by a vertical donkey-wheel, dating from the Tudor period and a similar wheel was constructed in Carisbrooke Castle, IoW, in 1588. The Carisbrooke well (IW001) was dug in the 12th century. Using prisoners to operate similar wheels was practiced at Oxford Prison (OX089) and in London at least until the 18th and 19th centuries (The Old Bailey Proceedings Online 2003).

As already discussed, lift pumps were used from the 15th century onward, although no surviving medieval pumps have been identified in Oxfordshire.

Conduits and pipework

Throughout the medieval period water was collected from wells and springs and carried along open channels, or leats, or through pipes to what were called conduits (Roberts, 2006, 26). The source of the water could be some distance from the conduit and changes in weather could have a marked impact on their efficiency. Conduits were essentially fountains, sometimes with a built-in storage tank, and conduit houses containing larger reservoirs were also constructed. The water from the conduits was intended for domestic consumption and conflicts arose between those who tried to use it for washing clothes, industry and watering animals. Conduits continued to supply towns for centuries.

The pipework was usually wood, mostly elm which does not rot when kept wet, up to the 18th century. Lead was also used as was earthenware, although it was only possible to

make short lengths in the early period and often these were in the form of channels not complete pipes (Barty-King 1992, 31-2). Generally all these pipes would have been difficult to join and seal, resulting in high wastage. Evidence for early pipework, and for brass taps, comes from archaeological excavations and from contemporary drawings and engravings (Magnusson 2001, 110-12). Lead pipework (WO191) was found in excavations at Eynsham Abbey c 1990 (Hardy et al. 2003, 509).

Water from the conduit was not always free. The Great Conduit in Chepe (LO020), London cost local residents 12/- (60p) for two years in the 14th century (Barty-King 1992, 26). The right to construct a 'quill', a private spur pipe from the main supply, could be bought and illegal quills were a persistent problem.

Religious houses

A good water supply was important to religious houses, particularly in urban settings, for flushing communal latrines and operating mills as well as drinking and washing. Monasteries were at the forefront of water technology in medieval Britain. Abingdon Abbey cut its mill stream, diverting water from the Thames, in c 960 (Bond 1989, 102). In the 12th century a conduit in Wytham (VW095) was held by the Godstow nuns and Osney Abbey had a conduit from a spring at North Hinksey (VW107), *Reve Mores Well* (Bond 1989, 86). In 1288 the Blackfriars also had a conduit (VW106) from Hinksey (VCH Berks IV, 405). All of these had to cross at least one branch of the Thames. Greyfriars Priory acquired its water from a spring at Headington (OX134), the pipes from which must have crossed the Blackfriars pipes from Hinksey, as Greyfriars was on the west (Bond 1993, 62). St John's Hospital, whose site is now occupied by Magdalen College, carried water along an aqueduct (OX120) from a spring called 'Crowell' (OX035). When excavations by Durham were carried out in 1987 a medieval building and culvert were discovered (Bond 1993, 64). John Steane has suggested, based on

parallels with an example in Bristol, that this was in fact the *mikveh* or ritual bath (OX057) of the Jews who were expelled in the late 13th century (Steane 1996, 263).

The elaborate systems developed by monasteries are clearly shown in surviving plans and architectural remains from the system used in Canterbury (Figure 3.14) by Christ Church Monastery and at St Augustine's Abbey (Barty-King 1992, 24-5).

Some of the monastic orders included townspeople in their water supply, either supplying them directly or by allowing the town to operate a spur. In the curtain wall of the now ruined 13th-century Bishop's Palace at Llandew, Brecon, is an unusual double-sided well (PO003), one side for the palace and the other for the villagers. The villagers continued to use this well until piped water arrived, with a pump installed in the 19th century (Vincent & Vincent, 2007). In London the Abbot of Westminster rented one conduit head (LO037) and its feeder springs to the city in 1439. There is no record of any of the religious groups in Oxford sharing their water supplies with the laity or that the systems survived the Dissolution. Indeed the Greyfriars were taking up their pipes in 1538 (Magnusson 2001, 163).

Urban areas

In urban areas streams became inadequate and by the medieval period more complex systems were in existence. A *ductus acquae* (OX091), presumably from the Thames, was known at Botley during the reign of William II, but it was destroyed by the men of Seacourt during Bishop Odo's rebellion (VCH Oxon IV, 398). Merton College was granted permission to pipe water from the Cherwell (OX123) in 1279 (Hibbert 1988, 492) and probably continued to do so into the post-medieval period.

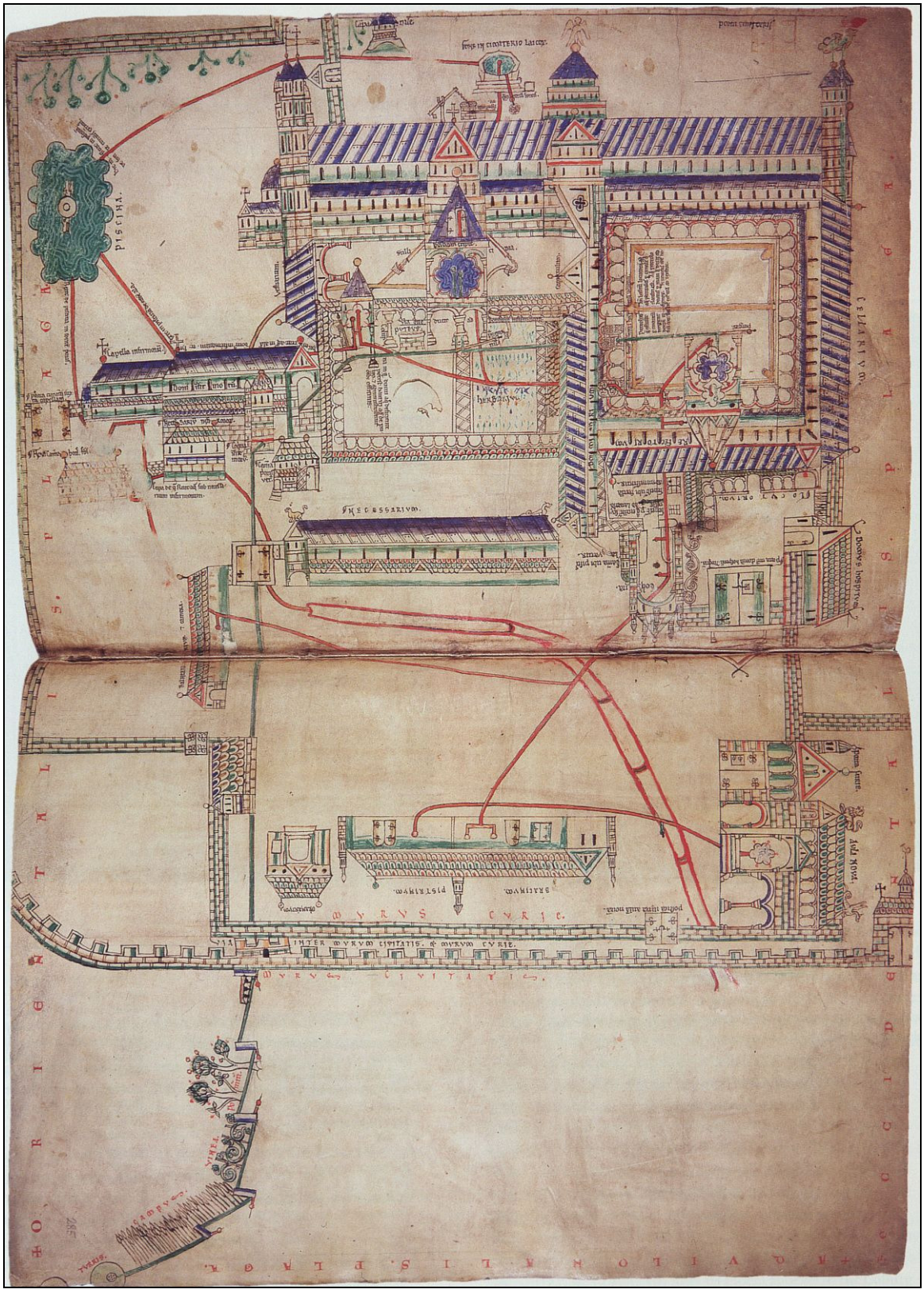


Figure 3.14: Monastic Water Supply, Canterbury

(from The Canterbury Psalter fols. 284v–285r)

The Carswell (VW002), which stood in Ock Street, Abingdon before 1245, was supplied by channelled streams which arose in the modern Albert Park. The supply was supplemented by construction of a Conduit House (VW001) (Plate 3.2b) containing a cistern which collected the stream water and then passed it to the well. The remains of stone lined channels (VW101) were found in the park north of the conduit house (Heritage Search). Although these stones appear to be 15th-century, possibly reused parts of the Abbey, the building is 16th century and was in existence by 1554. Both Conduit House and Carswell survive, the former in situ. In 1719 Richard Ely was given money to restore Carswell, which was moved from Ock Street into Conduit Road where a brick, semi-circular structure was set into the wall of Tomkins Almshouses (Baker 1963, 100-104).

Across the country many towns constructed conduits on the monastic model, including Bristol, Kings Lynn and Southampton (Magnusson 2001, 34). Some survive, like St Mary's Conduit in Lincoln (LI001). In towns monastic water systems were transferred to lay authorities after the Dissolution, for example in Gloucester where the town already shared the supply, but in 1542 obtained control of the whole (Barty-King 1992, 27).

Holy wells

During the medieval period many wells and springs were considered 'holy wells', usually because the water was believed to have healing properties. James Rattue (1990) published a list, derived from documentary sources, of 140 wells in Oxfordshire, mostly of medieval origin, many of which continued to be known and visited into the post-medieval period. This survey covered the immediately pre-1974 county and therefore does not include the area south of the Thames or St Anne's Well in Caversham (BE001)

(Plate 3.2c), which was first recorded in 1551-2 (Rattue 1995, 103). The best known is St Margaret's Well at Binsey (OX007), reputed to be good for eyes, also called the 'treacle well', a term often used in the past for wells with medicinal properties (Gardner 1960, 100). This one was in existence by c1170, demolished in 1637, but restored in 1874 (Hope 2004, 6-7). Until recently people from Leafield still visited the licorice wells (WO006, WO089) in Wychwood Forest on Palm Sunday to collect their water (Townsend undated) and similar ceremonies were associated with other sites. It is known that some of these wells were suppressed or at least stripped of ornament and ritual during the Reformation (Walsham 2011, 233). The origins of holy wells and their fates represent a complex issue (see Chapters 4 and 5).

3.3.5 The mid-16th century

Urban areas

Advances in water supply during the 16th century were limited. As discussed above, some urban areas were able to take over monastic systems after the Dissolution. The inadequacy of water supply in urban areas remained a problem. In Plymouth the need to supply ships with water led in the later 16th century to Elizabeth I granting the city, under the mayorship of Sir Francis Drake, the right to take water from the River Meavy. Drake's Leat (DV001) opened in 1591 and carried water 28 km along wide, shallow channels. With alterations the system continued to supply Plymouth for 300 years (Hawkings 1987).

A more innovative development was the installation of a water wheel below one of the arches of London Bridge to pump water from the bottom of the river, where it was supposedly fresher, to a conduit on the bank (Figure 3.15). The system (LO021), designed and built by a Dutchman, Peter Morice, came into operation in 1582, and in 1583 permission was granted for another arch to be similarly equipped. The wheel, which

used the ebb and flow of the tide, operated the pistons of two pumps rather than acting as the water conveying mechanism (Roberts 2006, 32-3). By 1593 a horse-operated bucket chain was also in use in London (LO038). The wheels were unpopular because of their noise and were seen as a threat by the Water Carriers' Guild (Barty-King 1992, 46-7).

Rural areas

Most of the rural population was able to obtain water from wells or natural sources, even if sometimes these were located some distance from home. For the big estates the position was similar, but some expensive improvements were introduced. The Tudor well at Greys Court (SO006) is some 61 m deep, a considerable feat at that period. The donkey-wheel to raise water from that depth dates to 1586-7 (Jones 2005, 5). In 1596 Sir John Harrington invented the water closet, installing one at his house in Keston, Somerset (SM003). When his godmother, Queen Elizabeth I, visited she tried the invention and had one built (LO022) at Richmond Palace (Barty-King 1992, 84). However, the device was not adopted until after its reinvention in the late 18th century.

One of the most elaborate systems, dating from the mid-16th century, was used to supply Hampton Court Palace with fresh water. Three conduit houses were constructed at Kingston on the opposite side of the River Thames and a pipeline from Combe Conduit (LO023) connected them to the palace (Forge 1959). At around the same date an artificial river, the Duke of Northumberland's River (LO024), was created as a tributary of the River Colne to supply mills and the estates at Syon Park (Barton 1962, 87).

3.3.6 The 17th century

Improvements to urban water supplies continued in the 17th century. The precise motivation for Otto Nicholson's proposals for piped water for Oxford is not clear, but perhaps he was inspired by his work with the New River Company in London (Clark

1997, 4). His system, based on the springs of North Hinksey (VW020), is discussed in more detail in Chapter 6. Although it operated for more than a century is was never popular, in part because of low output. In 1694 a wheel was installed at Folly Bridge (OX015), Oxford to augment the supply from Nicholson's conduit (Crawley 1947, 93-4). Oxford was not the only town in the county to gain a public water supply in the 17th century. The geology of the area meant that wells and pumps were able to supply Woodstock with sufficient water until the later 17th century. Piped water was under discussion from the beginning of that century when Alderman Metcalfe left £3 for the building of a conduit. The corporation took water supply seriously, rebuilding a public well and pump (WO198) in Oxford Street in 1631. Eventually in the 1690s pipes were laid down and a water wheel was installed on the Glyme by Old Woodstock Mill (WO173) to supply a cistern, which was originally to be sited in Market Place, combined with a market house on the site of the cross. In 1719 a new cistern (WO197) was built, closer to the pumping station at the junction of Hoggrove Hill and Harrison's Lane (VCH Oxon XI, 397-8). Abingdon Corporation had also improved its supply (see Chapter 6).

As ever, the supply to London was considered inadequate, particularly for those living in its northern parts. Schemes were devised to collect water from springs in Hertfordshire (HE002) and construct a channel to carry it to the city. In 1604 James I granted the patent to Edmund Colthurst to create the 'New River'. The enterprise proved more difficult and expensive than anticipated and was taken over by Hugh Myddleton. Problems persisted, but, due to the enthusiasm of the king for the project, by 1613 water from the Ware area was conveyed to a reservoir in Islington, the New River Head (LO025). From there water was distributed: through pipes to those who could afford the high charges or by the traditional water carriers to the less affluent (Halliday 2004, 8-14).

Belfast and Liverpool were supplied with spring water by the end of the 17th century, but

it was much more common for water to be pumped from rivers. Gloucester, York and Newcastle were among the cities supplied in this way (Barty-King 1992, 55-6). In London, the York Buildings Water Works (LO026), opened in 1676, was among several which used horse-driven treadmills to raise yet more water for London (Roberts 2006, 71). Morice's system (LO021) was lost in the Great Fire of London in 1666, but soon rebuilt. The need for a good water supply in case of fire was generally acknowledged, but rarely guaranteed.

Towards the end of the century an engineer, George Sorocold, constructed an engine to supply Derby with water (DE004), basing his design on one employed at Versailles to serve the palace and gardens. The supply was so successful that Sorocold was invited to carry out similar projects in Norwich, Leeds, Bristol and Sheffield among other towns. In 1696 the new owner of the leases of the London Bridge wheels commissioned him to rebuild the original works and install machinery in a third arch (Roberts 2006, 37). Sorocold's work was so successful that his engines (Figure 3.16) remained a major source of supply into the 19th century and Oxford's Folly Bridge plant (OX015) also employed his design.

The use of water for ornament and entertainment was widespread. Water technology was sufficiently advanced for various novelties to be introduced, including a water clock at Hanwell (CH256) described by Plot (1972, 241), who also described and drew 'Queen Henrietta's Waterworks' (WO042) (Plate 3.2d), constructed by Henry Bushell in 1636 using a spring at Enstone (see Chapter 5).

3.3.7 The 18th century

At the end of the 17th century and during the 18th, water supplies for the increasingly large and elaborate country mansions became an integral part of their design, both to

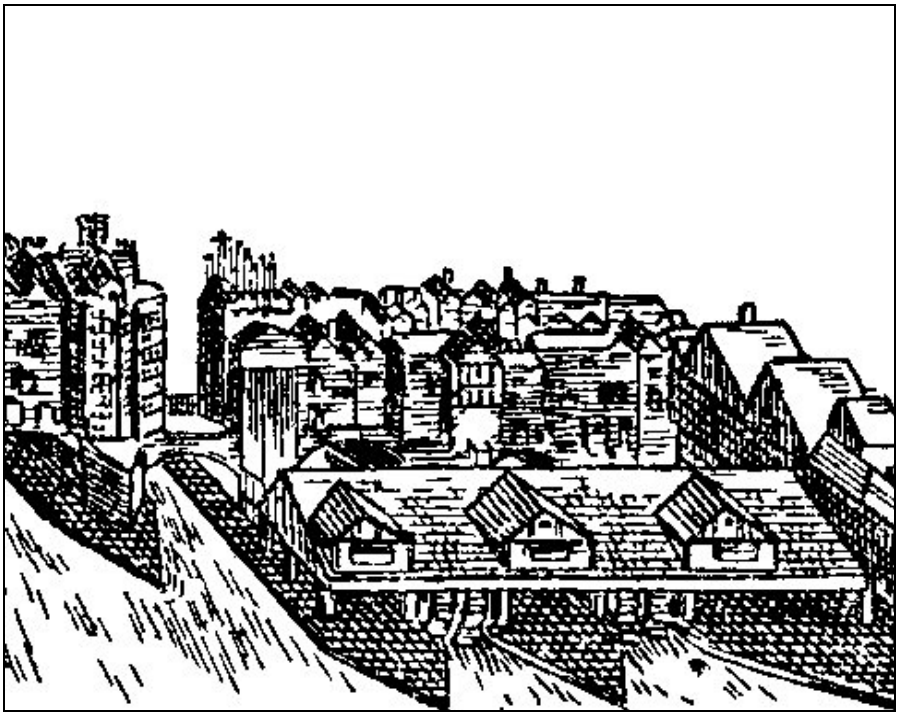


Figure 3.15: London Bridge with Morice's Water Wheel
(from Pepysia Library, Cambridge)

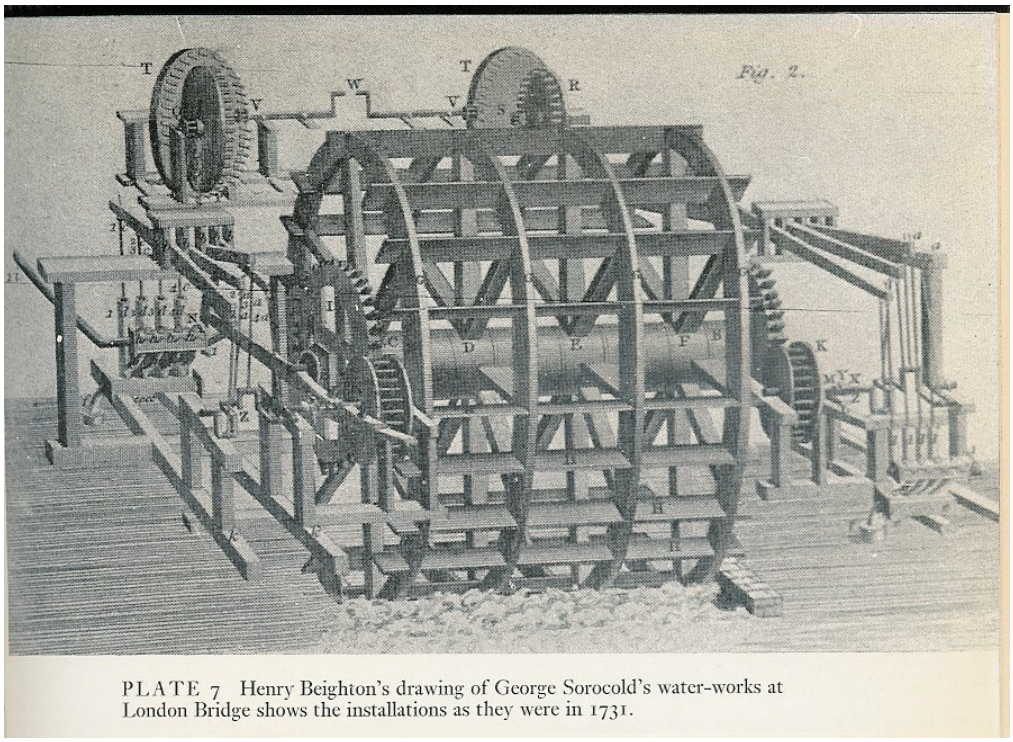


PLATE 7 Henry Beighton's drawing of George Sorocold's water-works at London Bridge shows the installations as they were in 1731.

Figure 3.16: Sorocold's Water Wheel (from Robins 1946)

supply the domestic needs of the inhabitants and to enhance the aesthetic appeal of their gardens, discussed below and in Chapter 5. By that time water pumps could be powered by steam as well as the traditional water-, horse- or donkey-wheels. The first successful steam pumps were designed by Thomas Savery, although Newcomen soon developed an improved version (Figure 3.17). These engines relied on the creation of a partial vacuum when steam condensed, against which atmospheric pressure created a force which operated the pump (Roberts 2006, 81-2) and were therefore often called 'atmospheric engines'.

Oxfordshire provides many good examples of these trends. Heythrop House was built for the 1st Duke of Shrewsbury before his death in 1718 by Thomas Archer on the River Glyme (WO058). Pumping houses (WO144-8) were erected on the river, linked by eight cascades and the 'Cascade Walk' (Garden History Society 1978). Elsewhere on the river bank is a bathhouse, demonstrating the new fashion for cold baths, which were taken for health. The first public cold baths had opened in Clerkenwell (LO030) in 1697 and Bath (SM002) in 1707 (Girouard 1978, 256) and one was opened in Watchfield, Oxfordshire (VW046) in the 1760s. Many estates had a bath, either in the open air or within a bath house (Rolf 2011).

The supply of water within the house itself was usually confined to the ground floor and basements, where indoor plunge baths were located, although there were exceptions, such as at Shaw House near Newbury, Berkshire (BE012). Elaborate pieces of furniture, "buffets", which contained water taps, basins and shelves for glassware, were feature in many dining-rooms (Girouard 1978, 251-6). On a number of estates water towers were built and there are surviving examples at Woodeaton Manor (SO001) and Bletchingdon Park (CH106) in Oxfordshire. However, the finest example is at Carshalton House, Surrey (SU001), which also housed a plunge bath (Rolf 2011, 22).

The process of creating extensive landscaped gardens sometimes involved the complete removal of villages, as happened at Nuneham Courtenay in 1760 (Batey 1968, 119). Such destruction and rebuilding of villages as part of the landscaping process was far from unusual (see Chapter 5). There were pattern books for these villages and Plaw's 'Ferme Ornée or Rural Improvements' of 1795 included pumps in its layouts (Darley 1978, 51).

The enclosure movement was of particular importance during the 18th and 19th centuries, influencing the extent of landowner control over parishes and the settlements within them (Emery 1974). As discussed in Chapters 4 and 5, this influence extended to water supply.

Although steam powered systems were becoming available and were used on large estates, they remained a rarity at the end of the 18th century and were mainly confined to providing supplies for the large towns. Savery's engines were used at Campden House (LO028) and Sion Hill (LO029) in London. John Smeaton designed one for the York Waterworks company (YO001) in 1784 and a Boulton & Watt engine was introduced in Hull (YO002) in 1795, replacing an 'atmospheric engine' of 1773. These engines used the expansion of the steam also and generated a force on both the up and down strokes (Figure 3.18) (Roberts 2006, 92-3).

Most new waterworks, whether for private estates or public supplies, were based on waterwheels. One (SX001) was installed at Coultershaw, Sussex in 1792 to supply Petworth House and the nearby town (Barty-King 1992,75-6). As water supplies to towns improved, they were used for fire-fighting as well as drinking water. The pipes across both London and Newcastle upon Tyne were equipped with 'fire plugs' at regular intervals to which hoses could be attached, although the supply was not always adequate particularly as in many places it was only switched on for restricted periods (ibid, 72-3).

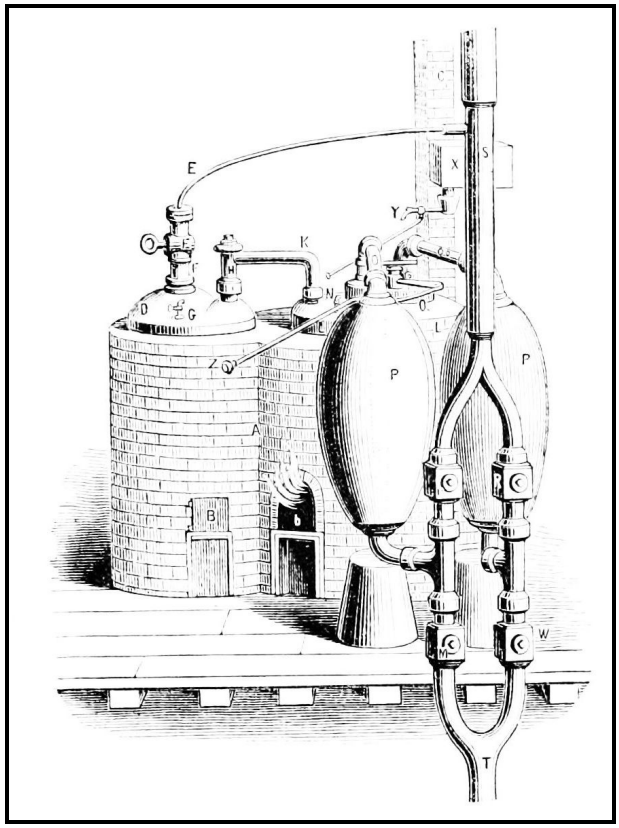


Figure 13.17: Savory Steam Engine (from Wikipedia Commons)

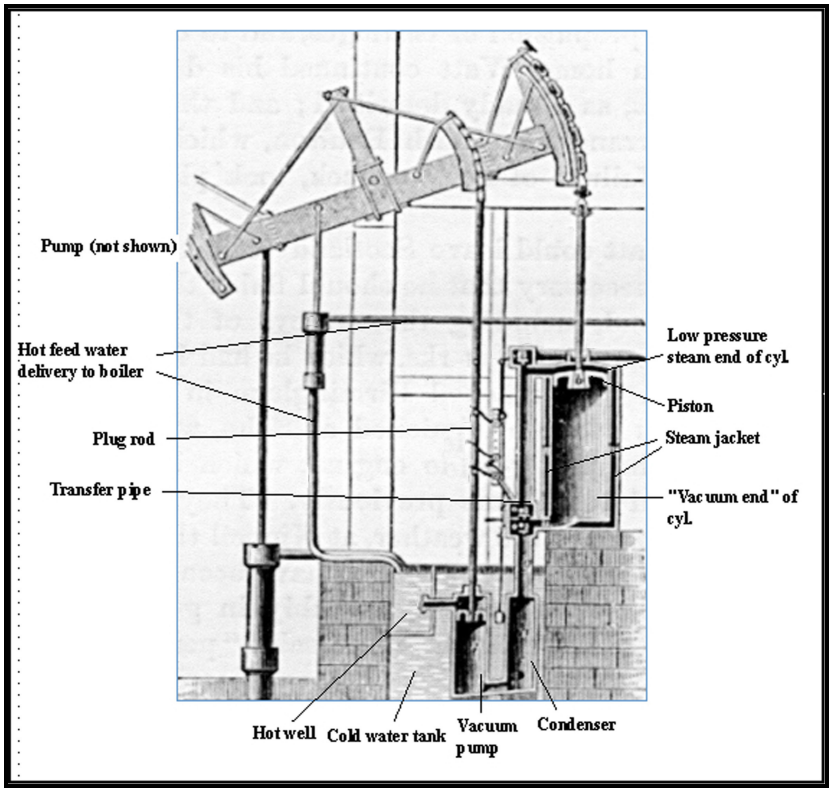


Figure 3.18: Watt Steam Engine (from Wikipedia Commons)

Before the end of the 18th century the perceived medicinal benefits of drinking mineral water, and the therapeutic effects of bathing, both in cold springs and the hot waters at Bath (SM001), had prompted the establishment of many spas (Havins 1976, 32-9). It was during that period that some obtained their place in the seasonal migrations of the social elite. Sea-bathing became fashionable after George III tried it at Weymouth in 1789 and his son, George IV, caused the metamorphosis of Brighthelmston from a small fishing village into Brighton (Rolf 2011, 38). Spas and water cures have continued in popularity, with support from the medical profession, although since World War II the trend has been towards the 'beauty' market and the National Health Service has ceased to fund or promote them (Sargeant 2008, 9).

3.3.8 Water and the law before the 19th century

The concept of access to water as a right was unknown in England until the 18th century, but issues relating to water were dealt with under the common law tradition. Water was seen in relation to property and land ownership, the laws for which were based on the provisions included in Magna Carta, the charter signed in 1215 (Finkelman 2010, 174). There had been some more specific legal protection in the *Lex Quincitia,* a Roman law code of *c* 9BC, which outlined the penalties for deliberate damage to features such as underground conduits and reservoirs (Getzler 2004, 42). One 13th-century legal commentator, Bracton, considered the right to draw water from a spring, well or pond as protected under the law (ibid, 75), but the emphasis was still on the rights of landowners to use water on their land as they wished.

Throughout the medieval and early post-medieval periods, riparian disputes were mainly concerned with the effects on the flow of water for fishing and transportation caused by diversion of streams to power mills and in the 18th century the growth in water-powered industrial processes added to the demand (Getzler 2004, 18-22). The Abbey Mill Stream,

Abingdon (VW103) is an example of such a diversion. Other causes of dispute were pollution of water resulting from industries such as dyeing and lack of water to irrigate fields.

In the later 18th century the construction of canals increased the amount of water removed from rivers. By the time the Victorian cities were constructing their large reservoirs, it had become normal for a large undertaking to guarantee their supply through a specific Act of Parliament, many of which were subject to legal challenge (Getzler 2004, 38-42).

3.3.9 The 19th century

Water quality

Although efforts to improve water supplies had been made from an early period, little had been done to provide for the disposal of waste, particularly sewage. Some local bye-laws and warnings were issued, instructing the populace to keep wells and springs clear of rubbish (VCH Oxon X, 82-3). Epidemics of typhoid, cholera and diarrhoea were common, including in Oxford (see Chapter 6). In the early years of the century various approaches were tried: Thomas Telford used a series of shallow reservoirs to act as settling tanks for the Glasgow supply in 1806, but this did not improve its purity. Sand filtration to remove the finer particles which would not settle out was introduced to the city by Richard Gillespie in 1808. Two more systems, combining sieves and sand filtration, were devised in the 1820s by Robert Thom at Greenock and James Simpson at Chelsea (Barty-King 1992, 89). Sand filtration gained widespread acceptance eventually and in some form is still part of the purification process.

Simpson's filtration systems relied on a series of layers, with fine sand at the top and gravels and stone of increasing size below. The water outlet was at the bottom. The sand gradually developed a film of micro-organisms which digested the biological waste

(Roberts 2006,139-40).

The link between disease and water purity, rather than air quality, took many years to gain acceptance. The main activists were, in Oxford, Henry Acland and, in London, Edwin Chadwick, William Farr and John Snow. The relationship between disease rates and different water supply companies led to the discovery that many people were drinking water collected downstream from the places where sewage entered the rivers (Acland 1856). Gradually the large companies moved their intakes further upstream (Roberts 2006, 170).

Snow's work also demonstrated that local wells were being contaminated by poor quality drains and leaking cess pits. Efforts to improve these conditions for ordinary working people became a crusade for Chadwick who published his *Report on the Sanitary Conditions of the Labouring Population* (Chadwick 1842).

The problem of sewage disposal had increased after the water closet, redesigned by Joseph Bramah, Thomas Crapper and others in the late 18th century, became widely adopted. The only feasible way to dispose of their output was discharge into rivers. In London the level of contamination reached such heights during 'The Great Stink' of 1858 that parts of the houses of Parliament became unusable because of the smell (Halliday 1999, 71).

National Legislation

Provision of water supply and public health had always been matters dealt with locally or by a Private Act of Parliament in the case of larger undertakings. During the 1840s more wide-reaching measures began to be introduced by parliament. The first was the Public Bath and Wash-Houses Act 1846, but the following year saw the first Waterworks Act

(Hassan 1998, 17). This was mainly aimed at standardising supply procedures across the country, replacing the previous system of private acts, but also placing an obligation on suppliers to ensure sufficient supply and maintain pipework to all their subscribers (*The Surveyor* 1947, 88). Another Waterworks Act was passed in 1863 raising supply standards. The 1870 and 1873 Gas and Waterworks Facilities Acts were concerned with construction and maintenance of plant (Hall 1989, 18).

A number of Public Health Acts also made provisions for water supplies. The 1848 Act gave the Central Board of Health the power to set up Local Health Boards if ratepayers wished or if the death rate exceeded a given level (Hall 1989, 17). These boards often controlled waterworks, although in Oxford trustees had that responsibility. An obligation to ensure adequate water supplies was imposed on Local Authorities in 1875 and three years later further powers over water supplies and provisions for rural supplies were made (Hassan 1998, 18).

The effects of uncontrolled sewage disposal were acknowledged by the Rivers Pollution Prevention Act 1876, which placed an absolute prohibition on allowing polluting discharges to enter watercourses (Hassan 1998, 23). The battle however is still being fought (one concern today is nitrate run-off from fertilisers), but construction of proper sewage treatment plants in the late 19th century produced immense improvements in the quality of water in streams, wells and piped water. The Oxford plant (OX087) opened between Sandford and Littlemore in 1873 (Fasnacht 1954, 199), six years after the Banbury works (CH251) (Stevenson 1977, 93).

Meanwhile the Metropolis Local Management Amendment Act 1858 enabled the severe, long-standing problems of the capital to be solved by Bazalgette. His system of intercepting sewers still emptied into the River Thames, but far downstream from the

then populated areas, at Beckton on the Essex side and Crossness on the south bank. Initially the raw sewage was directly discharged, but later treatment plants were constructed and the residual sludge was then taken out to sea and dumped. This method of disposal only ceased in 1998 (Halliday 1999, 106) when incineration was adopted.

Another piece of legislation was the Local Government Act 1888, which created County Councils. However, they had no jurisdiction over water supply until the 1926 Local Government Act allowed costs to be spread among local authorities which made it easier for a wider provision of utilities to be implemented (Hassan 1998, 58).

Later post-medieval waterworks

During the 19th century waterworks were constructed to supply many Oxfordshire towns (see Chapter 6). Some were operated by turbine pumps, such as those in Woodstock (WO007) (VCH Oxon XII, 397-8) and Burford (WO185) (Kelly's Directory 1907). The larger plants, at Banbury (CH014) (VCH Oxon X 1972, 83) and Henley (SO088) (Kelly's Directory 1907) for example, were powered by steam engines.

The River Thames had sufficient capacity for its water to supply the towns along its length, in Oxfordshire and eastwards including in large part London. Upstream from the capital, around Hampton (LO032), Kempton (LO033) and Staines, large waterworks and reservoir systems, equipped with the latest steam pumping engines, were installed in the later 19th century. However, many of the large towns elsewhere in the country were forced to obtain their supplies from much further afield. Lake Vrnwy, Powys (PO001) was constructed in 1891-2 to supply Liverpool and in the same county the Elan Valley (PO002) contains 5 reservoirs supplying Birmingham (Naylor 2005).

Smaller water schemes

The hydraulic ram (Figure 3.19) was invented in 1793 by the Montgolfier brothers and is a pump powered by flowing water and, with no external power source, can raise water as much as 60 m (Milln 1995, 1). This mechanism was used to supply numerous villages and rural areas, including Ashbury (VH012) and Tackley (WO003) (see Chapter 5).

As well as the model villages built by the great estates there were occasional attempts by social activists during the 19th century to create a more rural alternative to urban life. The Chartist Land Company founded Charterville in 1847-8 close to Minster Lovell, Oxfordshire. Each of the 90 homes was surrounded by its own farm plot and, while these smallholdings were not successful (Hadfield 1970, Tiller 1985), the plans show that water supply (WO194) was included in the planning.

Another influence on water supply in the 19th century was the evangelical movement, which led some of the more socially advantaged to try to improve the lot of the lower classes. Chadwick was part of this movement, which also included people like Baroness Burdett Coutts who funded urban housing initiatives, in her case Columbia Square (LO010) (Healy 1978, 125).

Public wells and pumps were common features in the villages, many erected by gift of a local resident. In south-east Oxfordshire, a large number used machinery cast by Wilder's of Wallingford, who patented a clip pulley and wire rope system for wells, which prevented slippage (Plate 3.3a) (Dewey & Dewey1983, 21). Mass production techniques for ironwork made pumps and wells much cheaper and some designs, such as the lion-head hydrant manufactured by Glenfield & Kennedy, are found across the whole county (see Chapter 4). Some of the designs were particularly distinctive, such as iron troughs standing on legs in the shape of a shire horse's hoof were made by Macfarlane & Co in

Glasgow, although none have been recorded in Oxfordshire. The troughs came in different sizes, with four (TY001) or six (BE013) legs (Newcastle Evening Chronicle 1974, EH Viewfinder).

Benefactors were also erecting ornamental memorial fountains, for example at Charlbury (WO001) where John Kibble's 1897 fountain is a joint commemoration of the arrival of piped water to the village and Queen Victoria's Diamond Jubilee (Stevenson 1977, 103). The Metropolitan Free Drinking Fountain Association was founded in 1859 to promote pure water supplies and temperance, since beer was often safer to drink at the time (Drinking Fountain Association 1995). Troughs funded by that organisation survive in several locations across Oxfordshire including in Banbury (CH025) (Plate 3.3b).

3.3.10 After 1900

Water supply

Despite the initiatives described, the principal source of water for most of the population of Oxfordshire remained the village/private well or pump, a standpipe in the street or even the nearby stream until well into the 20th century (OFWI 1999). Some properties still obtain their water from wells or springs, but this is now a matter of preference rather than necessity. Where earlier features survive they often provide a fall-back in case of drought.

Although 19th century legislation, the Public Health Acts of 1875 and 1878 in particular, had granted powers over water supply to local authorities, and obliged them to ensure the supply was adequate (Barty-King 1992, 138), in the early 20th century provision of water to homes and businesses was dependent on a mixture of local authorities, private companies and private individuals.

In 1914 there were 2,160 different suppliers across England and Wales (Hall 1989, 19). In many cases the establishment of a supply was linked to an Act of Parliament which provided guarantees of a monopoly and stronger land rights. These 'Statutory Water Companies' included both private and municipal undertakings (ibid, 18). As the population increased the number of suppliers also rose.

In 1902 the Thame Waterworks (SO018) opened, extracting its water from a borehole on Thame's outskirts at Kingsey from where it was pumped to a water tower in the town (Brown & Guest 1935, 248-9). This was an Urban District Council undertaking, as was the ill-fated Witney Water Tower (WO062) constructed in 1903, which burst twice (Scott ROW 14).

During the earlier part of the 20th century water consumption per head began to increase considerably, reaching the order of 150-200 litres per head per day (lhd) by World War II, driven by the installation of WCs and baths particularly in new houses (Hassan 1998 53-4). The construction of subsidised council housing in the inter-war period was governed by regulations and guidance, which insisted on certain minimum sanitary conditions. However, the subsidies paid for house building did not allow for construction of necessary infrastructure such as mains water supplies particularly in rural areas. In addition there was little improvement in facilities in the existing housing stock, with around half in larger urban areas only having a cold water tap and a WC by 1946 (ibid, 55).

In many rural areas consumption remained as low as 25 lhd. Large numbers of houses remained without running water and a report to the Ministry of Health in 1929 suggested that it would be impractical to install a universal piped supply (Hassan 1998, 58). When council houses were built in Kidlington in 1921 a new well (CH165) (Plate 3.3c) was dug

to supply them (Oxfordshire Federation of Women's Institutes 1994, 11). Obviously when water had to be obtained from standpipes or wells, often some distance from the home, its use was confined to the strictly necessary. In 1944 the Rural Water Supplies and Sewage Act provided government subsidies for installation of piped water. The 30% of rural areas without piped water in 1945 fell to 10-21% by 1957 and to 3% by 1970 (Hassan 1998 , 58). This change had a major impact across the region. In the Chilterns area even the deep wells sunk during the later 19th century were unable to guarantee supply during periods of heat and shortage of rainfall (Kift 1999, 37).

The purity of piped water could be taken for granted through widespread adoption of filtration and from the 1920s the addition of chlorine. By the 1930s the four-stage process for water purification (Figure 3.20) had become the norm for all large water suppliers (Naylor 2005, 27-9) and only a few incidents of typhoid and other bacterial infections still occurred, sometimes linked to polluted wells (Chapman Davies 2008, 91).

There was also a difference between the cost of domestic water supplies in rural and urban areas. In the larger urban areas supplies to the poor were provided at a loss and local government regularly subsidised water services through the rates. As early as the 1930s a national grid for water was proposed, but was rejected by the water industry (Barry-King 1992, 153). The Government hoped that Joint Water Boards (JWBs) for large areas, established from the 1920s onwards would result in fairer supplies, but without any powers of compulsion the JWBs had difficulty persuading individual undertakers to combine (ibid, 157-8).

The problem of water supply was addressed in the Water Act 1945, which provided for more government control and encouraged suppliers to combine (Barty-King 1992, 158). By 1963 the need for rationalisation and the competing demands from industry led to the

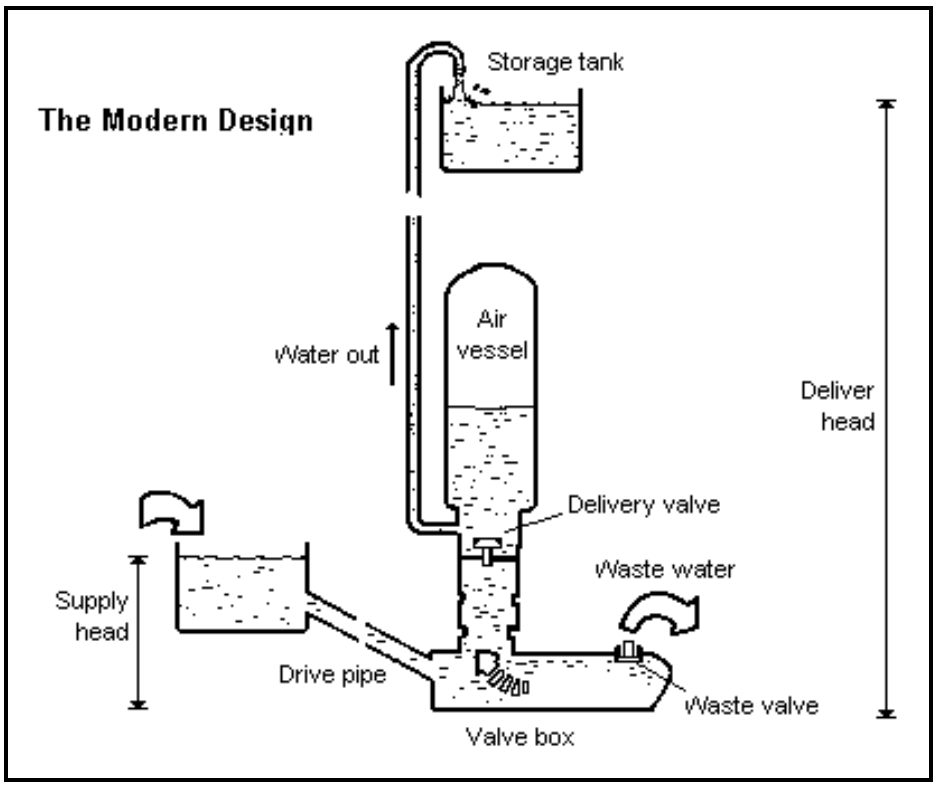


Figure 13.19: Hydraulic Ram (from www.cat.org.uk)

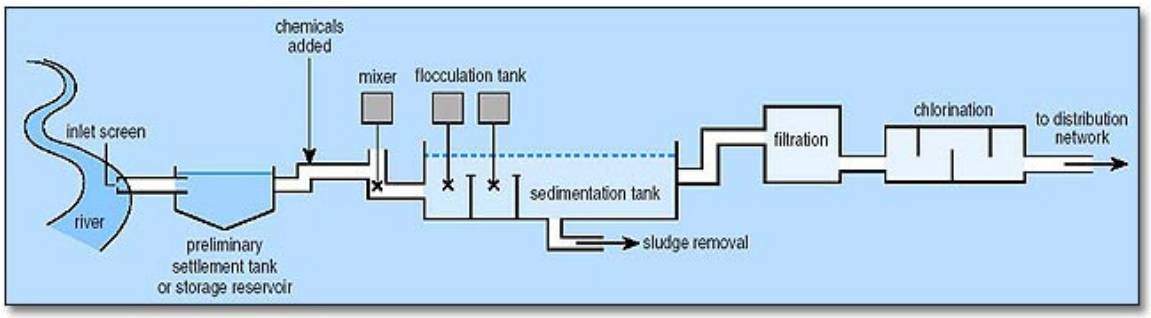


Figure 3.20: Stages of Water Purification

(OpenLearn LabSpace, Creative Commons)

creation of 29 river authorities and a Water Resources Board, without the power to enforce changes. The Water Act 1973 led to the creation of ten regional Water Authorities which took over all responsibility for water supply apart from areas served by 29 surviving Statutory Water Companies, which had been set up by separate Acts of Parliament (ibid, 166). These ten were privatised in 1989 (ibid, 176). The non-tidal Thames area falls within the Thames Water plc area within which six Statutory Companies then survived. Some parts of the region, in eastern Buckinghamshire, north Surrey and the western fringe of London are still supplied by Three Valleys Water plc. This company obtains most of its water from chalk aquifers (Hall 1989, 187-98) .

Thames Water took over the facilities of the Oxford and District Water Board, which had covered the whole of Oxfordshire (VCH Oxon IV 1971), and had already begun improving supply. A huge reservoir was constructed at Farmoor (VW030) (Plate 3.3d) in 1967 with adjoining treatment works, replacing many of the smaller facilities. The second phase at Farmoor now supplies Swindon (Vick 2008).

Excavations prior to construction of the reservoir provided opportunities to investigate the prehistoric archaeology of the Thames Valley (Lambrick & Robinson,1979, 1). Some of the earlier plants have been retained to house pumping stations, such as the Wantage site (VW006), while others such as Thame (SO018) were sold or demolished. Of the urban water towers, three remain: at Neithrop (CH103), Wallingford (SO094) and Chipping Norton (WO125).

Apart from the River Thames several boreholes are still used by Thames Water across Oxfordshire (Sustainable Blewbury 2013). In the Reading area, mains water is extracted from the River Kennet, although licences have been granted to organisations such as West Berkshire Health Authority, Scottish Courage Brewery and Reading Football Club

for extraction from underground sources (Reading BC, 51). There will be similar abstraction licences for large organisations in Oxfordshire, but the information was not available.

Sewage treatment

Progress in sewage treatment was much slower and met with rather more opposition. The details of processing are not part of this study, but improvements in water supply to homes influenced the need for sewage to be treated. Until the introduction of water closets, waste was disposed of in cess pits, carted away by the night soil man or emptied into gutters to be washed into the nearest running river or stream (Eveleigh 2010, 12-3). None of these methods is damaging on a small scale, but there are problems with bulk and dumping into rivers needs careful planning in relation to intake points. WCs increased the amount of sewage entering rivers and by the end of the 19th century alternative approaches were being tried for urban areas (Halliday 1999,43). Sewage was piped to a collecting point where it was treated and then the less harmful residue was disposed of. In Wallingford the sewage was actually pumped to the sewage works (Dewey et al. 1989).

3.3.11 Non-domestic uses

Although provision of water for drinking, washing and cooking is the primary aim of water supplies, there are other important uses (see Chapter 6). In 1774 a large reservoir was constructed at Clattercote (CH004) near Banbury to help maintain the water level in the newly constructed Oxford Canal and when the canal was extended to Oxford itself in the 1780s the reservoir was enlarged (Compton 1976, 25). The railways also required water for steam engines and two water towers survive at the Railway Centre in Didcot (SO162, SO177). Many of the airfields constructed across Oxfordshire in the two World Wars were equipped with water towers, mainly as a fire precaution. At Berinsfield the

tower (SO084) is now used by Thames Water.

Water was used in large quantities in many industries including brewing. Breweries generally have their own water sources, a well at Hook Norton (CH176) for example. The Oxford University Press attempted unsuccessfully to sink a borehole to supply its steam printing equipment, but was forced to use the mains supply (OX028).

Washing and swimming also need a good supply of water. An Association for the Establishment of Baths and Washhouses for the Labouring Poor was established in 1844, which led to Sir Henry Dukinfield's Public Bath and Wash House Bill two years later (Gibson 1954, 396). Several public baths were opened in Oxford, the one in Bath Street (OX008), St Clements in 1827, well before the legislation (Hibbert 1977, 386). The city had a number of other public baths, several of which were used into the 1960s, in Jericho (OX084) for example and a number of Turkish Baths operated in the 19th century (Victorian Turkish Baths web site). The first public swimming bath in the county, in Banbury (CH231), was in use between 1855 and 1861 (VCH Oxon X, 87). There were also several designated bathing places on the rivers, such as Parsons Pleasure on the river Cherwell (OX102) and Witney bathers were even provided with huts (WO196) (Worley 1981, 152-3).

3.4 Summary

The availability of water depends to a large extent on geology. In the north of Oxfordshire limestone, which allows ready access to water, predominates, but in the south the impermeable chalk severely limits access. Early settlement patterns show that water supply was an important factor in the selection of a site, with rivers and streams particular foci. The association of settlement and water also emerges from place-names.

Human management of water began in the prehistoric period with wells and waterholes. Over time the mechanisms employed have increased in complexity. Advances in technology, moving from human and animal power to the use of steam, petrol and electricity for pumping have allowed large amounts of water to be transported long distances and provided in unlimited quantities to individual homes.

In the UK this situation is now taken for granted, but until the later 20th century provision differed between different social groups. Water has generally been easier to obtain for the upper social classes, although even in large country houses provision of running water above the ground floor was often limited. A sharper distinction existed between conditions in urban and rural areas. While a municipal water supply existed in some towns from the medieval period and had become the norm by the early 20th century, working-class homes in the country continued to be built without a mains supply until after World War II in some areas. Some families had to transport water several miles.

Water has always been used as a source of power, in relation to health and as part of decorative landscapes. As water became more readily available its non-domestic usage increased, with swimming pools becoming popular leisure facilities for example.

Responsibility for the provision of water also shifted during the post-medieval period. Legislation, relating to public health and changes to the structure of local government for example, have gradually replaced the role of individuals, particular social groups and private landowners in water supply by the control of centralised, commercial organisations.

4 OXFORDSHIRE RESOURCE

4.1 Oxfordshire

4.1.1 Administrative boundaries

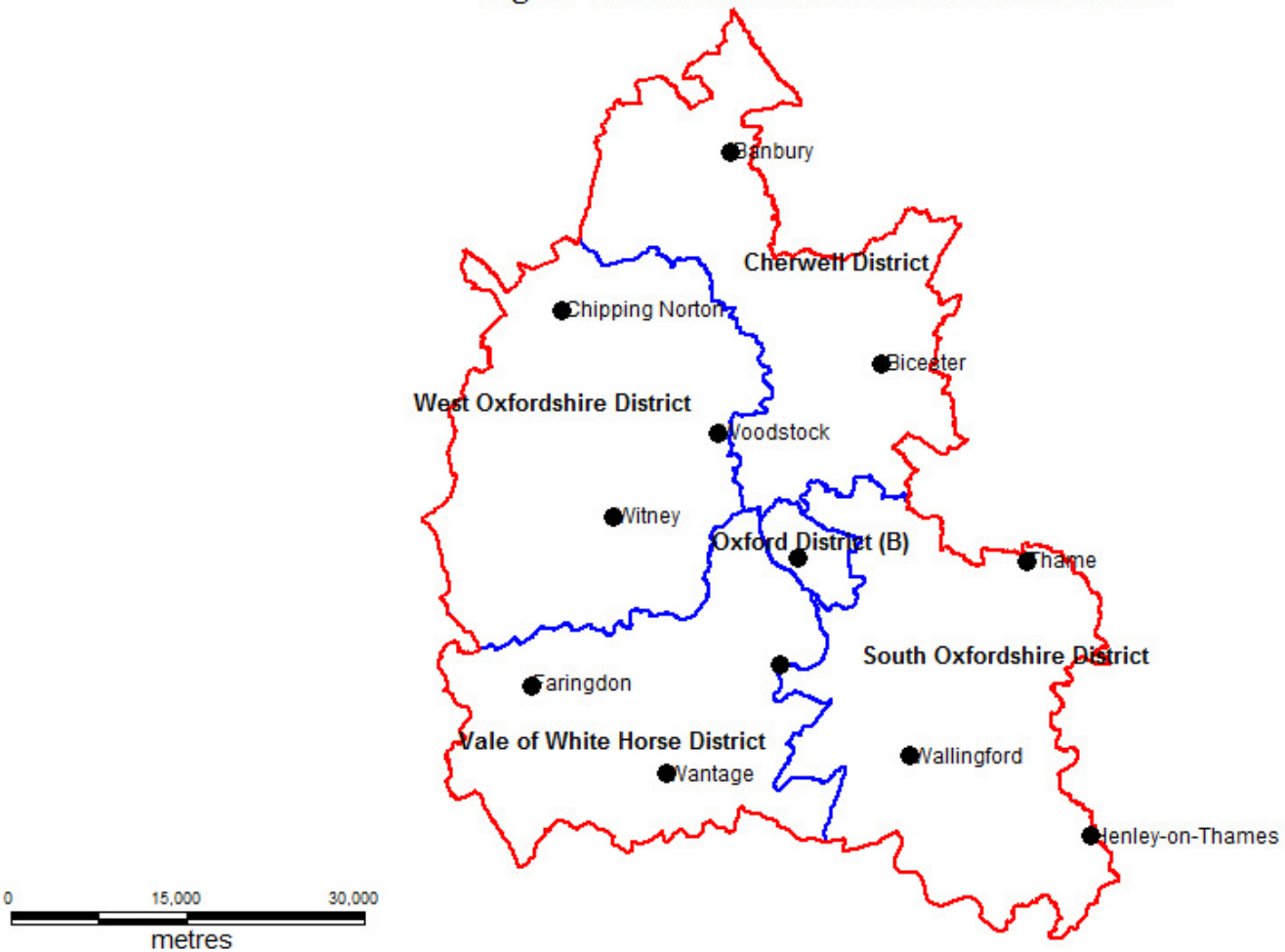
Until 1974, Oxfordshire lay almost entirely to the north the River Thames. The boundaries have experienced a number of changes since the mid-19th century, detailed in the *Guide to the Local Administrative Units of England* (Young 1979). The county has gained land from Berkshire, Buckinghamshire, and other adjoining counties when detached portions of counties generally were eradicated. In 1894 the parishes of Stokenchurch and Kingsey were gained from Buckinghamshire, then in 1933 Kingsey was handed back in exchange for the parish of Towersey. Caversham, now a northern suburb of Reading, became part of Berkshire in 1911. The county boundary slowly crept southwards along Abingdon Road out of Oxford as the city expanded across the river, but the biggest change came in 1974 when most of the northern part of Berkshire was transferred to Oxfordshire, since when there have been only minor changes to the boundary, mainly around Reading. (Figure 4.1)

Oxfordshire is now divided into five districts: Cherwell, Oxford City, South Oxfordshire, Vale of White Horse and West Oxfordshire. The Vale of White area was all in Berkshire until 1974, together with parts of South Oxfordshire, including Wallingford. As stated in Chapter 6, there are few towns of any significant size in Oxfordshire; even Oxford has fewer than 200,000 people.

4.1.2 Origins of Parishes

Within the five Districts there are 317 parishes and the non-parish area of Oxford City.

Figure 4.1: Administrative Areas of Oxfordshire



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The parish system of administration has its origins in the late Anglo-Saxon and medieval periods, although it has been argued that some parish boundaries originated from prehistoric or Roman field systems (Hooke 1998, 65). The Anglo-Saxon settlement pattern probably consisted of scattered farmsteads, but by the Norman Conquest nucleation and formation of large arable fields were under way in many areas. Land was increasingly held by the church or lay lords, but parishes operated at a local level, bringing together communities often consisting of several townships. The size and organization of parishes provided a convenient unit for taxation purposes. It also usually ensured that the inhabitants had access to arable land, pasture, meadow and timber for fuel and construction. This pattern is visible in the Vale of White Horse, where the parishes are long and narrow, stretching across the chalk ridge down to the river valley (Hooke 1998, 74).

Increasing nucleation has been attributed to more than one cause. Population may have grown, increasing the need for arable fields and putting pressure on pasture. The balance between the different agricultural regimes might have been easier to manage on a communal basis. Another driver may have been increasing control by landowners over their land and its population. Nucleation was less common in pastoral areas, where the land was unsuitable for extensive arable farming and it brought little advantage (Hooke 1998, 129). Current opinion suggests that the pattern developed in two phases in the eighth to tenth centuries and also that local communities shaped the changes (Rippon 2008, 269).

The Domesday survey suggests a high degree of nucleation, but it focused on taxable estates and did not always list the various dependent villages, hamlets and isolated farmsteads (Rowley 1978, 106). However, the process continued in the medieval period, accompanied by the development of communal open fields around the settlement.

Although there were local variations in settlement patterns, factors such as soil quality, geology and topography produced a broad division across England between the open field system, spread across the middle of the country and including much of Oxfordshire, and more pastoral or woodland areas. Some of the latter can be found in the north-west and southern parts of the Oxfordshire. Various terms have been applied to describe this division including planned/ancient and champion/woodland (Williamson 2003, 5).

Demand for arable land and the economic viability of different forms of agriculture have always fluctuated. Additional agricultural land, sometimes short-lived, was created during the medieval period by piecemeal clearance of woodland (assarting), or use of wasteland. A lack of demand for cereal crops, caused by a population drop following the Black Death for example, led landowners to convert fields for other purposes such as deer parks, pasture or planted woodland (Jones and Page 2006, 201-3). Until the 16th century wool prices were much higher than those for arable crops. This enclosure process, usually by agreement with those affected, often resulted in the decline of villages whose populations no longer had employment on the land.

The move away from open fields continued throughout the post-medieval period. Enclosure in the 18th and 19th centuries was usually carried out by an Act of Parliament, and extended to common lands and wastes. The champion lands of the Midland region in particular developed their pattern of regularly-shaped fields served by new isolated farms. Developments in agricultural technology, mechanisation and creation of large landscape parks reduced the number of workers required, although agricultural labour remained the largest employment class in England until 1851 (Rowley 1978, 129).

In contrast to the close relationship between the manorial lord and his villagers, large landowners in the post-medieval period increasingly resided in new houses, set in large

parks well away from the villages. In many cases the village was rebuilt in a different location, and numerous examples of this can be seen in Oxfordshire including Nuneham Courtenay, Great Tew and Middleton Stoney (Rowley 1978, 130-7). The new villages contained sufficient accommodation for the required workforce, leaving other former residents to move to other villages or towns, such as Stonesfield, where other types of work might be obtained without tied housing. Some of the homeless constructed homes on the edge of the common land, where some new hamlets developed, such as Juniper Hill (Rowley 1978, 149).

Reluctance of landowners to house those they could not employ originated in part in the Act for the Relief of the Poor of 1601, which placed responsibility for relief on the parish (Briggs 1983, 114). Restricting the population in this way limited the number of the sick and indigent requiring support, thus keeping the poor rate as low as possible. However, the 1834 Poor Law Act and its successors, which led to concentration of relief through the workhouse system (Briggs 1983, 283) and shifted the burden from the parish, did not reduce the influence of large landowners. They still exercised control over other areas of life beyond housing, including religious affiliation and water supply.

The parishes under the control of a single or limited number of landowners developed a character different from those with multiple ownership, small farmers and mixed employment. They came to be known as ‘closed’ and ‘open’ parishes respectively. Table 4.1 summarises the difference between them.

Open Parish	Closed Parish
Large population	Small population
High population density	Low population density
Rapid population rise c 1851	Slow population increase
Many small proprietors	Large estates
Peasant families	Gentlemen's residences
Small farms	Large farms
High poor rates	Low poor rates
Rural industries and craftsmen	Little industry and few craftsmen
Shops and public houses plentiful	Few houses and public houses
Housing poor, but plentiful	Housing good, but in short supply
Nonconformism common	Strong Anglican control
Radicalism and independence strong in political and social organizations	Deference strong in politics and social organizations
Poachers	Gamekeepers

From: Mills 1980, 117

Table 4.1: Comparison of Open and Closed Parishes

Although closed parishes tend to be more common in former champion areas, their distribution is much more complex. They do exist in the woodland areas, such as Chinnor on the Chiltern ridge. If parishes contain more than one settlement, possibly a closed village and one or more open hamlets, they are classed as 'intermediate'.

A classification and mapping of parishes in Oxfordshire has been published (Byung Khun Song 2002, 209), and the typology proved useful for studying rural societies. This study of the historic, pre-1974, parishes of Oxfordshire divided them into 5 categories – strong and weak open, strong and weak closed and intermediate. No similar study has been identified for Berkshire and the parishes which were transferred to Oxfordshire. However, it is possible to make an assessment based on available documentation, such as patterns of enclosure (Wordie 1996; Dils 1998). For this study the 2002 classification has been used for descriptions of Oxfordshire parishes without the subdivision into 'strong' and 'weak', and a corresponding three-fold division has been made for the Berkshire

parishes.

The relationship between parish type and water supply is discussed in Section 4.4.2 and in Chapter 5. The breakdown of Oxfordshire's parishes into the categories outlined above is given in Table 4.2 and mapped in Figure 4.2. Oxford City is included as an open parish, this being the best description of its administrative status.

Type of Parish	Cherwell	Oxford City	South Oxford-shire	Vale of White Horse	West Oxford-shire	Total Parishes
Open	10	3	22	30	6	71
Closed	39	0	34	28	47	148
Intermediate	29	2	30	10	28	99

Table 4.2: Parish Types in Oxfordshire

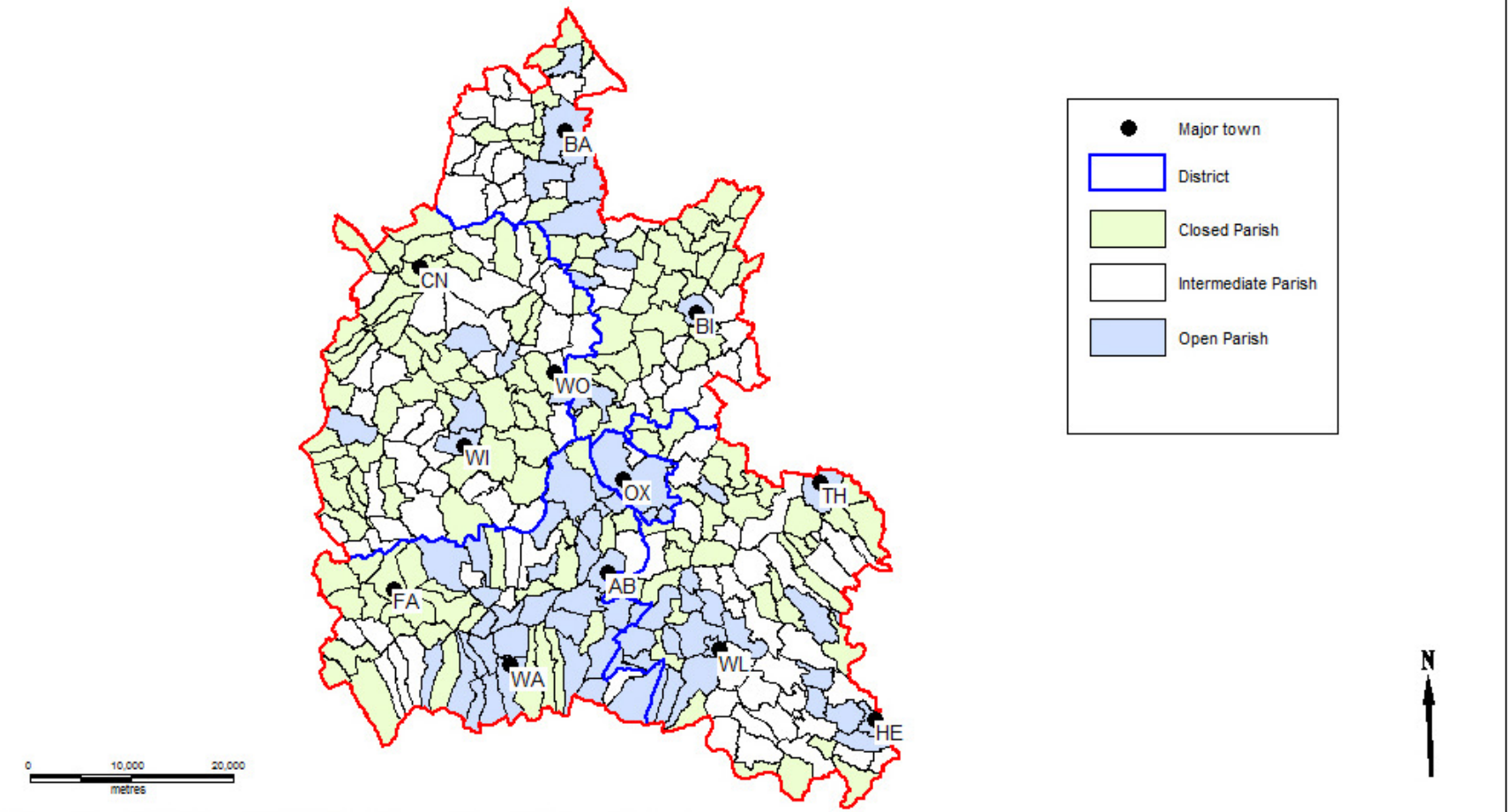
The distribution shows that apart from Oxford City and Vale of White Horse there are more closed than open parishes. The categorisation for the Vale of White Horse, formerly part of Berkshire, has a different basis from the other Districts and it is possible that the less rigorous methodology, discussed in Chapter 5, is less reliable. However, the very low number of open parishes in West Oxfordshire is striking and relates to the landscape of that part of the county. This is discussed in more detail later in this chapter.

4.1.3 Modern Landscape and Settlement Patterns

The geology of Oxfordshire and how this influences natural water resources has been discussed in Section 3.1. River valleys, mainly associated with the Thames and its tributaries dominate the area. These valleys are interspersed with the broadly west - east trending uplands of the Cotswolds, the Corallian Ridge, the Berkshire Downs and Chilterns. There is no land within the county above 300m and most lies below 100m.

Geological variation has also led to the recognition of distinct Landscape Character

Figure 4.2: Types of Parish



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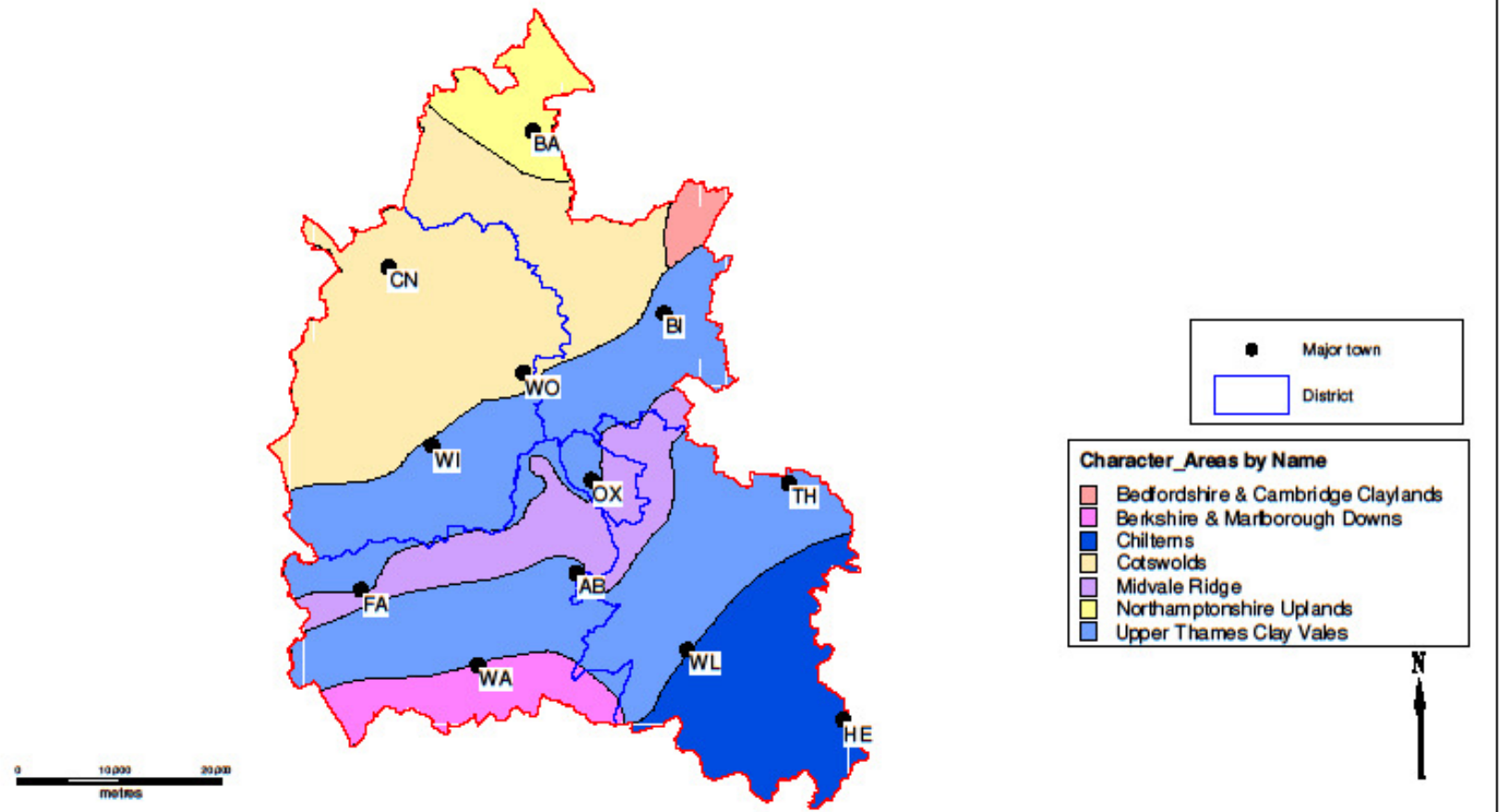
Areas, shown on Figure 4.3. These Character Areas were mapped by what is now Natural England in 1996; parts of seven of the 159 Countryside Character Areas defined across England are represented in Oxfordshire. In the higher areas in the north are the Northamptonshire Uplands and the Cotswolds, with the area around Finmere in the north-east just extending into the Bedfordshire and Cambridgeshire Claylands. Moving southwards the Upper Thames Clay Vales stretch across the county with the Midvale ridge in their centre. The southern extreme of the western side of the county lies within the Berkshire and Marlborough Downs, while the south-east is in the Chilterns area (Countryside Agency 1999).

These character areas closely follow the pattern of historic settlement areas defined by Roberts and Wrathmell (2000). The county lies mainly within the Central Province, with primarily nucleated settlement, with the south-east and southern part of its west side in the South Eastern Province, where dispersed settlement is more common. Within the Central Province the western portion is in the Cotswold Scarp and Vale Sub-province and the rest the Inner Midlands Sub-province. The downlands of the south-west lie within the East Wessex Sub-province of the South Eastern Province and the Chilterns in the south-east within the Thames Sub-province.

Both the Natural England and the Roberts and Wrathmell approaches to landscape characterisation arrive at similar conclusions about the considerable variation in patterns of settlement across the county, linking it to differences in geology, topography and landscape.

Oxfordshire maintained large areas of unenclosed land up to the late 18th century (Emery 1974). Enclosure was a gradual process in the south, formerly Berkshire (Wordie 1984). The traditional pattern of sheep grazing on the open downland declined and more arable

Figure 4.3: Landscape Character Areas



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production was introduced. The central and northern parts were enclosed more rapidly, mostly within the 18th century, creating the large arable fields of the clay vales and midvale ridge. Nucleated settlements are the norm across the county, apart from the Chilterns where there is more dispersed settlement, while in the Cotswolds the pattern is a little more mixed. Settlement is generally to be found in dry valley bottoms and the shallow sides of valleys particularly along the spring lines at the edges of the chalk and limestone. The high ground near gravel terraces also attracted settlement.

The different locations carry significant implications for availability and management of water supply.

4.2 Detailed Methodology

The methodology employed for this study and the structure of the database in which sites have been recorded were described in Chapter 1. However, the precise way in which these approaches have been used to identify sites within Oxfordshire requires further explanation. The basis for the catalogue was developed in 1999-2000 (Hind 2000), and this has been expanded from 213 entries to 910.

4.2.1 Designated sites

The availability online of the *National Heritage List* and *Images of England* facilitated the identification of Scheduled Monuments and Listed Buildings related to water supply. Additional sites were added, some of which had been missed in earlier searches, and others, for example some private facilities and several linked to gardens, which were not considered relevant earlier. The descriptions of Registered Parks and Gardens were helpful in this.

Some additional information was also obtained about sites on the EHA, using the

Pastscape website, but the earlier EHA search proved effective.

The Oxfordshire HER is now accessible through the website *Heritage Search,* where a search identified a number of additional sites and more details of others. In addition, HER Officer, Susan Lisk, contacted the author with information about several sites whose details had been uncovered among older records, but not added to the system previously.

4.2.2 Internet searches

The internet was used to gather further details on sites and to identify others. The *Heritage Search* website also provides access to the catalogues of the Oxfordshire History Centre, various Oxfordshire Museums and the county's photographic collections. Key word searches such as 'water tower' or 'reservoir' were employed for text and images in wider search engines, particularly Google, with links to other sites followed. Among the more useful sites were the photograph collections of *Flickr* and *Geograph.*

The *MAGIC*^{TM} website proved invaluable as a source of grid references for features, with the *Digimap*^{R} modern and historic mapping helping to pinpoint locations.

4.2.3 Documentary searches

At an early stage, a systematic review of sources which deal with settlements in a systematic way, such as the *Victoria County History,* was carried out to identify sites. Whenever references to a site were found in more general texts these were added to the catalogue.

4.2.4 Field work

Whenever possible sites identified from other sources were visited to check on survival and condition and to enable a photographic record to be made. Where access was not

possible or there was no opportunity to carry out the field visit, photographs from other sources have been used to illustrate the catalogue. For some non-extant sources the only visual record is a contemporary drawing.

Fieldwork was organised on two lines: opportunistic and systematic. Whenever possible any visit to a new area of Oxfordshire was viewed as a chance to inspect known features and to record any unexpected sites.

A series of targeted visits was carried out to particular areas of the county, planned around known sites, but also visiting other settlements en route or in the vicinity, yielding several additional sites.

In early 2012 the author was employed on a project for Cherwell District Council, which required every settlement in that district to be visited for a walkover survey. Such systematic fieldwork would not otherwise have been possible and the opportunity was taken to record all water supply features seen. Locations of known sites were marked on maps in advance and the majority were identified in the field. Again, several additional sites were identified.

Other visits were made at the invitation of individuals or groups with an interest in water supply. As well as local societies, The Greenmoor Conservation Group and the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT) invited the author to advise on their restoration projects (see Chapter 7).

4.3 Statistical and Spatial Analysis

4.3.1 Identified sites

The database of water-related sites in Oxfordshire contains a total of 910 entries (Figure 4.4), which shows the sites identified across the whole county, although with a lower density in the Vale of White Horse District. When the distribution is related to geology (Figure 4.5) a lower density is also apparent on the Oxford Clay, apart from in Oxford itself, with the greatest density seen in limestone areas. Although there are many sites away from them, significant clusters of sites are associated with rivers (Figure 4.6).

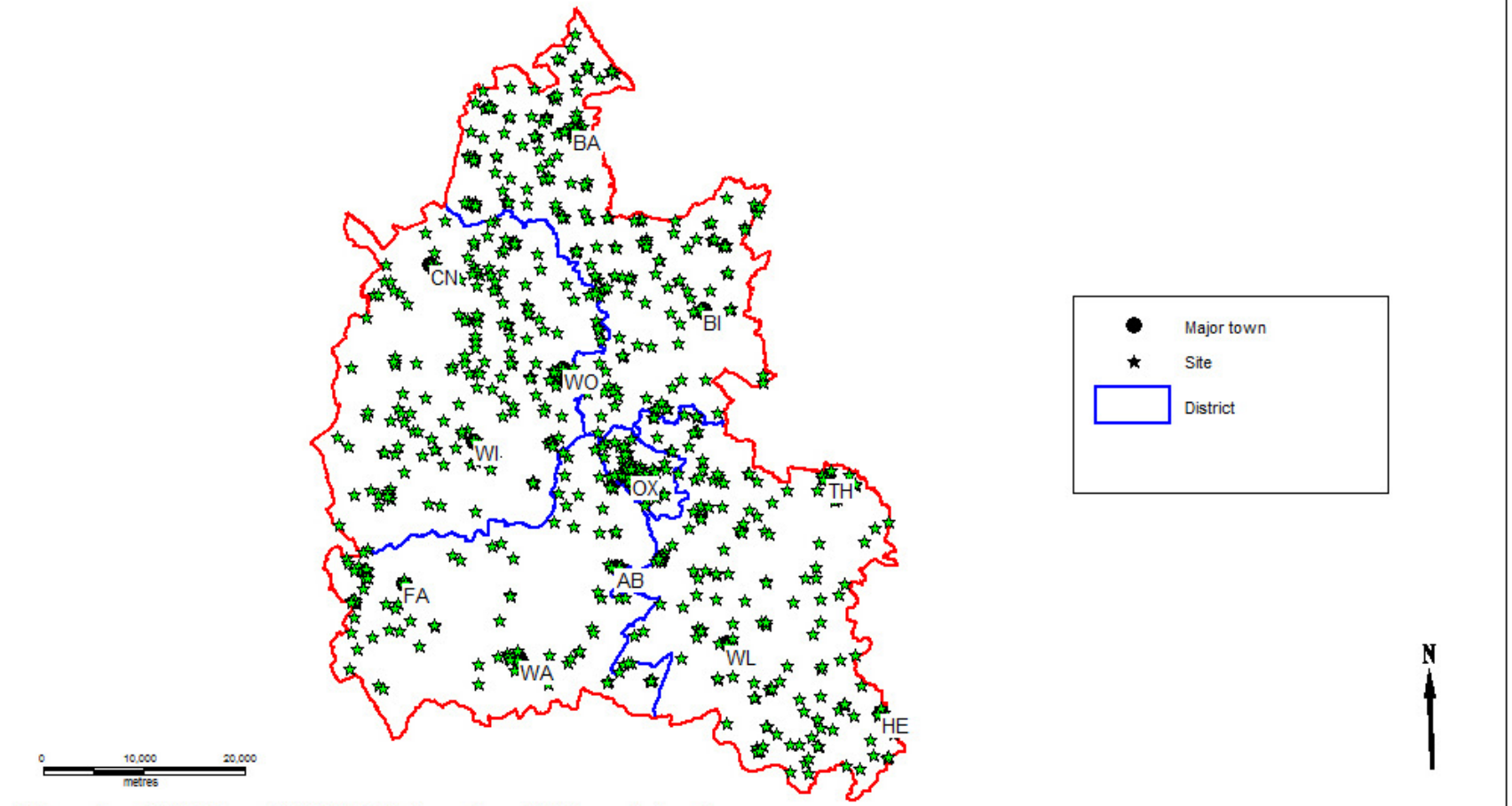
The 33 different types of site identified have been placed in seven categories as shown below.

Category	**Site type**
Supply	Aqueduct; Conduit; Culvert; Fountain; Holy well; Pipe; Pond; Pump; Pump house; Shaduf; Spring; Tap; Trough; Well; Well house; Well head.
Processing	Pumping Station; Waterworks.
Storage	Reservoir; Tank; Water tower.
Leisure/ornament	Lake; Park; Swimming pool.
Health/cleanliness	Bath; Wash house.
Waste	Drain; Latrine; Sewage works.
Miscellaneous	Mineral water factory; Residential; Stream; Turbine.

Table 4.3: Site Types by Category

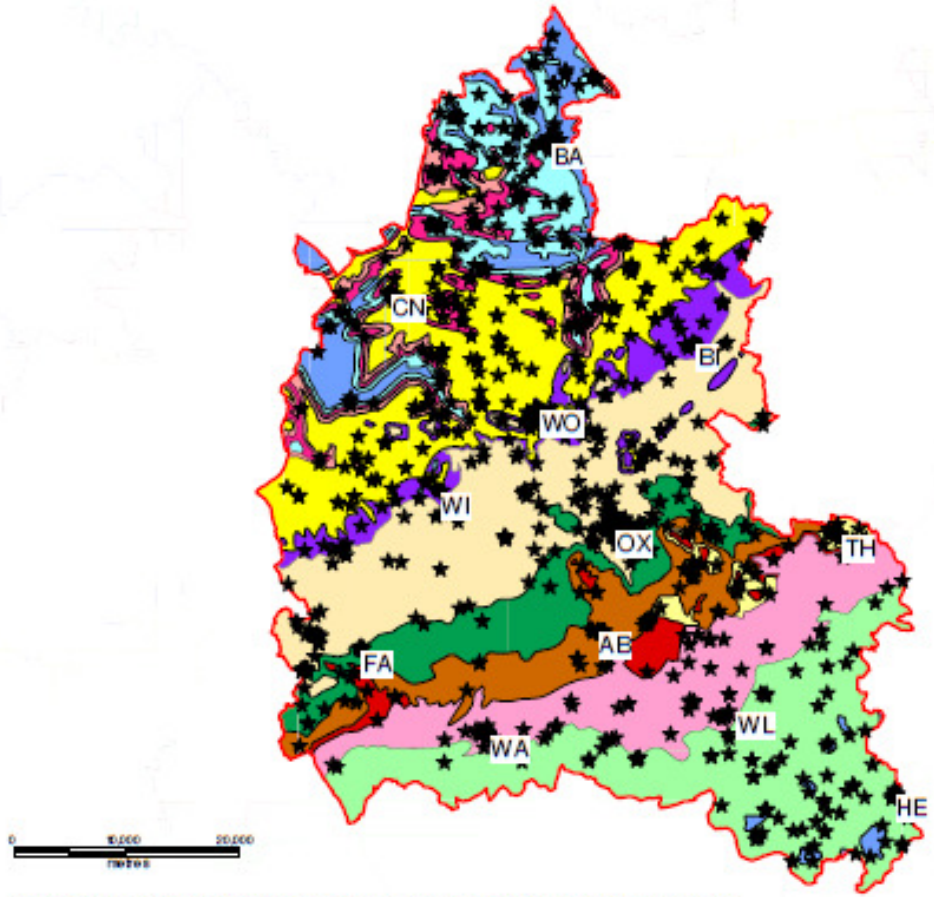
The majority of sites, 660, relate to 'supply', followed by 113 features related to 'storage'. The' miscellaneous' category, 23 sites, includes housing and some sites connected to water power referred to in the text.

Figure 4.4: Distribution of Sites



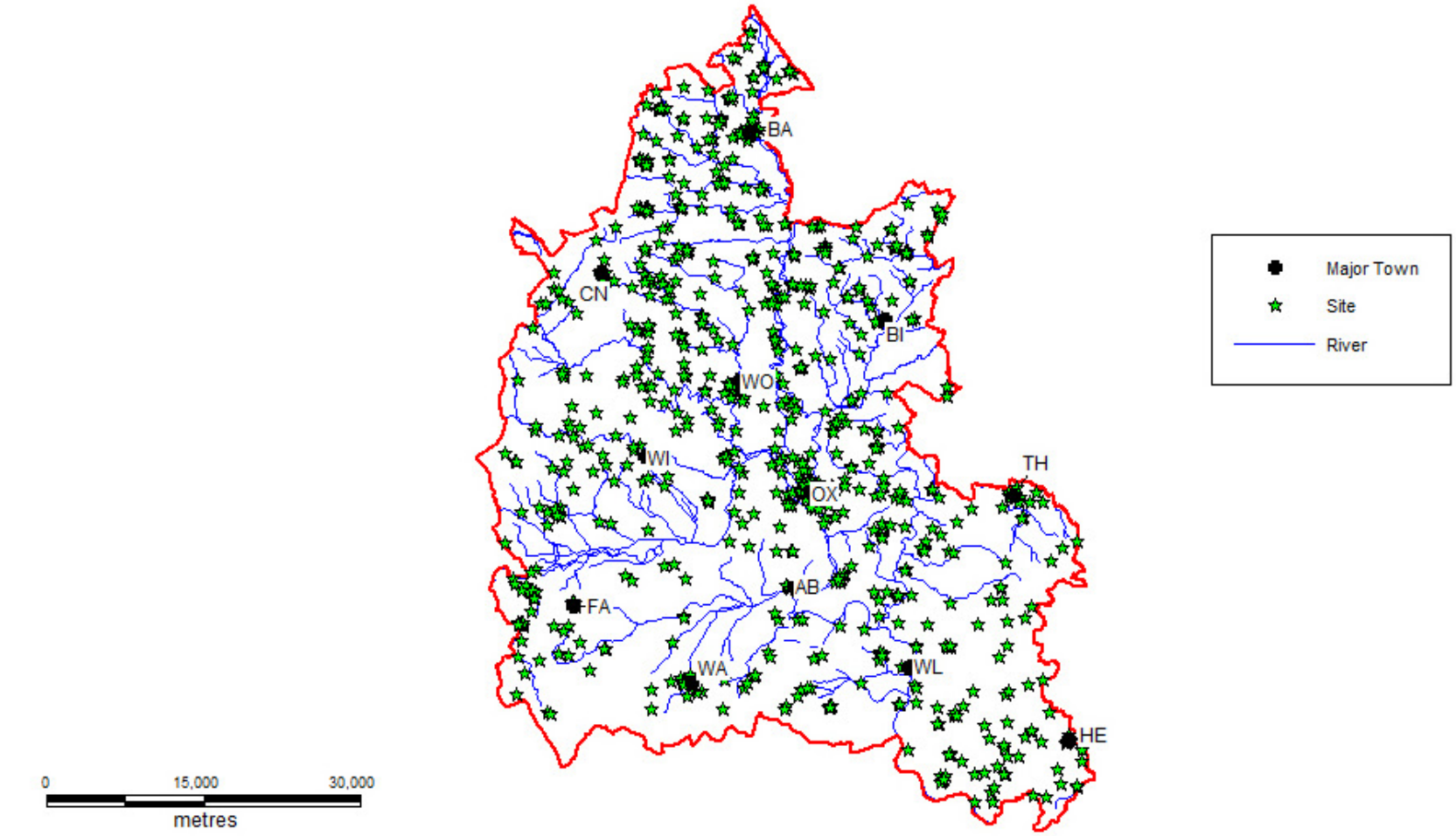
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Figure 4.5: Distribution of Sites in Relation to Geology



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Figure 4.6: Distribution of Sites in Relation to Rivers



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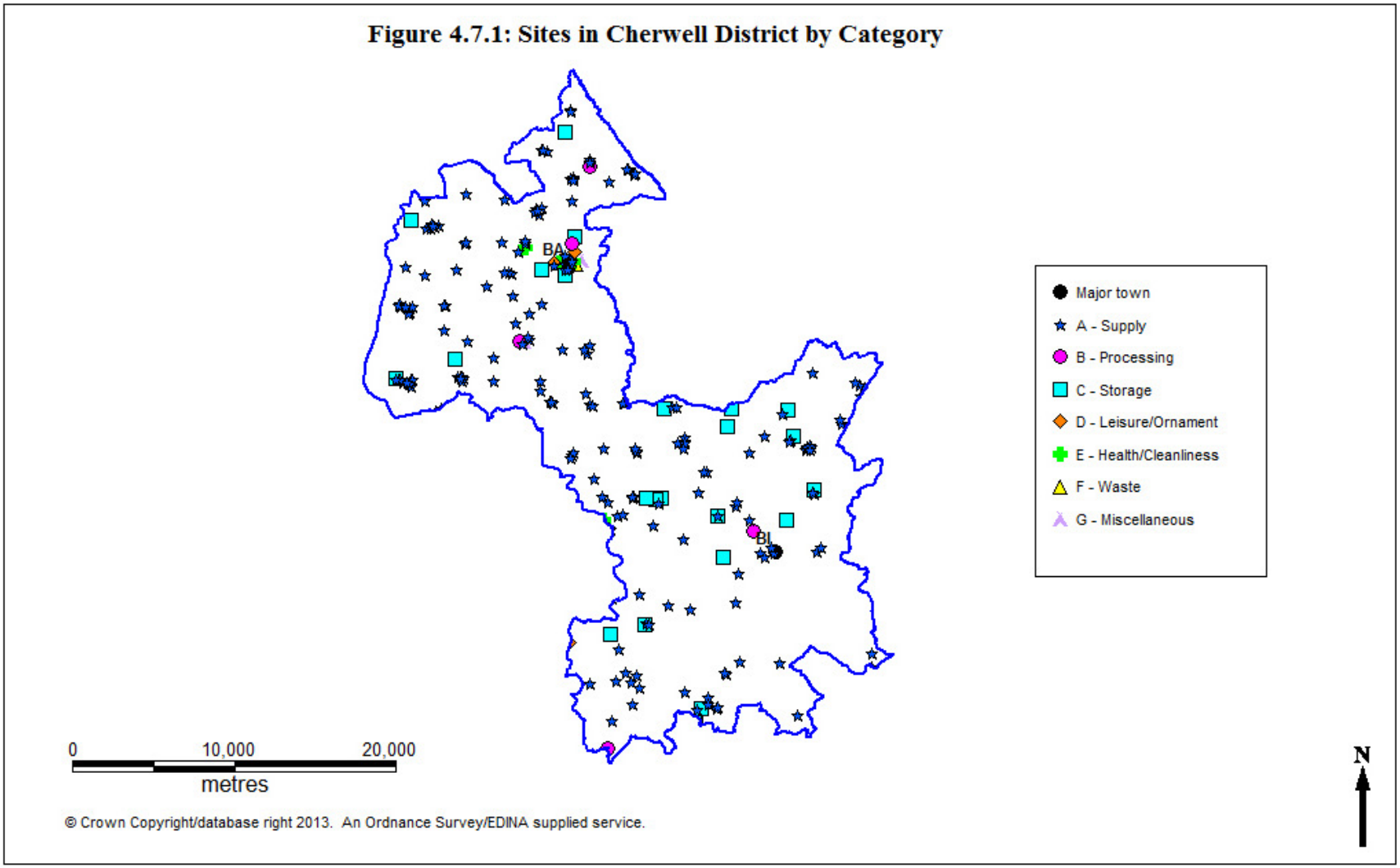
The distribution of sites across the categories, for the total number of sites and each District, is given in Table 4.4 and Figure 4.8 below.

Category of Site	Cher-well	Oxford City	South Oxford-shire	Vale of White Horse	West Oxford-shire	Total Sites
Supply	221	77	149	68	146	659
Processing	5	4	6	5	9	29
Storage	22	16	30	24	21	113
Leisure/ornament	2	12	11	7	17	49
Health/cleanliness	3	12	2	2	3	24
Waste	1	6	3	1	2	13
Miscellaneous	2	11	2	4	4	23

Table 4.4: Distribution of Sites by Category

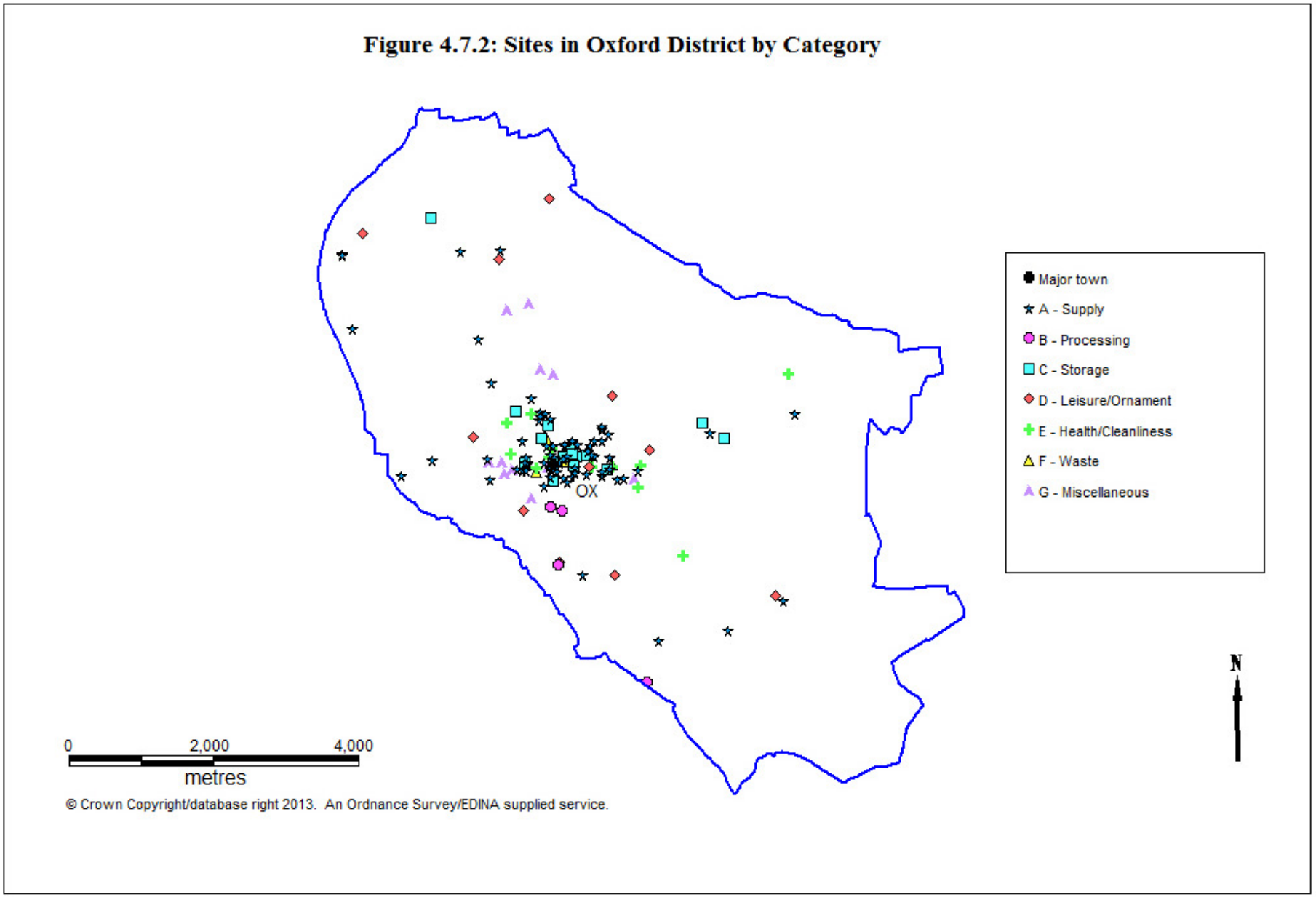
The distributions for the various Districts are shown in Figures 4.7.1-4.7.5.

Figure 4.7.1: Sites in Cherwell District by Category



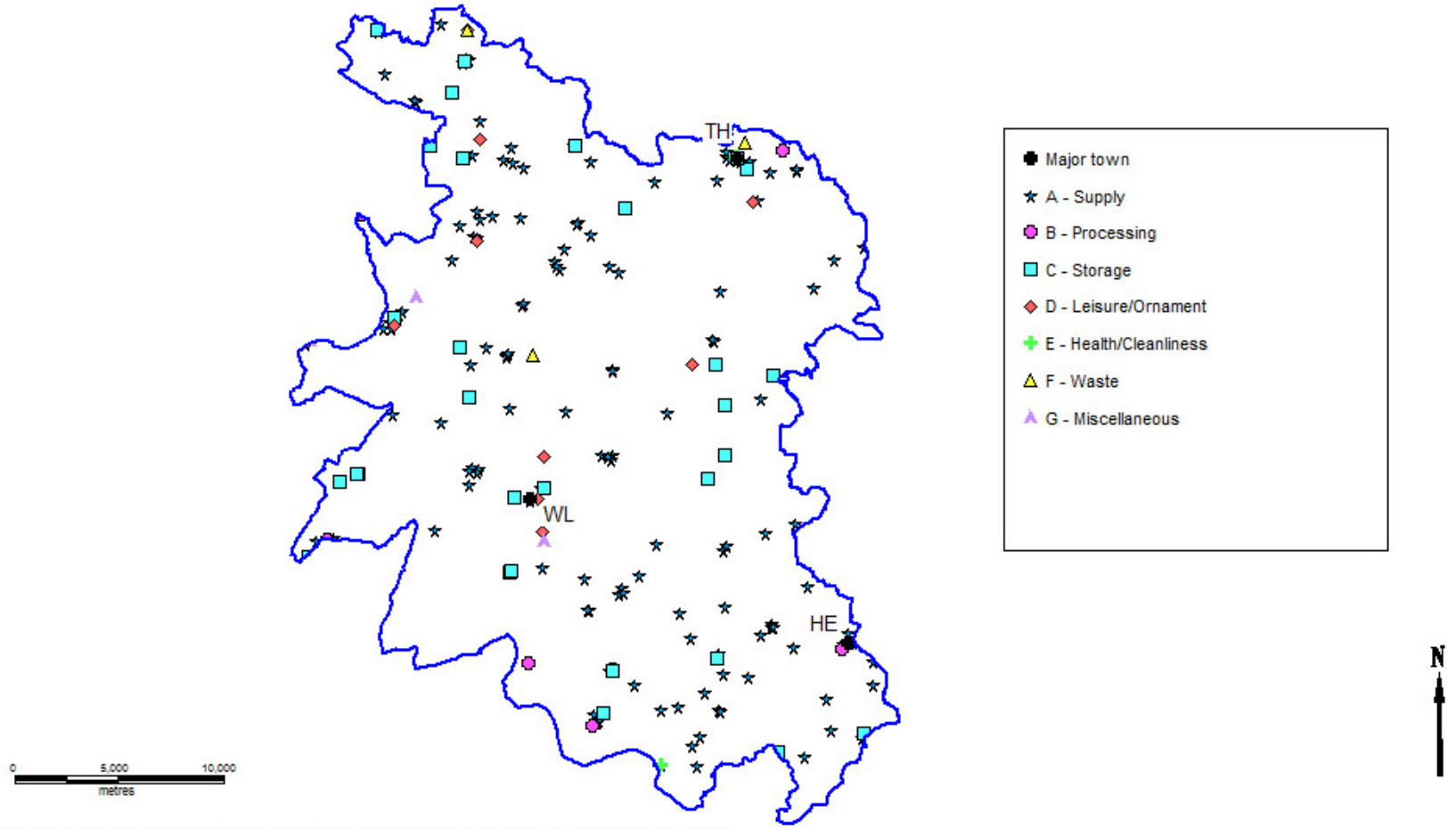
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Figure 4.7.2: Sites in Oxford District by Category



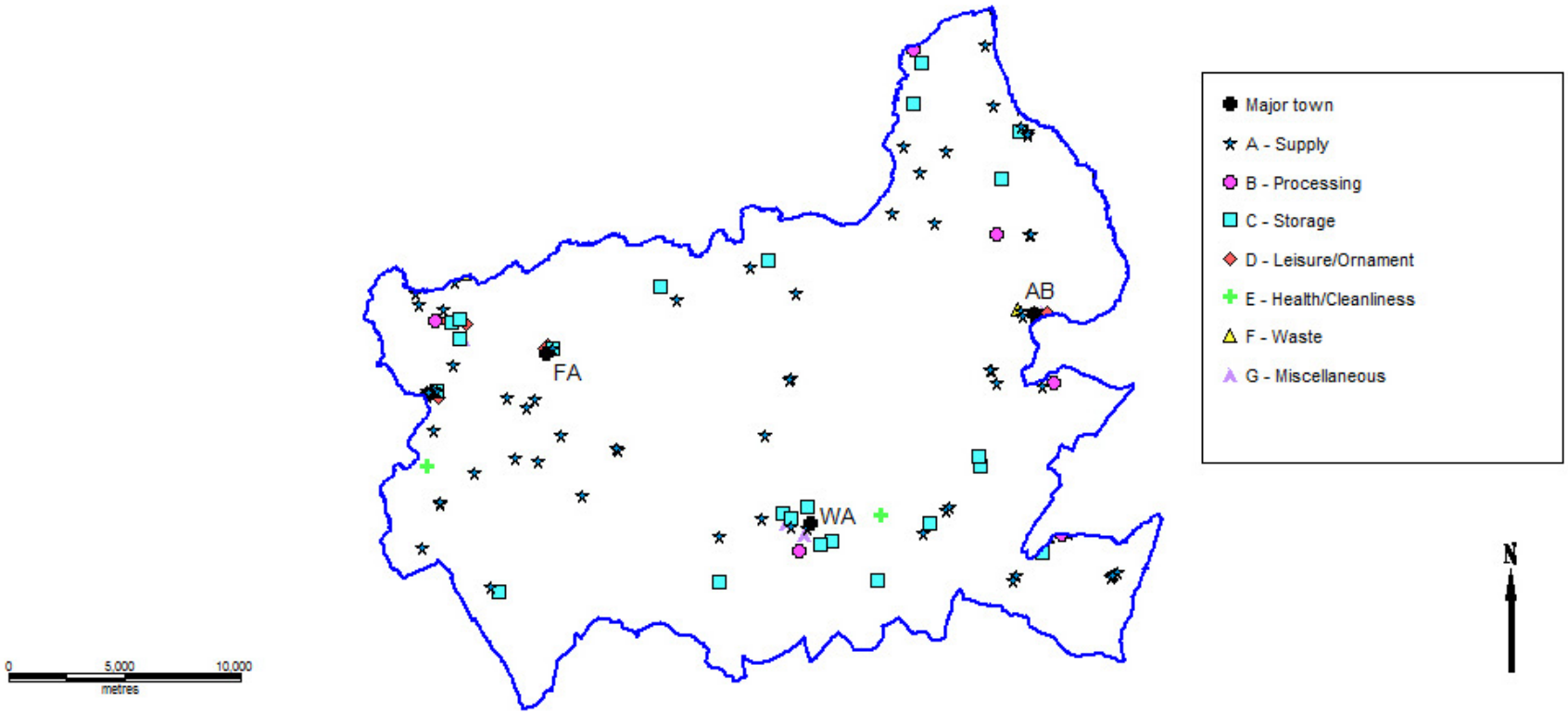
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Figure 4.7.3: Site in South Oxfordshire District by Category



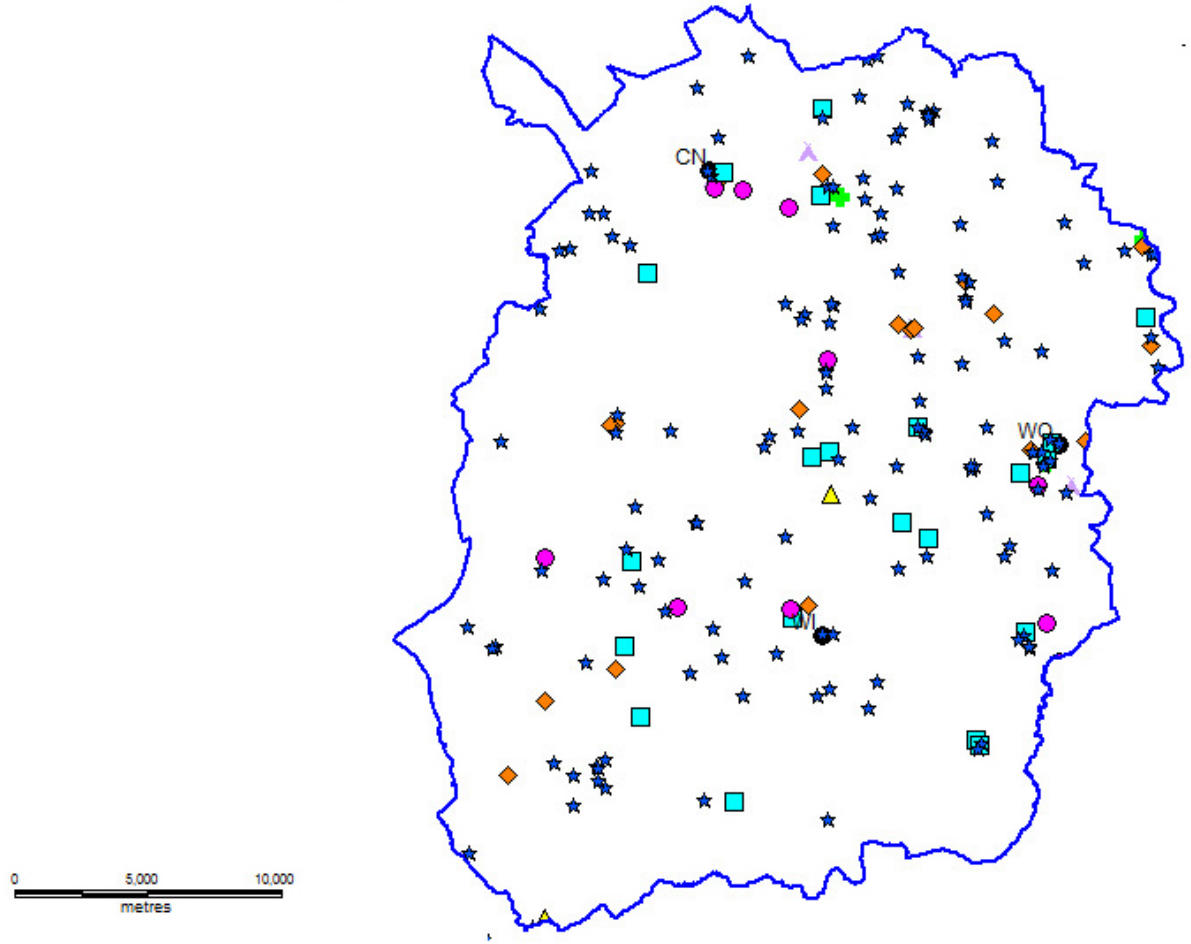
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Figure 4.7.4: Sites in Vale of White Horse District by Category



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Figure 4.7.5: Sites in West Oxfordshire District by Category



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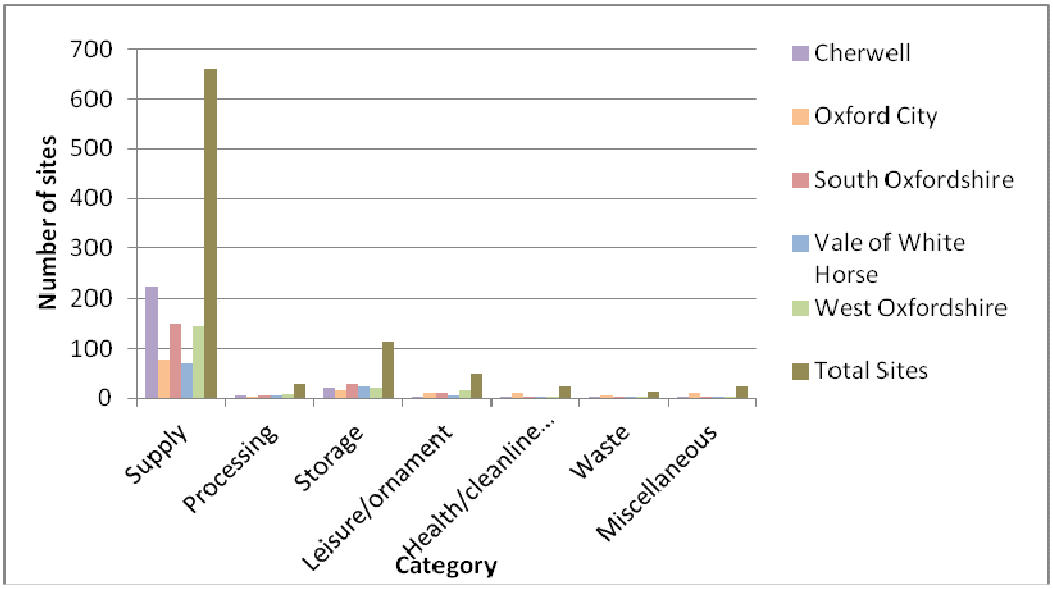


Figure 4.8: Distribution of Sites by Category

The most common type of site was ‘well’ (203), followed by ‘pump’ (156). ‘Holy wells’, ‘spring’ and ‘water tower’ all scored more than 50 sites. The data for all types is shown in Table 4.5, again with a breakdown for each District.

Type of Site	Total	Cherwell	Oxford City	South Oxford-shire	Vale of White Horse	West Oxford-shire
Aqueduct	1		1			
Bath	21	3	12	1	2	3
Conduit	12	1	2	3	6	1
Culvert	1		1			
Drain	3		2		1	
Fountain	35	3	12	7	2	11
Holy Well	59	11	15	9	1	23
Lake	2			1		1
Latrine	8		4	2		2
Mineral Water Factory	2					2
Park	18			6	3	9
Pipe	4		3			1
Pond	45	17	3	16	6	3
Pump	156	61	12	28	26	30
Pump House	30	5		8	6	11
Pumping Station	7	2	1	2	1	1
Reservoir	36	5	3	8	16	4
Residential	19	2	11	2	2	2
Sewage Works	2	1		1		
Shaduf	1		1			
Spring	54	31	1	8	2	12
Stream	1				1	
Swimming Pool	29	2	12	4	4	7
Tank	18		12	2	1	3
Tap	32	17	3	5		7
Trough	14	5	4	1		4
Turbine	1				1	
Wash House	1			1		
Water Tower	59	17	1	20	7	14
Waterworks	22	3	3	4	4	8
Well	203	69	19	59	18	38
Well Head	5	1		3	1	
Well House	9			3	1	5

Table 4.5: Distribution of Sites by Type

The distribution of total sites across the different site types is also shown in Figure 4.9.

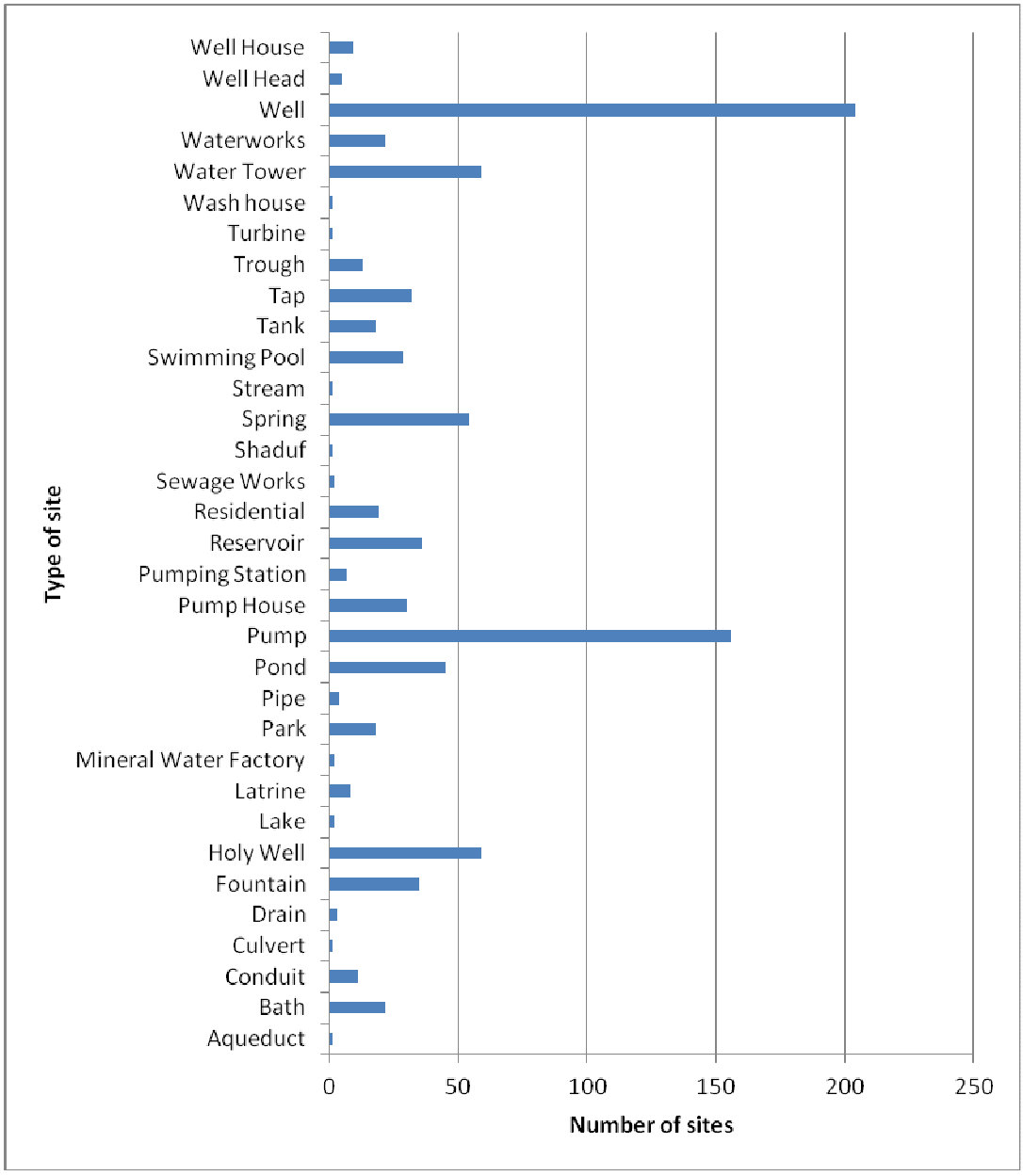


Figure 4.9: Distribution of Total Sites by Type

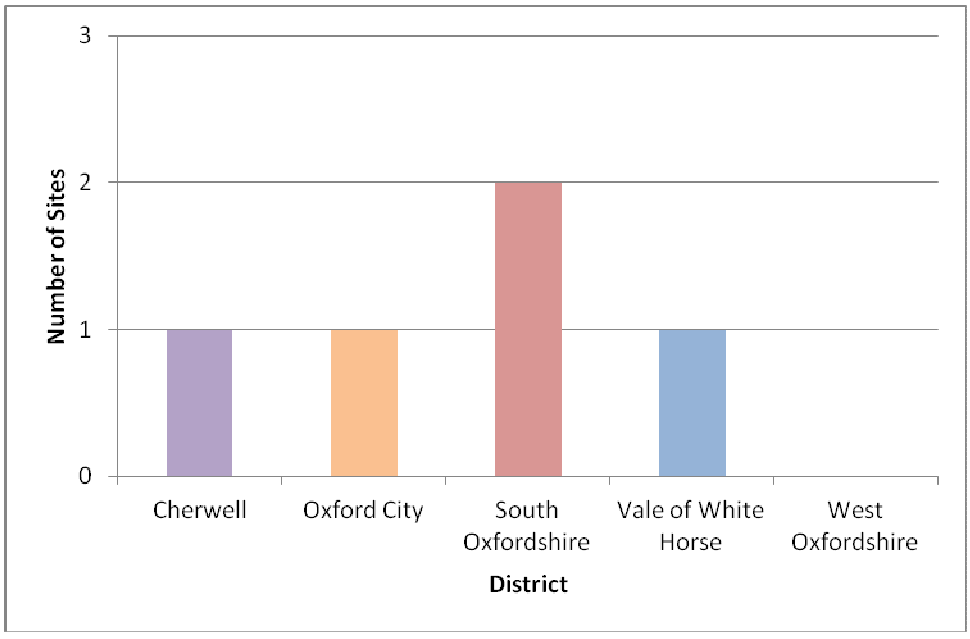
The category ‘holy well’ has been used for some popular holy wells, such as that at Binsey (OX007), but has also proved useful for early sites about which there is little detail other than a general location and the date of its first documentary record, such as Mother Hiddlemeer's Spring, Nettlebed (SO077). The problem with such sites is the loose application of the term ‘well’ for something which may in fact have been a spring,

with little modification. The blanket term avoids defining a site as 'well' or 'spring' incorrectly. Where a site continued to be used into the post-medieval period or beyond, its form is usually clearer, enabling more accurate classification, such as the Lady Well, Bampton (WO083).

4.3.2 Designated Sites

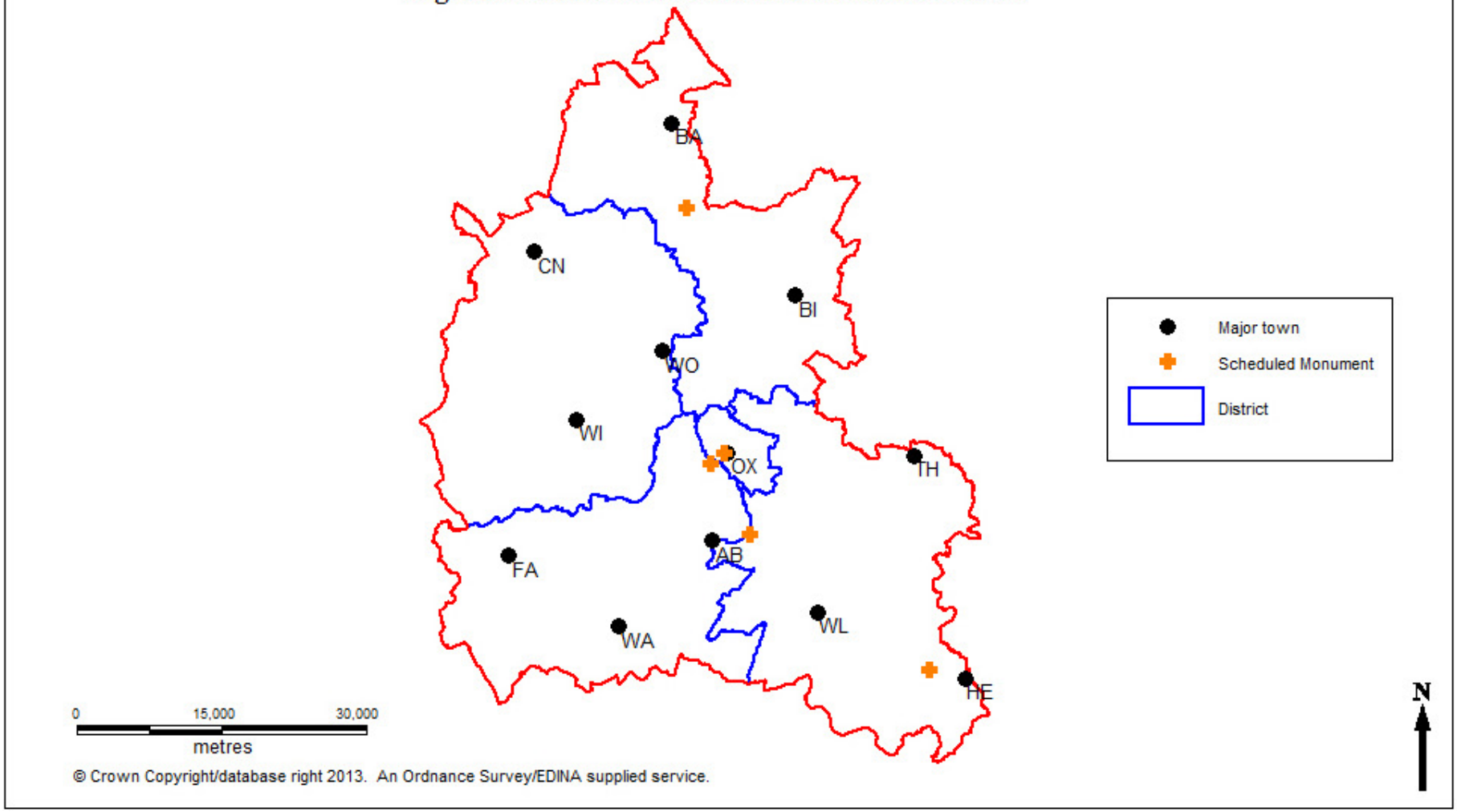
Only five sites are Scheduled Monuments or are included within one. Both Deddington Castle and Oxford Castle are scheduled and both include a well site (CH032, OX011). Similarly the well-house and donkey-wheel at Greys Court (SO006) are part of a larger scheduled area. The other two Scheduled Monuments are the Carfax Conduit (SO025) and North Hinksey Conduit House (VW020). The distribution across the districts is shown in Figure 4.10 and in Figure 4.11 below.

Figure 4.11: Distribution of Scheduled Monuments by District



There are far more Listed Buildings related to water, 98 in total. The number in each district is shown below. In a number of instances the listing relates to a larger structure

Figure 4.10: Distribution of Scheduled Monuments



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which includes the water feature, which may or may not be mentioned in the list description. Examples include the garderobes at Beckley Manor (SO108), where the house is listed, and Stiles Almshouses in Wantage (VW110), where the pump is not mentioned. Most of the features are the direct subject of the Listing. The distribution of Listed Buildings across the Districts is shown in Figures 4.12 and 4.13.

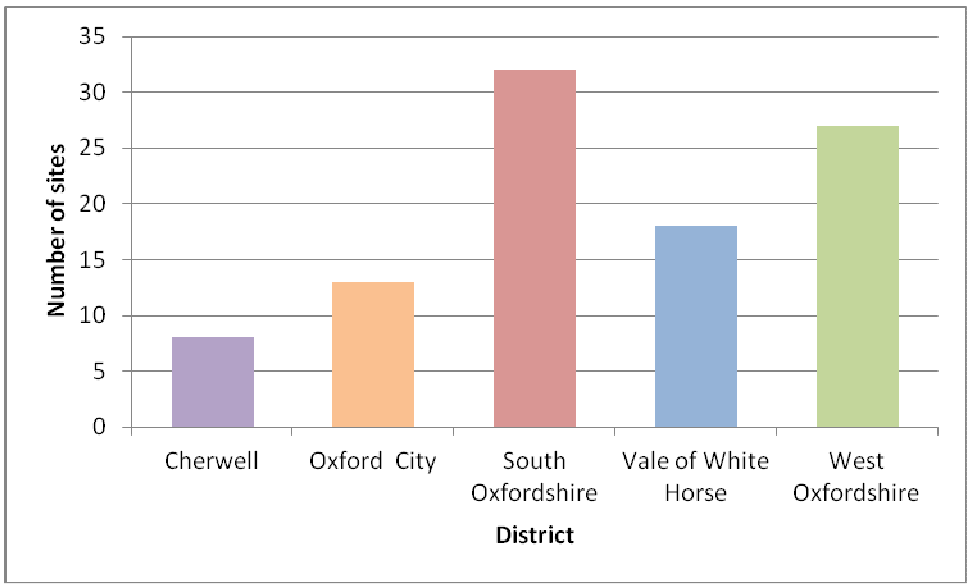
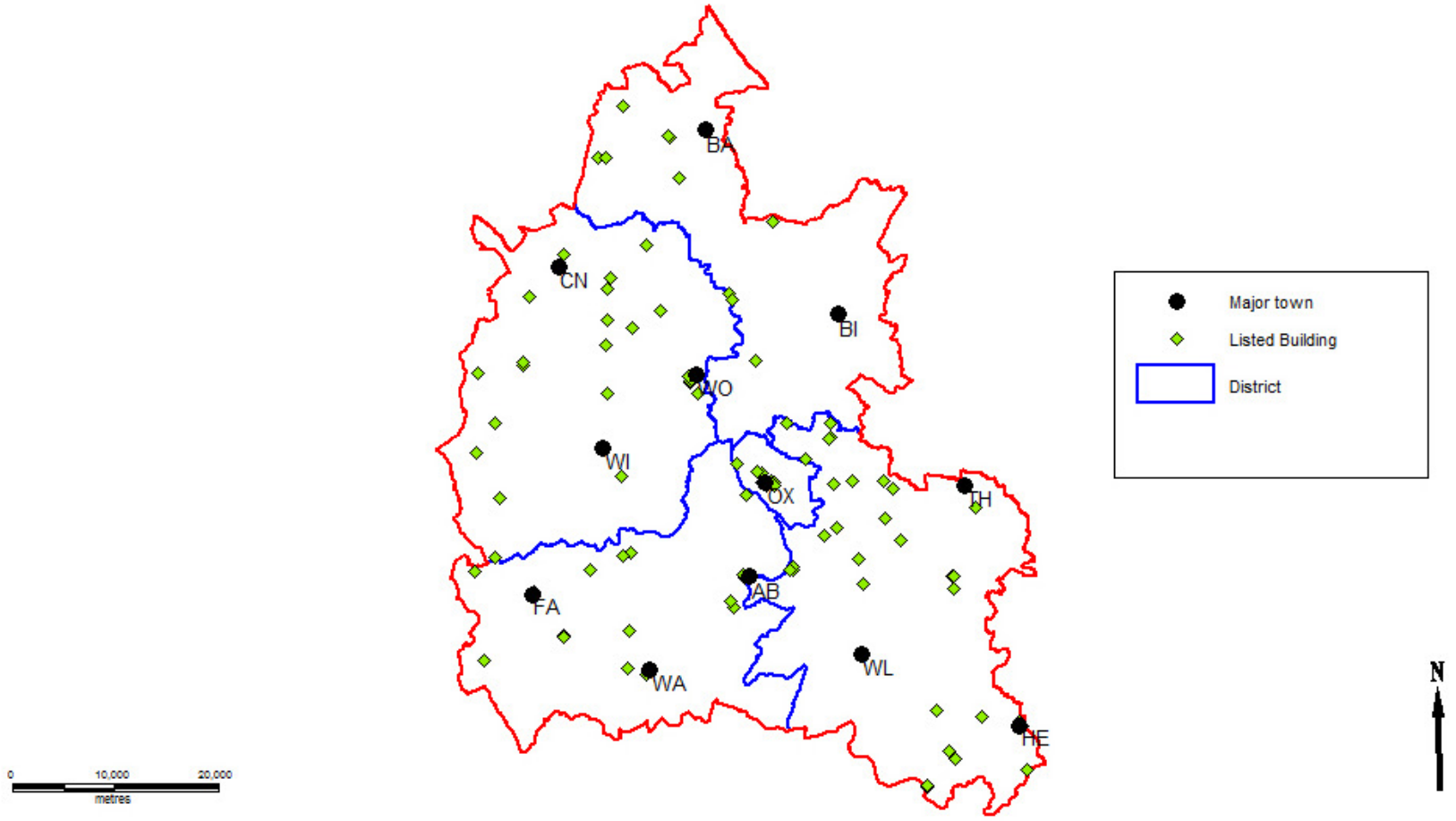


Figure 4.13: Distribution of Listed Buildings by District

The number of Listed Buildings varies considerably between the Districts, Cherwell being particularly badly represented. The figures for South Oxfordshire and West Oxfordshire reflect the abundance of parks and gardens containing significant water features, which are listed, in particular at Blenheim Palce. Oxford City covers a much smaller area than the other Districts so the lower figure is not so surprising. Apart from these factors there is no obvious reason why the numbers vary so much. Although there was a major survey of buildings after the listing system was established (Hunter 1996, 120) and some widespread review in the 1980s (Pearce 2000), additions to the list are generally made in response to either a nomination or a development threat. The majority of significant developments in Oxfordshire have been located in and around its towns or

Figure 4.12: Distribution of Listed Buildings



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were associated with mineral extraction. Cherwell contains three genuine towns, of which only Banbury was historically significant. However, it is more likely that the variation has arisen because of different levels of interest in water supply across the respective Conservation Officers.

There are 15 Registered Parks and Gardens (RPGs), of which none lies within Oxford City or Cherwell and only one in Vale of White Horse. Although this only includes the RPGs for Oxfordshire with significant water features, a fraction of the total, the uneven distribution is not random, but very closely related to their underlying geology (Figures 4.14 and 4.15).

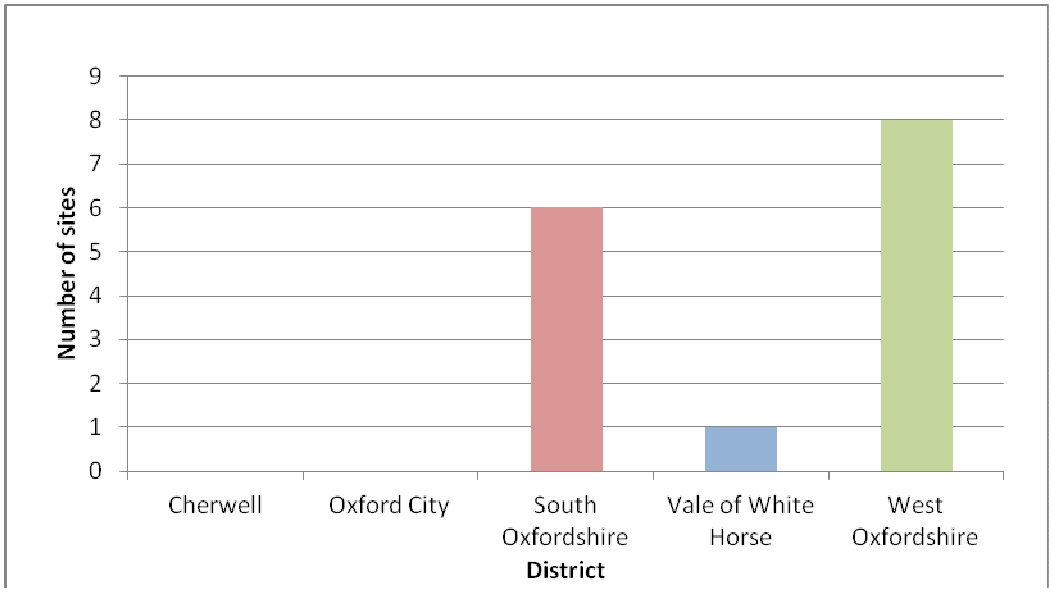
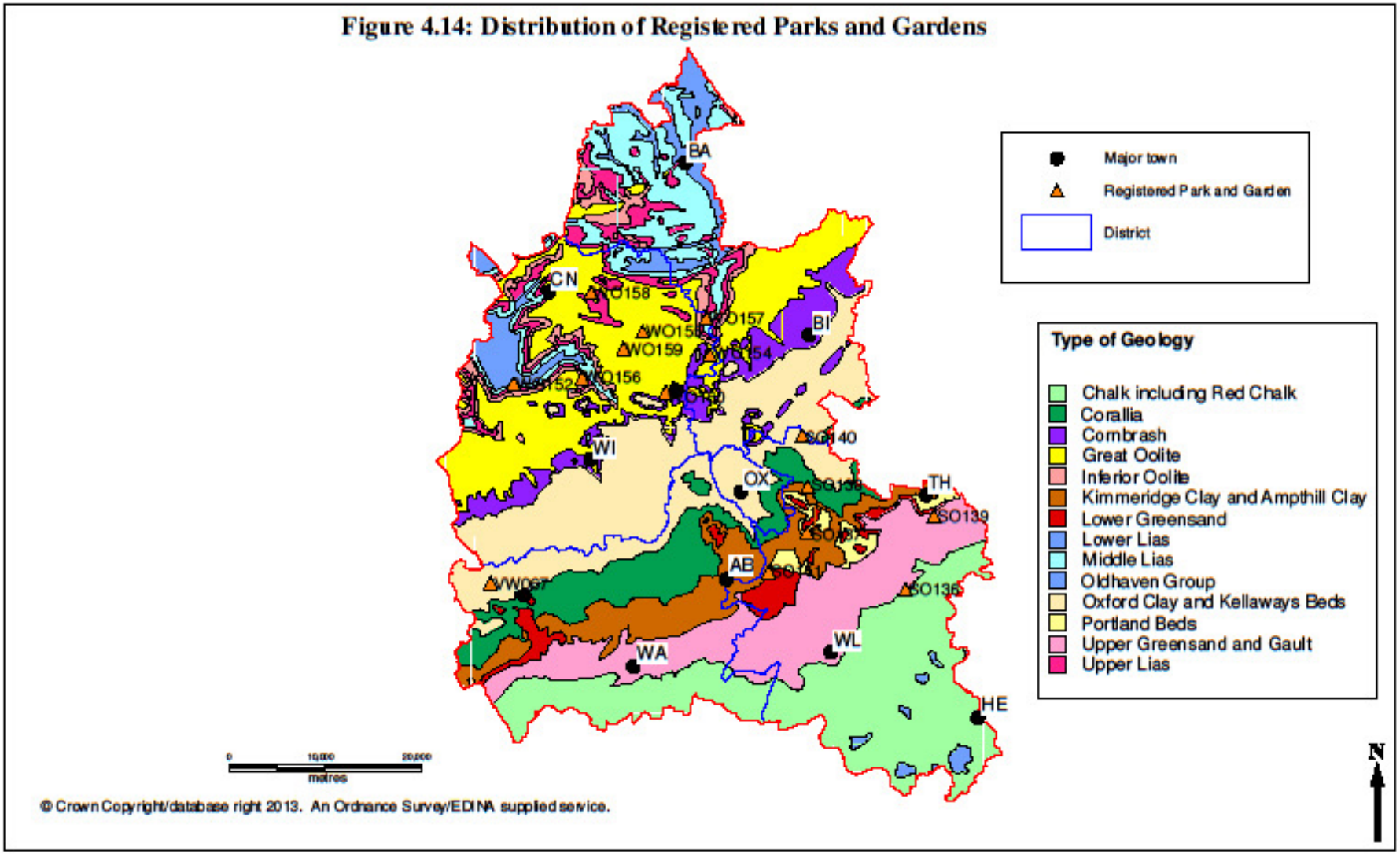


Figure 4.15: Distribution of Registered Parks and Gardens by District

Of the 15 RPGs, 8 lie on areas of Limestone geology. Two lie on Upper Greensand and the remaining five on Oxford Clay. Not all of these parks incorporate or lie close to a significant natural water course, but may incorporate a design based around man-made lakes, such as Buscot Park (VW33), where they are supplied by pumps from the River Thames to the north of the park.

Figure 4.14: Distribution of Registered Parks and Gardens



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Of the 50 entries on the English Heritage Archive (Figures 4.16 and 4.17) only three are from Cherwell. There is no obvious explanation for this.

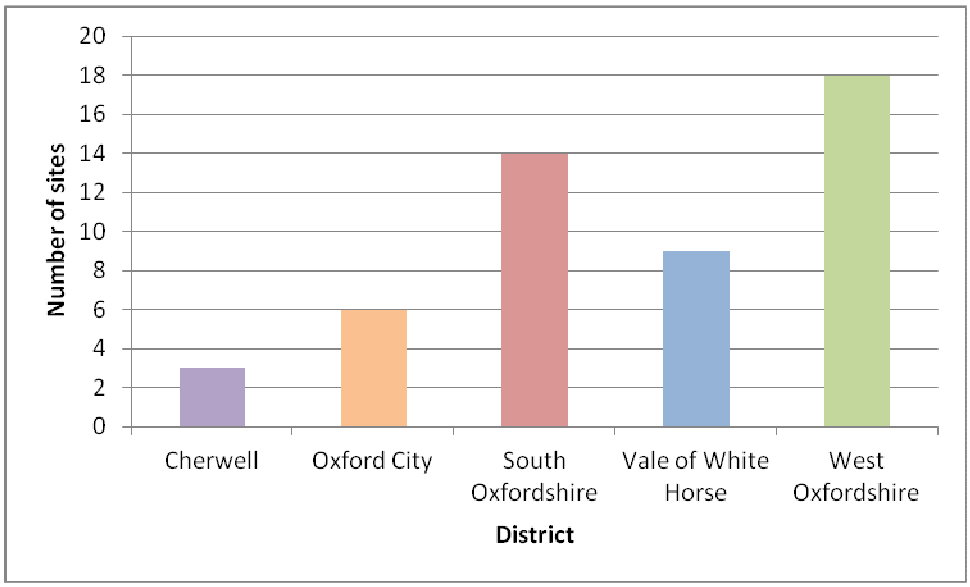
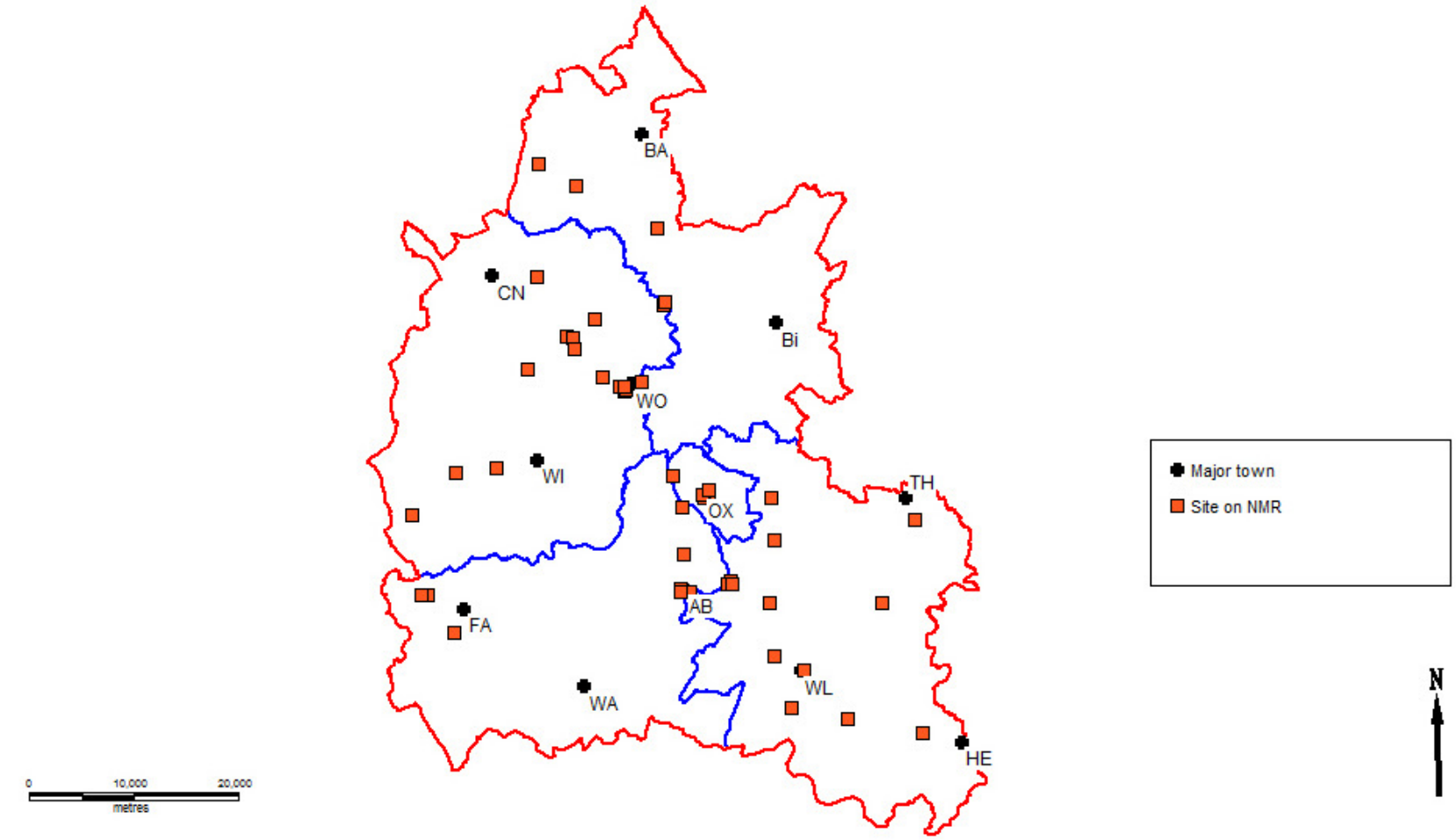


Figure 4.17 Distribution of EHA Entries by District

The distribution of sites on the HER and/or UAD shows Vale of White Horse as under-represented (Figures 4.18 and 4.19), having only 21 of 177 entries, possibly reflecting the inclusion of that part of the county in Berkshire until 1974.

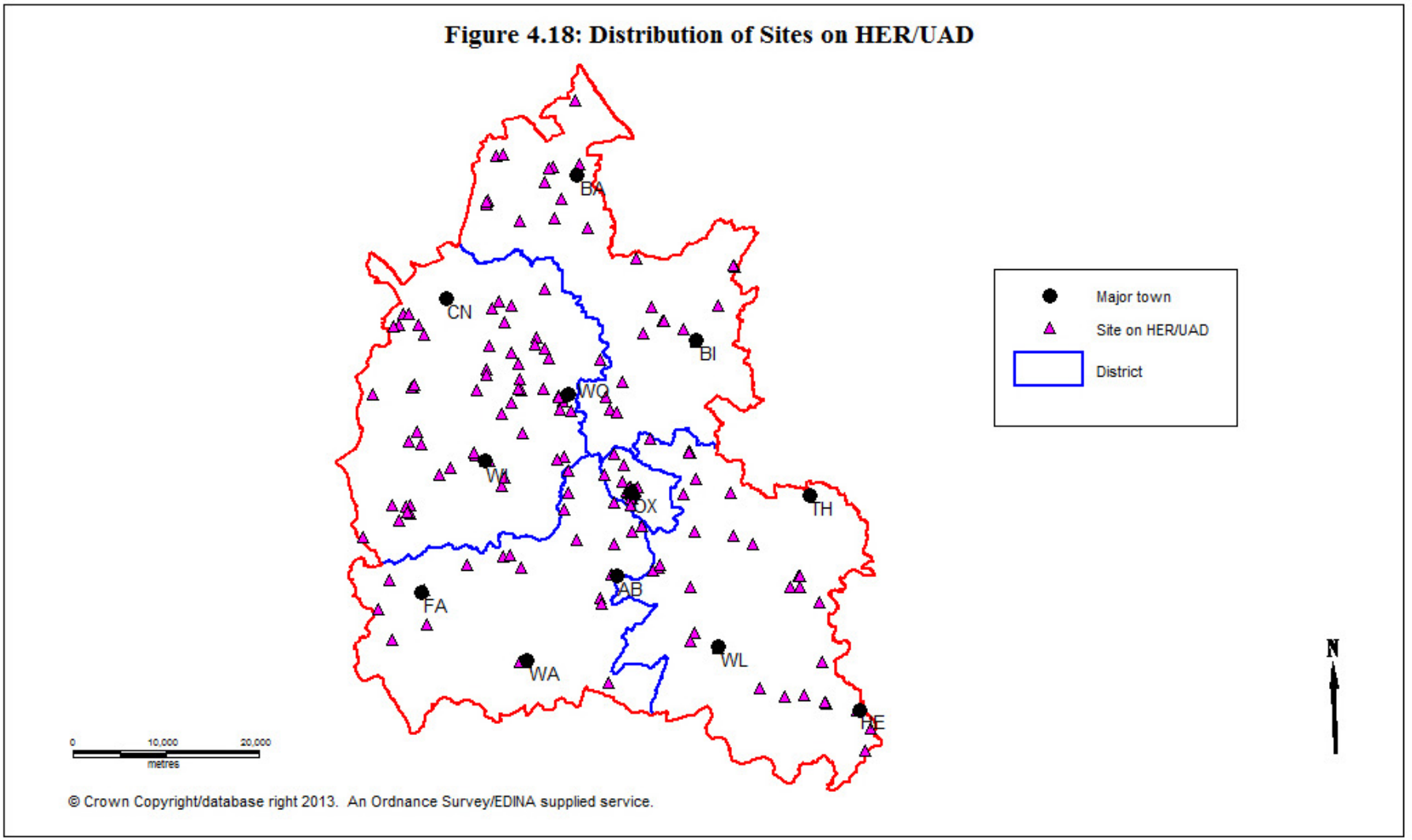
The comparatively low level of recording of sites on the EHA and HER is also a function of how such datasets have been compiled. Their original basis was record cards compiled by the Ordnance Survey in the earlier part of the 20th century. The system relied on a network of local informants, whose suggestions were then surveyed and recorded. Most of the entries added to the records relate to sites identified following archaeological investigations. Both the EHA and HER have carried out programmes to add information from published journals, catalogues of museums and other collections and the results of research initiatives, but the resources available are limited. Since these processes are unlikely to identify exisitng, small-scale features associated with water supply, their

Figure 4.16: Distribution of Sites on EHA



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Figure 4.18: Distribution of Sites on HER/UAD



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comparative rarity in the record is not surprising and does not reflect any perception of unimportance on the part of those maintaining the records.

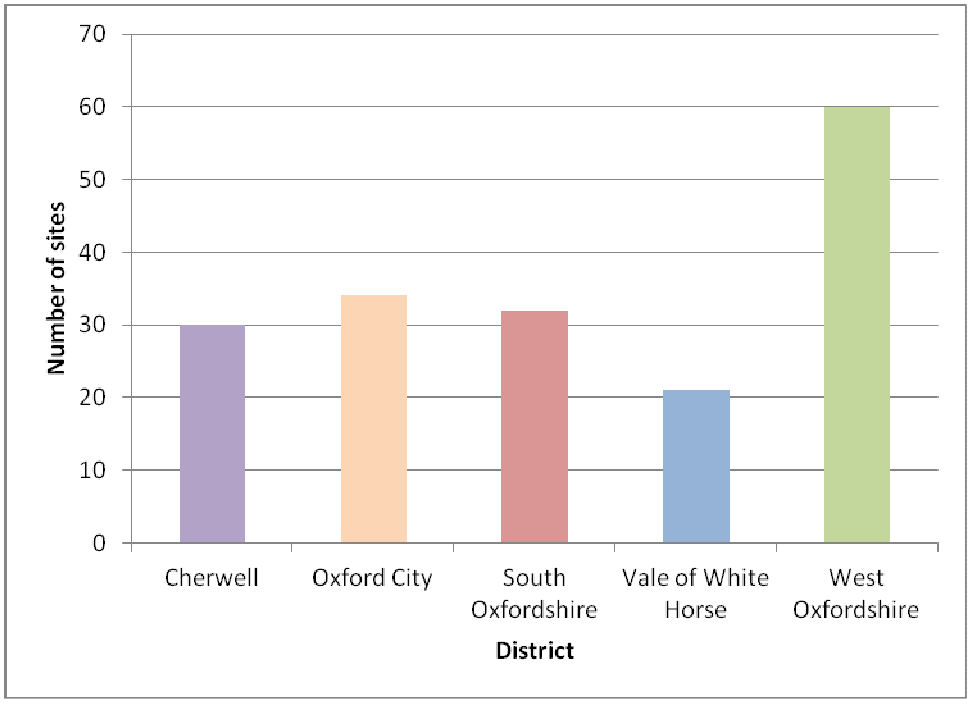


Figure 4.19: Distribution of HER/UAD Entries by District

The number of sites unrecorded on any heritage designation system is very high at 72.97% of the 910 total. While many of these 664 sites would not merit any level of statutory protection, the local heritage value of a significant number should merit inclusion on the HER/UAD. It is not always clear why one is Listed while a very similar feature is not. The Wilder's of Wallingford well with its pyramidal timber roof at Wood Lane, Kidmore End (SO009) is Listed Grade II, while the apparently identical well and roof on Gallowstree Common Road, Sonning Common (SO008) is not even recorded on the HER. Similarly, no public pumps in South Oxfordshire are Listed although there are five in each of Cherwell and Vale of White Horse Districts, despite only 24 pump sites in total having been recorded in the Vale compared to 61 in Cherwell and 38 in South Oxfordshire. Vale of White Horse has also Listed a higher proprtion of its wells (2/18) and West Oxfordshire a very large proportion of its fountains (9/11). Even when the

extensive water gardens of Blenheim Palace are taken into consideration the figure is still high (6/11). It is possible that these variations arise from the level of interest and knowledge of those involved in the recording process.

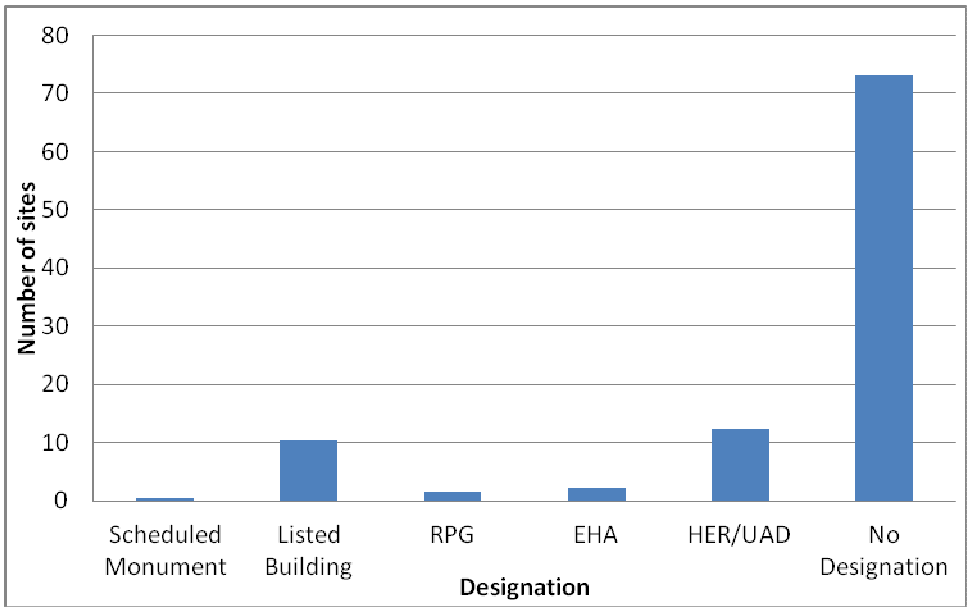


Figure 4.20: Distribution of Sites by Level of Designation

4.3.3 Parish Types

As shown in Table 4.1 there is a difference in the distribution of different types of parish across the Districts. Oxford City represents a special case, consisting of the non-parochial urban area and some smaller areas which were gradually absorbed as a result of urban expansion. There is a higher proportion of closed parishes in all other Districts apart from the Vale of White Horse, where the figures are almost equal. This difference may reflect the large proportion of parishes with chalk geology in the Vale of White Horse, plus the different method used to determine the parish type. In South Oxfordshire the closed parishes are predominantly in the northern half of the District, only four of the 34 lying on the chalk geology in the south. In West Oxfordshire there are more than five times as many closed as open parishes and for Cherwell the ratio is 4:1. The frequency of

closed parishes in these areas is related to their geology and topography (see Chapter 3).

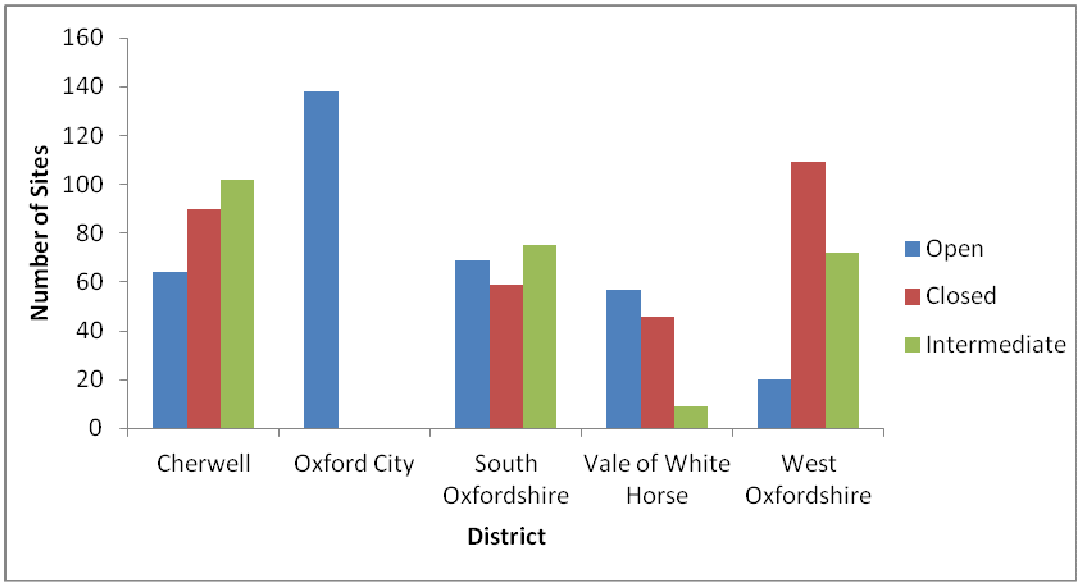


Figure 4.21 Distribution of Sites by Parish Type

The relationship between water supply and parish type is discussed in more detail in Section 4.4 below.

4.3.4 Sites by Date

The sites have been assigned to broad historical periods as shown in Figure 4.22. Some 84 could not be dated.

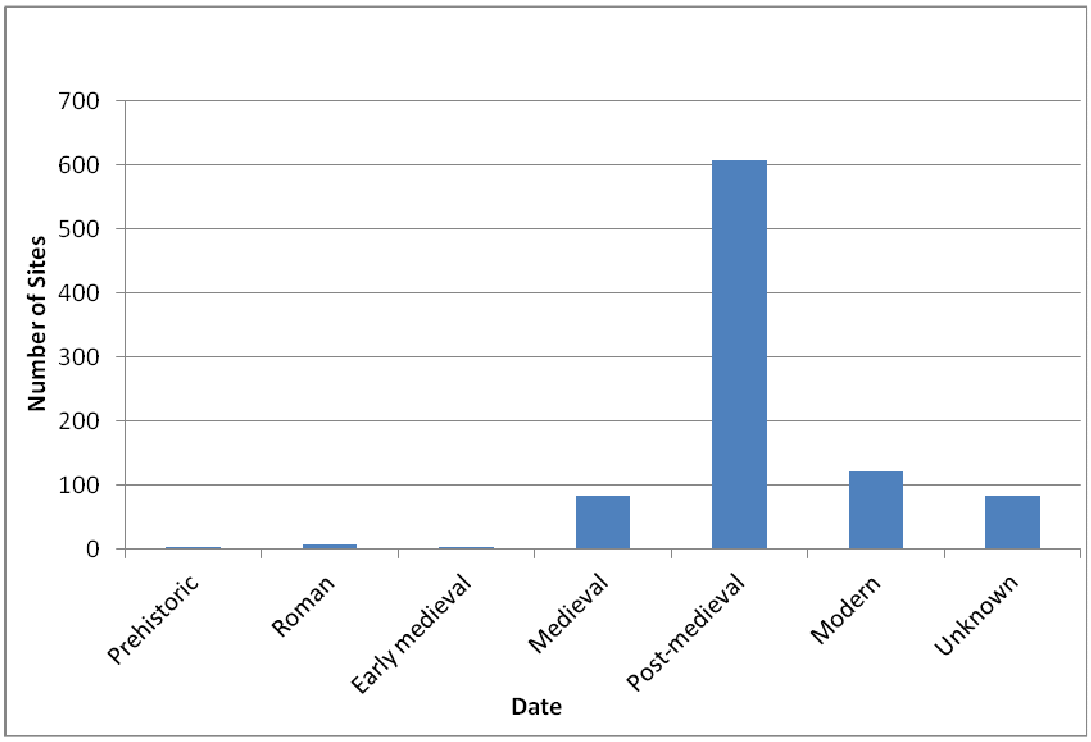


Figure 4.22 Distribution of Sites by Date

Of the 910 sites recorded, only one at Manor Farm, Noke (CH002) dates from the prehistoric period. This well appears to have been in use since that period, based on finds of prehistoric and later pottery (Cheetham 1995, 420). There were seven sites dating from the Roman period, six of which were HER entries. The other, a tessellated pool (CH089), was listed as an ancient site (Rattue 1990 p174) and appears to be connected to Woodeaton Roman Temple (Goodchild & Kirk 1954, 17). The number of early medieval sites is also low, two well sites (SO037, SO067) listed by Rattue (Rattue 1990) and one spring recorded on the HER (SO029).

For the medieval period, 84 sites were recorded. Most of these, 57 in all, are ancient or

holy wells identified by Rattue, many of which are only known from brief documentary references (Rattue 1990, 1992). There are 18 early well sites which are still recognised and serve some function, including St Margaret's Well, Binsey, visited for its connection to Lewis Carroll's *Alice* books (Gardner 1960). The most significant sites are those which have been part of Easter Monday and May Day ceremonies until very recently, at Bampton (WO083), Wilcote (WO043) and in Cornbury Forest (WO066, WO089).

Others are sites known from excavations or documentary sources, which have been recorded on the HER and/or are referred to in the historical review in Chapter 3. Two wells are located in the medieval castles of Deddington (CH032) and Oxford (OX011). Elsewhere in Oxford, St Edmund Hall has a well in its main quadrangle (OX 049) and the medieval latrine at New College continued to be used, with alterations, until the 20th century.

By far the largest proportion of the sites, 611 in total, are of post-medieval date and mostly from the 19th-century, although it is not always possible to ascribe a precise date. There are 7 from the 16th century, including the well at Greys Court (SO006) and the conduit house in Abingdon (VW001). Most of the 32 sites from the 17th century are in Oxford, identified from Loggan's 1675 map of the city, which shows the Carfax Conduit (OX016). Linked to this structure were the North Hinksey Conduit House (VW020) and associated infrastructure. The 18th century saw the creation of many of Oxfordshire's major landscaped parks and of the 50 sites from that century, many are connected to these parks. The bath house at Heythrop Park (WO013) and the water supply to Coleshill House (VW096) are examples.

There are 252 sites definitely dated to the 19th century. Of the 259 given a general classification as post-medieval, most are likely to be from that century when there were a

number of changes which had a major influence on water supply, including the establishment of the system of local government which included responsibilities concerning access to and quality of water. Local water companies proliferated during the second half of the 19th century whilst technological advances, such as steam engines to pump the water and the use of hydraulic rams, also led to better supply. Growing medical knowledge and concern for the welfare of the working classes highlighted the need for such improvements.

During the earlier part of the 20th century initiatives in the provision of water continued the pattern of the previous century. Populations were growing and thus more reservoirs were constructed and water supply companies established. There was some consolidation of these into larger organisations, but the change towards uniformity of supply with centralised collection, storage and distribution was primarily a later 20th-century phenomenon. The 20th century sites include 16 reservoirs and 26 water towers. Several form part of the mains water distribution network. Another significant group of water towers is associated with the many RAF stations constructed across the county. These date from World War I onwards, and four are still in operation. At only one, RAF Brize Norton, has an extant water tower been identified, and this now lies within an industrial estate (WO174). The former RAF Upper Heyford has three water towers, one within the main airfield (CH114) and the others serving the married quarters and ancillary areas to its south (CH140, CH233).

There was significant growth in the number of public baths, swimming pools and officially recognised bathing places, reflecting an increasing awareness of the importance of exercise for health and more leisure time.

The 119 twentieth-century sites also include a group of static water tanks constructed

during World War II, mainly in case of fire. Most of these were constructed in central Oxford, within colleges and close to the Bodleian Library and Ashmolean Museum OX050-056, OX062). The fear of fire remains and a water tank was constructed at the Radcliffe Camera in 1960 (OX064).

Some of the 20th century sites consist of roadside taps, presumably regarded as easier to use than a pump or well. All but one of these is in Cherwell District, but whether this is an indication of council policy or of fortuitous survival is unknown. The final tap from this period was erected to serve a rambling route. Historic maps show that these taps were usually installed on the site of an earlier feature.

From the 21st century are two pumps: one part of a millennium project and the other supplying allotments. Both the millennium and the increasing popularity of allotments have prompted the restoration and re-use of older water features.

The number of features recorded for different periods does not necessarily demonstrate a massive expansion in their construction during the post-medieval period in places previously reliant on natural sources, but probably updating of facilities. Although evidence for continuity of use is limited – the prehistoric origin of the well at Noke (CH002) is based on pottery finds – it is extremely likely that is was very common. For a significant number of sites assigned to later periods it is likely that, as mass-production reduced the cost of pumps and with more sophisticated well technology, these features were replacing simple winch systems or helping to ease the burden of collecting water from springs. The draw well at Ledwell (WO038) was known in the 11th century (Rattue 1990, 175), but the steps and surround are probably post-medieval and a much more convenient pump (WO015) was erected alongside it later.

It is clear that the provision of water supply was expanded greatly in the later post-medieval period, for the reasons given above, and that many more features originated then. When the modern universal supply system was established in the mid to late 20th century, it really only absorbed elements such as pumping stations and reservoirs from the existing provision. Obsolete features were often left in place, although subsequent development has led to removal of many and others have undergone conversion to ornaments. However, the level of survival in rural areas particularly is surprising.

The distribution of sites by date across the seven categories (Figure 4.23) shows that before the post-medieval period evidence for supply dominates. Of the six exceptions, five are medieval, including a bathhouse and a latrine from Oxford colleges (OX057, OX061, two road drains from Oxford (OX121, OX122) and the Abbey Mill Stream in Abingdon (VW103). The final site is a Roman bath in Drayton, found on the HER (CH044).

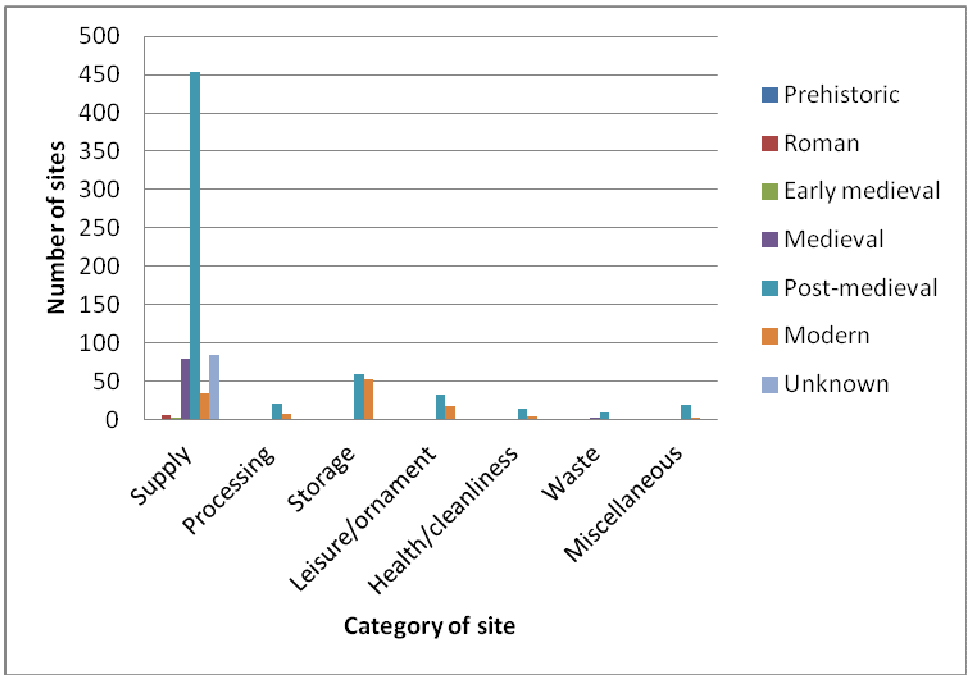


Figure 4.23: Category of Site by Date

4.3.5 Ownership and Responsibility

The features identified have been allocated to one of four types of responsibility. Some belong to or are under the control of a national or regional body, such as the National Trust or Thames Water. Others are maintained by the local authority, district or parish, which is assumed to be the position for features on roads. Many water features are in private ownership, but for others it was not possible to assign ownership, particularly for those only known from a source such as the HER. Figure 4.24 shows how the responsibility for the sites is divided.

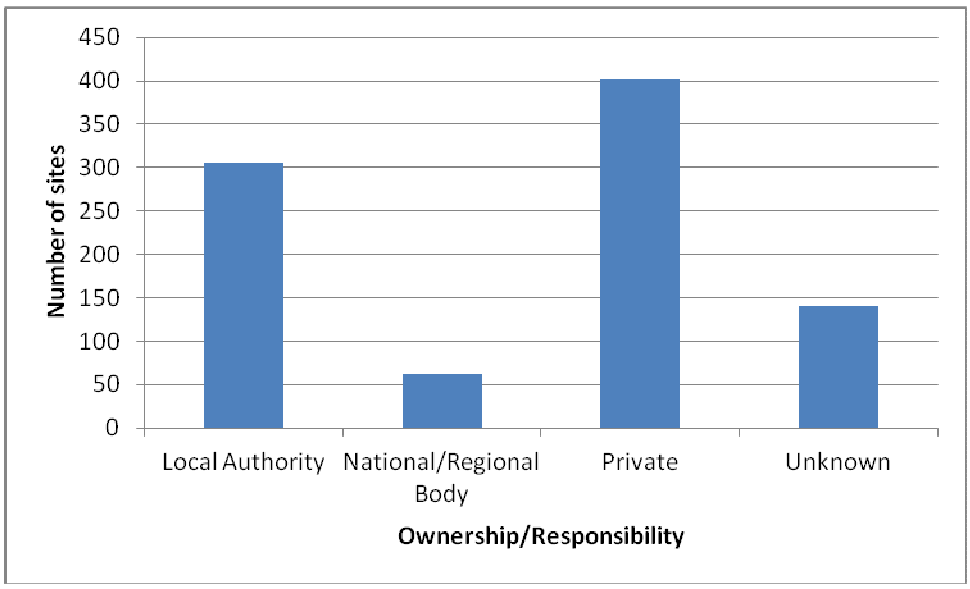


Figure 4.24: Responsibility for Sites by Type of Owner/Responsibility

Private ownership is the most common. The breakdown according to the level of designation is more complex (Figure 4.25). Three of the five Scheduled Monuments come under a national/regional body, but no Listed Buildings, apart from those part of a Scheduled site. All of the Registered Parks and Gardens are in private ownership. Unsurprisingly, all of the sites of unknown ownership fall into the undesignated category.

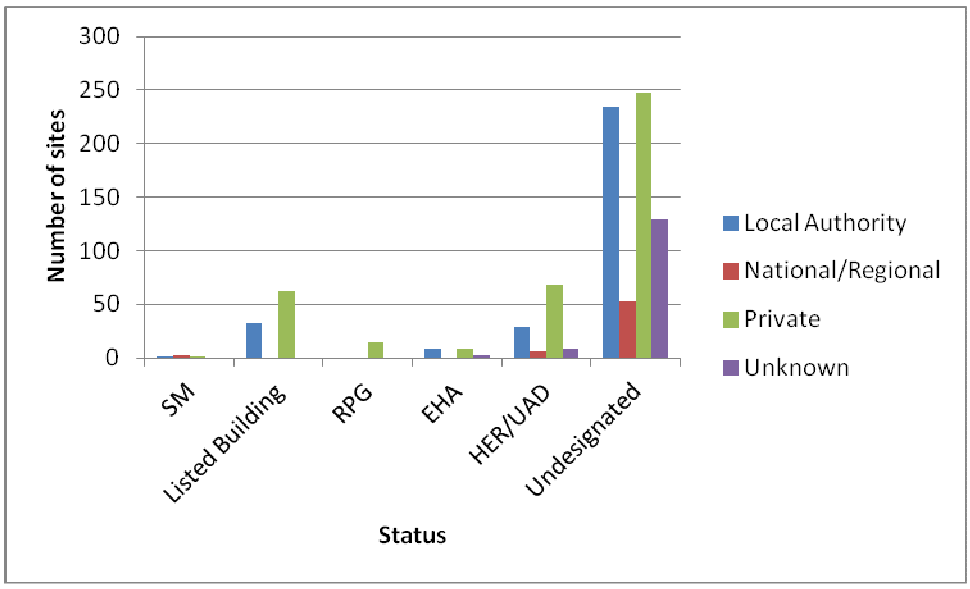


Figure 4.25: Responsibility for Sites by Designation Level

4.3.6 Condition

An assessment was made of the condition of each of the sites identified. This contained six categories:

Score 1: 80% or more original condition, in working order;

Score 2: 80% or more original condition, not in working order;

Score 3: 40 – 80% original condition;

Score 4: <40% original condition, seriously compromised, original location;

Score 5: Fragmentary remains, location only, related features;

Score U: Unknown – unknown level of survival, imprecise location, not accessed.

The spread of results suggests that designation does not carry any guarantee that a site will be well-maintained. It is not possible to draw many conclusions about scheduling based on five sites, one relating to an excavation (CH032). Only one is in working order, the donkey-wheel well at Greys Court (SO006), although it is only used as part of the

visitor experience. It is encouraging that only one Listed Building relating to water, the well-house at Wick Farm, Beckley (SO042) appears on the Heritage at Risk register compiled by English Heritage. This scored 2 for condition, based on the results of an exterior and interior survey (Julian Munby pers. comm.). For the sites scoring 4 or 5, the feature has been moved or completely stripped of the element relating to water supply However, some of those scored at 3 are in poor condition and appear vulnerable to further decay, such as the pumps in Drayton (VW015, VW050).

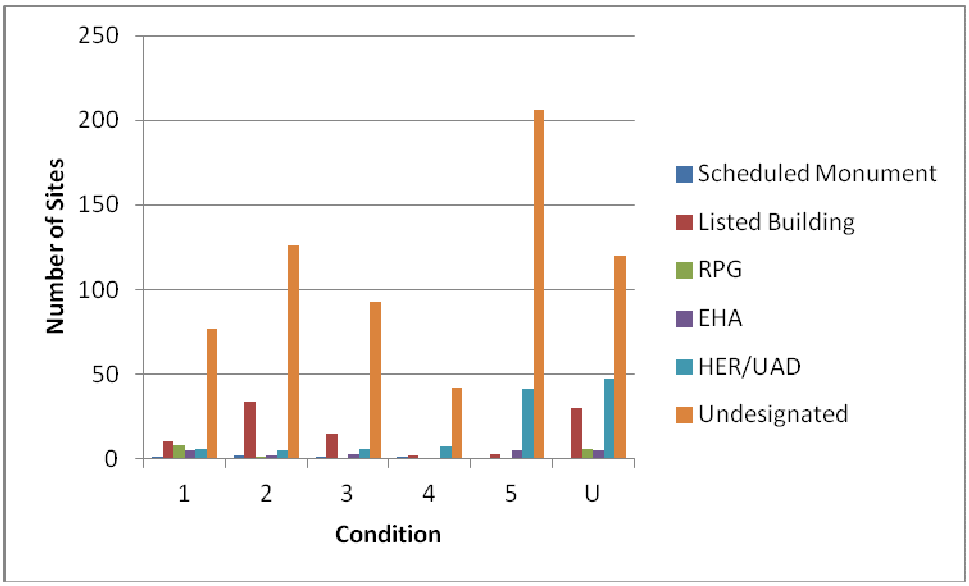


Figure 4.26: Condition of Sites by Designation

When the condition of the sites is analysed with respect to the type of owner or responsible body, the national/regional bodies hold a significant number of working features scoring 1, mainly Thames Water storage or processing sites.

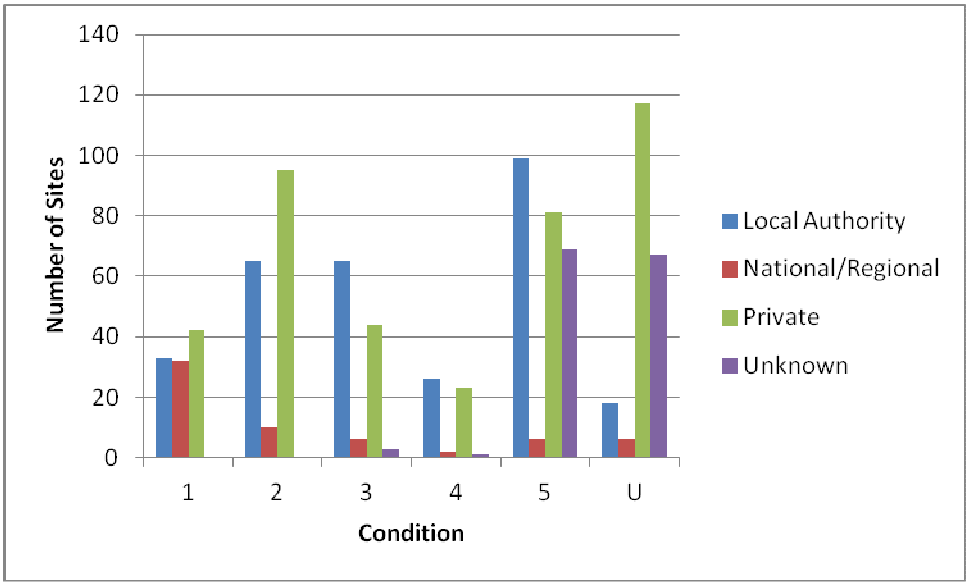


Figure 4.27: Condition of Sites by Type of Ownership/Responsibility

For sites of unknown condition, predominantly those which could not be accessed, most belonged to private owners. Access was not deliberately sought to private property, and such sites were not visited unless there was already some personal contact, through a local society or friend for example, or the site was open to the public, for example parts of Oxford University, or it was visible from a public right of way. Sites with unknown owners, often those for which only a passing documentary reference has been recorded, are mainly confined to the lowest condition categories as would be expected.

Private owners are responsible for a higher proportion of the sites scoring 1 or 2 for their condition. The relationship between the condition of a site and an individual or group becoming actively involved in its upkeep or restoration is discussed in Chapter 7.

4.4 Thematic Studies

4.4.1 Limitations of Oxfordshire resource

Little has survived in Oxfordshire of the larger Victorian and Edwardian waterworks, either preserved as working museums or in use with appropriate alterations. The best preserved is the Hinksey Waterworks site (OX019) in Lake Road, Oxford, which is now a Community Centre, with its smaller outdoor reservoirs converted into swimming and paddling pools. The lake itself, the largest reservoir, has survived. Henley's Waterworks are part of the Thames Water system, but were never especially large. The late 19th and early 20th century waterworks sites along the Thames nearer to London can still be seen and, closer to the county, Dancers End Pumping station in Buckinghamshire (BU004) forms part of the Thames Water network.

Despite the ubiquity of mineral springs across the county, Oxfordshire was never, as already discussed, known for spas. Nothing remains on show at the one site identified as a Cold Bath in Watchfield (VW046) or of the selling of mineral water in Caversham (BE002). Several brewers also supplied mineral water in the past, but today the only local production comes from the Blenheim estate (WO187). Of the holy wells identified by Rattue, there are rather more survivors (see Chapter 5).

4.4.2 Open and Closed parishes

One of the research questions for this study was the relationship between water supply and social organization. A particular issue is whether there is any difference in provision between open and closed parishes, as described in a previous section. In order to test this, a subset of sites was identified for closer study. The 264 sites were all from Category A, water supply, and all from the post-medieval or 20th century periods. In each case the feature was either in a publicly accessible location or within domestic premises. In the latter case, some were clearly provided for communal use and all would have been

provided by or with the consent off the landowner. The results for the three different types of parish are given in Figure 4.28 below and mapped in Figure 4.29.

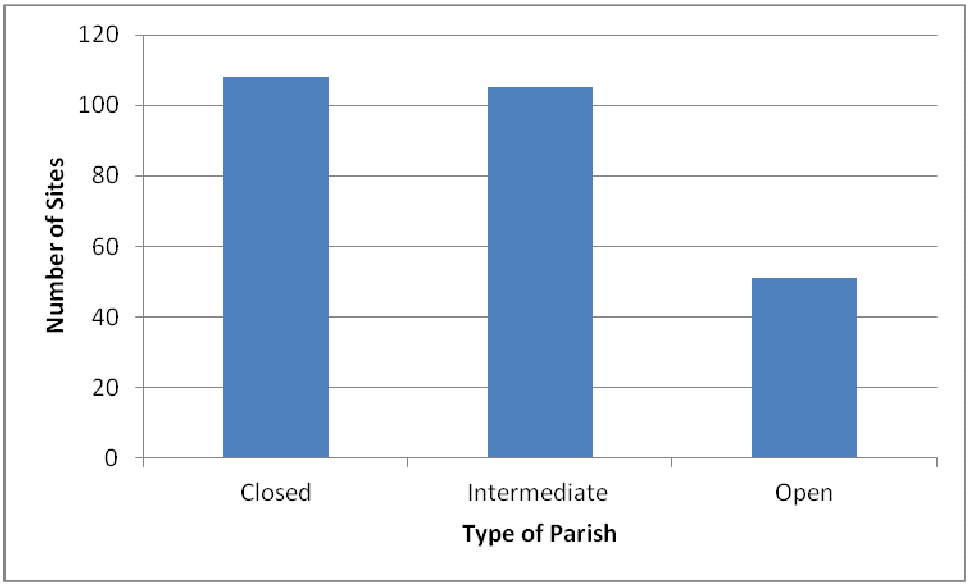
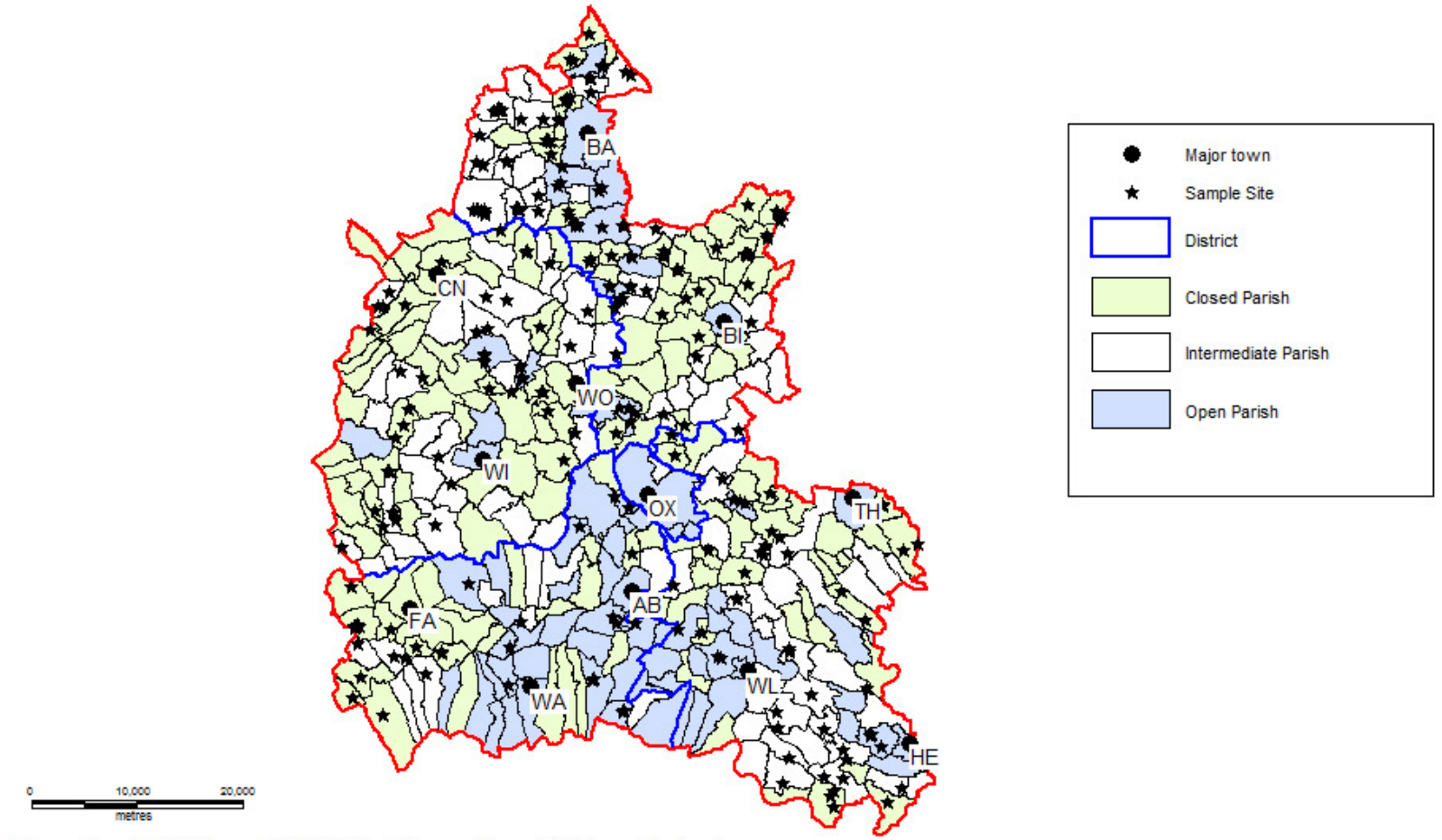


Figure 4.28: Distribution of Water Supply by Type of Parish

These results suggest that the inhabitants of closed parishes did not have better access to water supply than those in open parishes. Intermediate parishes seem to have been the best served.

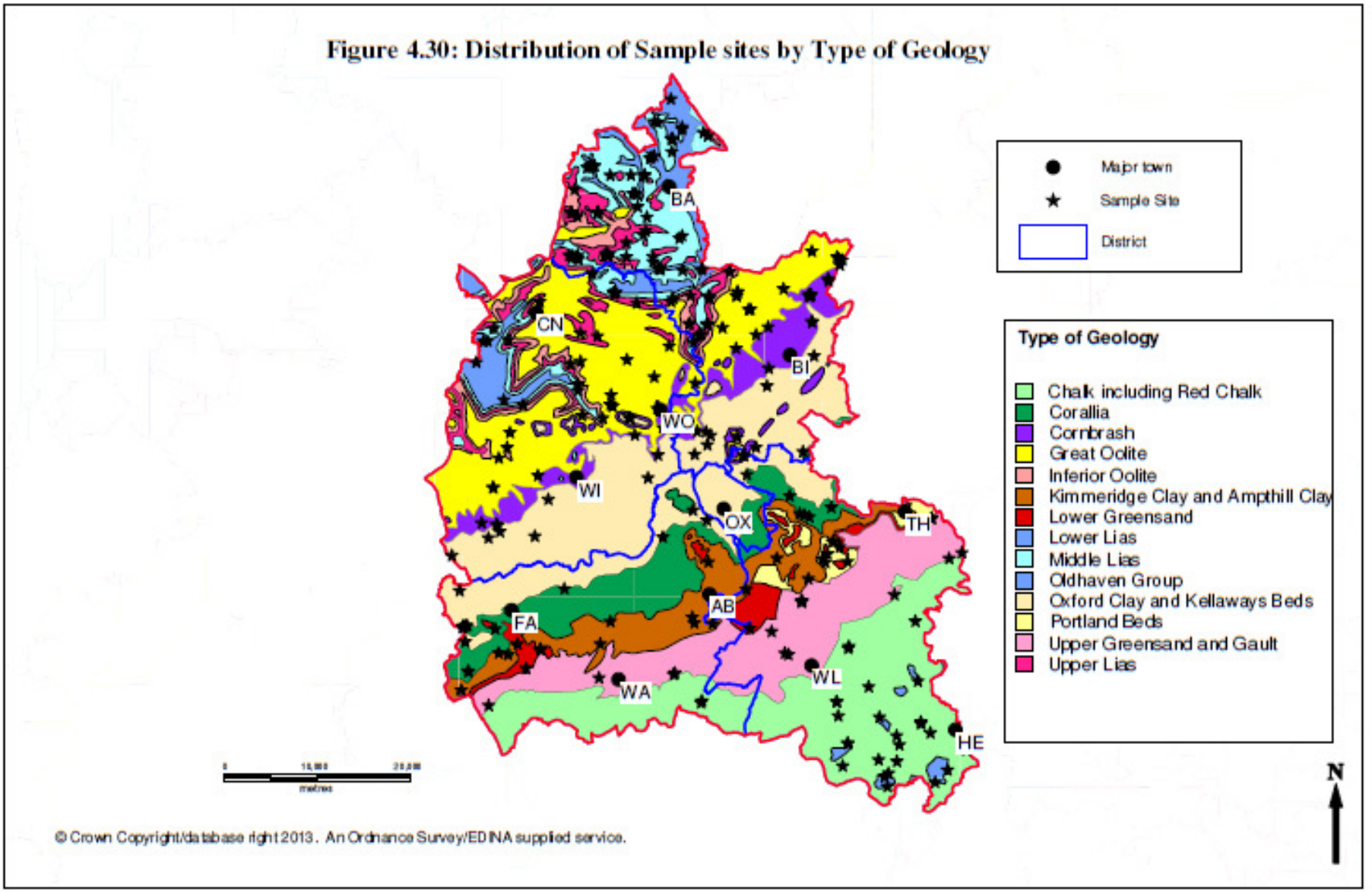
It is possible that others factors such as geology may have had more effect than social organization. However, when the distribution is plotted against geology (Figure 4.30) the bias in favour of closed parishes is strong for clay and limestone geologies. The numbers on chalk or sand are generally low.

Figure 4.29: Distribution of Sample Sites by Type of Parish



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Figure 4.30: Distribution of Sample sites by Type of Geology



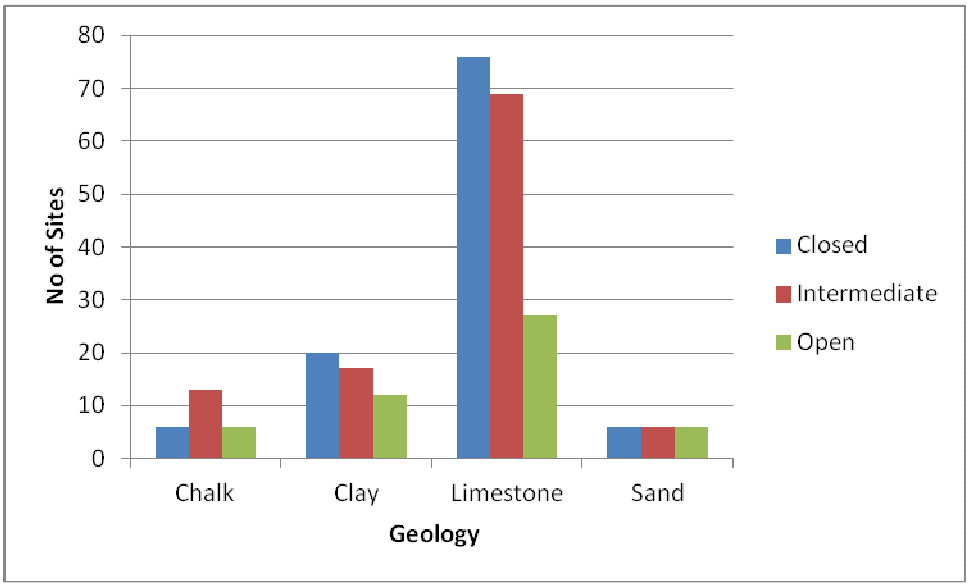


Figure 4.31: Water Supply across Parish Types by Geology.

The bias towards closed parishes is very clear for limestone areas and positive for clay areas. However, it is not clear for chalk and sand, although the combined totals for closed and intermediate are always greater than for open parishes. No attempt has been made to analyse the location of sites in intermediate parishes in relation to the detail of land holdings at parish level, although a number of sites in intermediate parishes are known to have been paid for by local aristocracy or gentry families, in Spelsbury (WO018, WO058) and several parishes in South Oxfordshire (SO119, SO190) for example.

Other factors which may affect this distribution are the impact of towns, uneven levels of survey and the difference in how the parish classification was arrived at in some cases. The restricted sample used for this analysis does not include Oxford City, where different mechanisms operate, or the key historic towns within each district: Thame, Henley-on-Thames, Banbury, Witney, Abingdon, Wantage. This restriction should address the first

point.

A separate analysis was carried out for the Cherwell sites. This District was the subject of a systematic programme of field visits involving all its settlements, providing an even basis for comparison. The results show a clear bias away from open parishes.

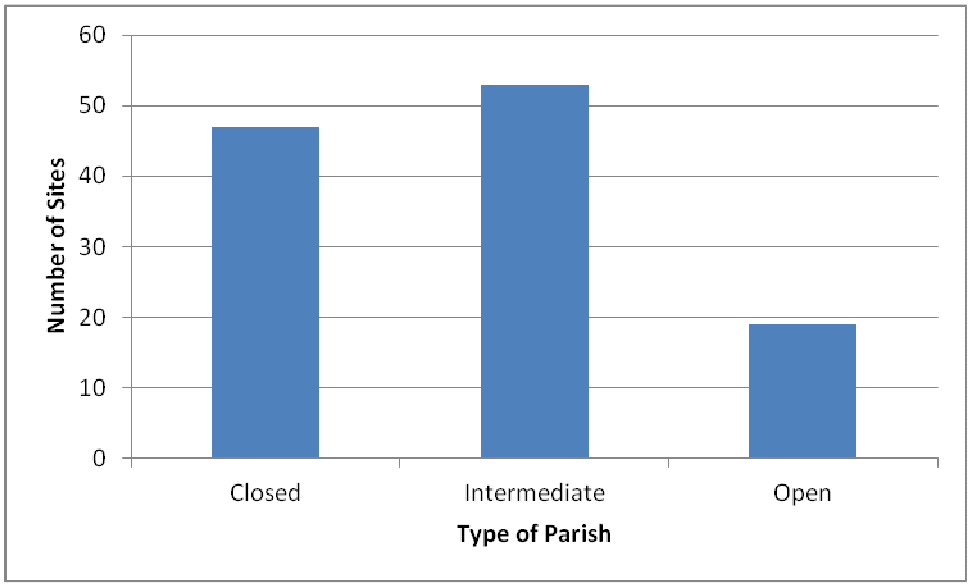
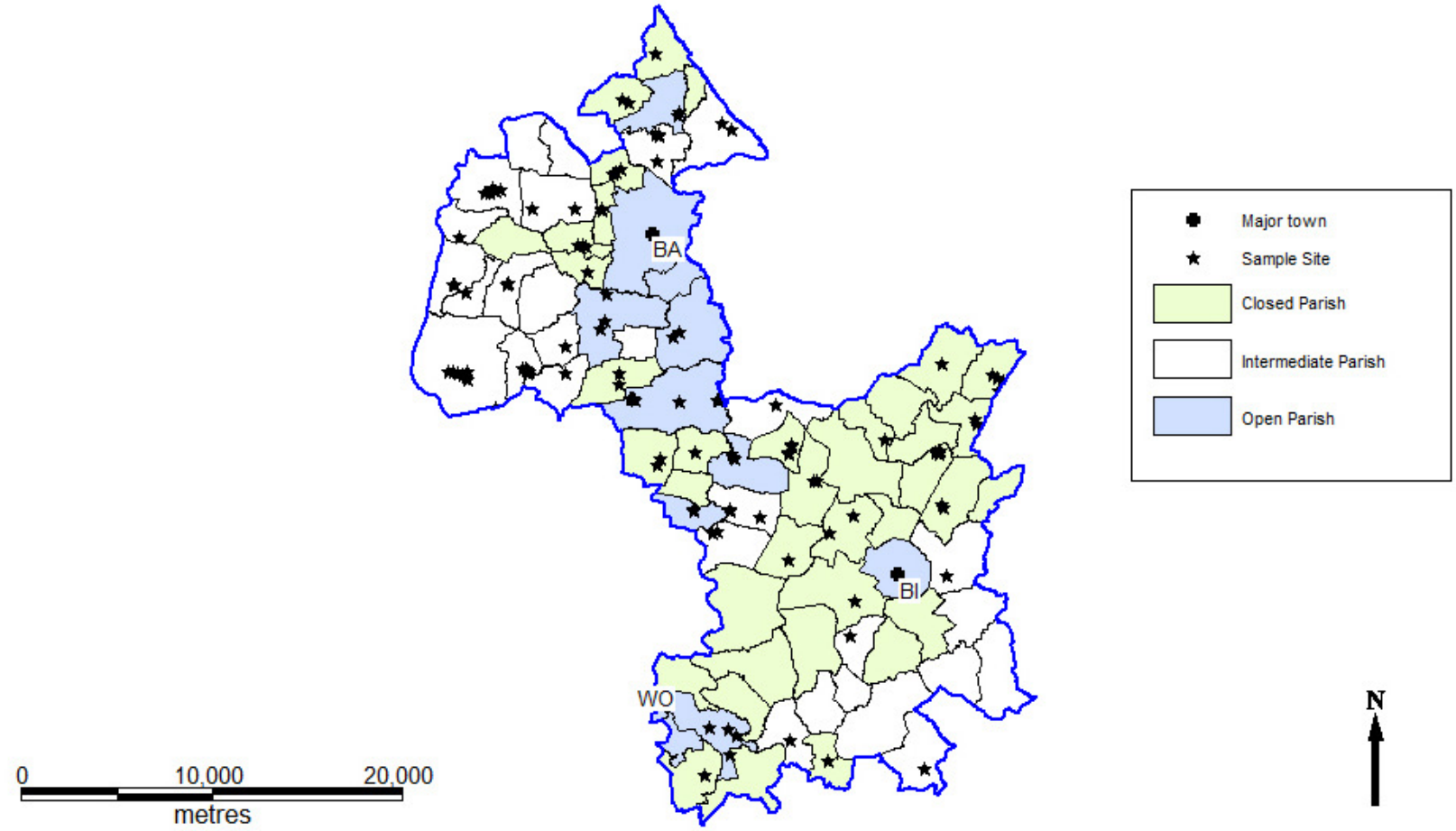


Figure 4.32: Distribution of Sites by Type of Parish in Cherwell

The distribution of sites is mapped in Figure 4.33.

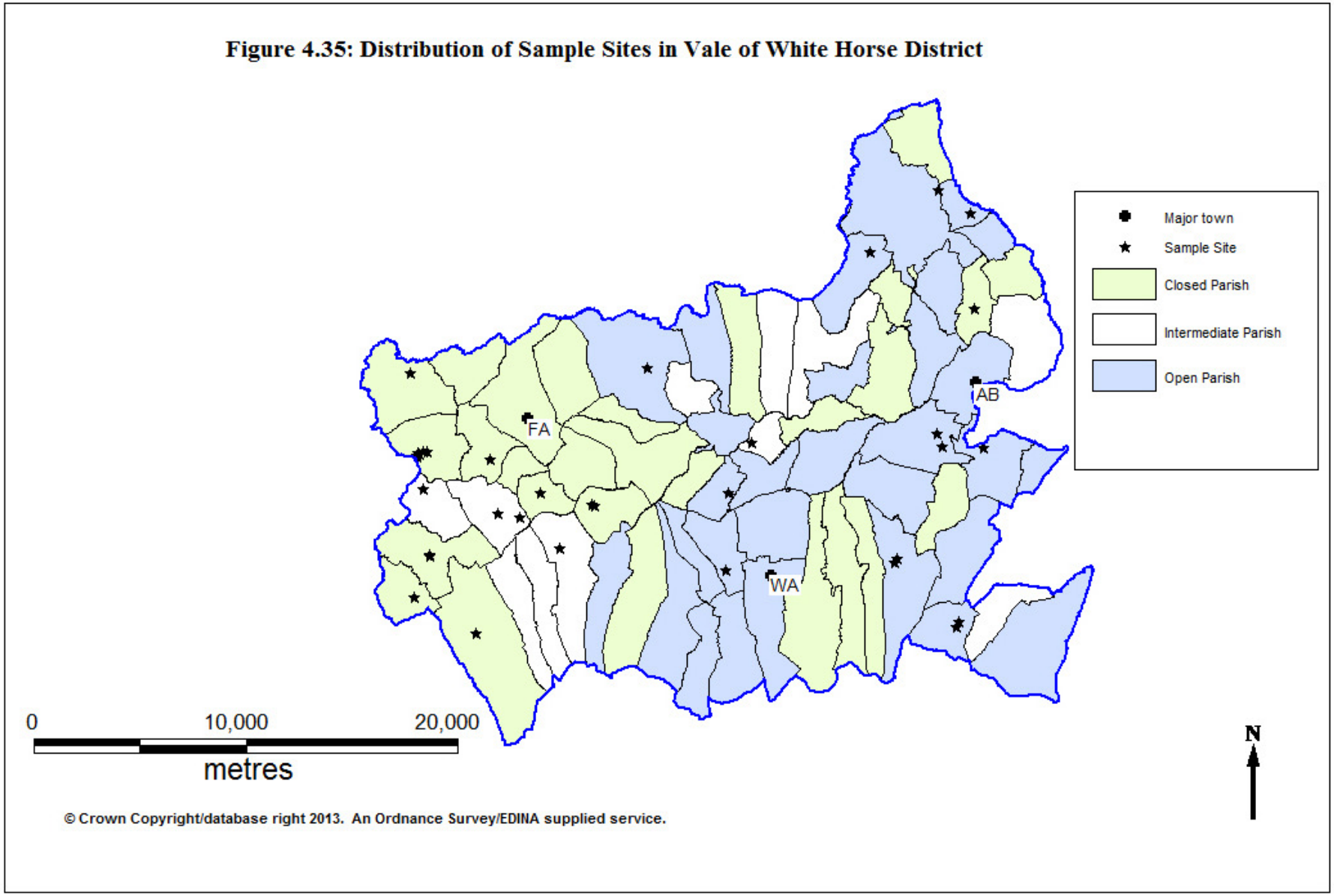
The breakdown by district follows this pattern for West Oxfordshire and South Oxfordshire, but not for the Vale of the White Horse (Figure 4.34. 4.35). For that district the results still show most sites in closed parishes, but there are more in open than intermediate parishes. The obvious reason for this would be the approach used in assessing these parishes, which was fairly crude and did not make the identification of intermediate parishes easy. It is unlikley that the difference arises from the fact that this area, like parts of South Oxfordshire, was part of Berkshire until 1973.

Figure 4.33: Distribution of Sample Sites in Cherwell District



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Figure 4.35: Distribution of Sample Sites in Vale of White Horse District



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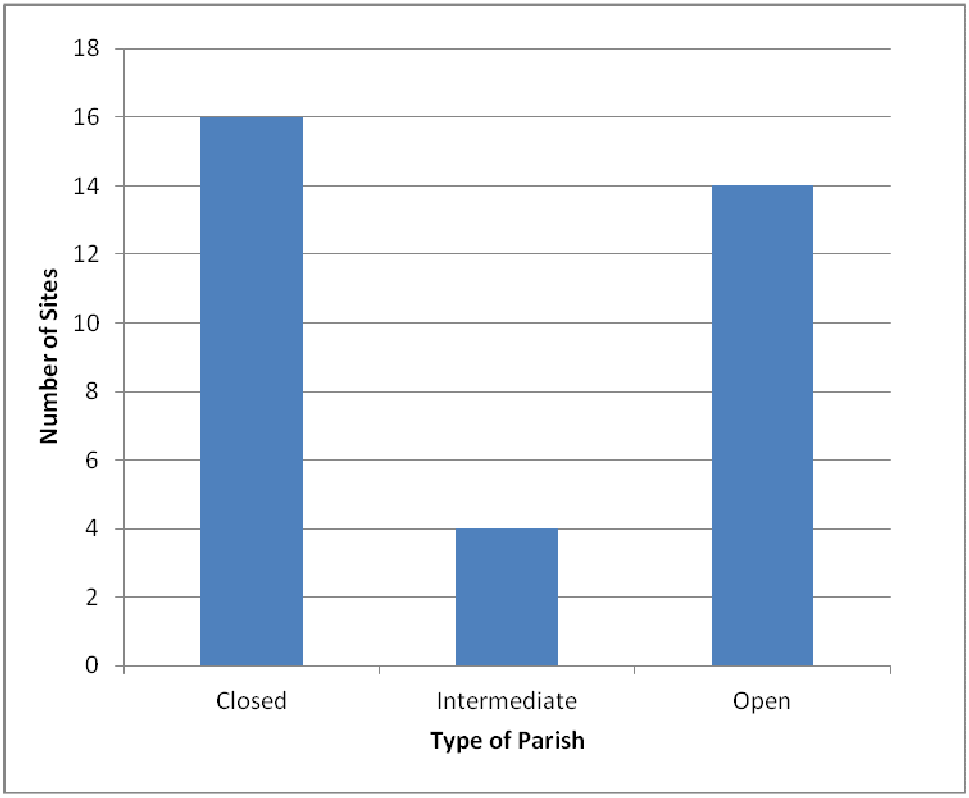


Figure 4.34: Distribution of Sites by Type of Parish in Vale of White Horse

Overall the evidence indicates that the provision of a water supply was better in a closed or intermediate parish than in an open parish. It does not, however, mean that the larger landowners or local gentry were always concerned with the conditions under which their tenants, and often employees, lived. The differences between different types of parish are explored in Chapter 5, which looks at specific examples.

4.4.3 Manufacturers

Many pumps are not clearly marked with the name of their manufacturer and few catalogues have survived to assist in identifying the correct one. This process is complicated by the similarity in recorded designs. However, by combining the markings on Oxfordshire examples with previous research work (www.villagepumps.org.uk) it is possible to assign many of the pumps to a particular manufacturer, with varying degrees

of certainty (Figure 4.36). Examples are shown in plates 4.1- 4.4.

The two most common manufacturers represented were Lee Howl and Joseph Evans. Models from these two companies often had a distinct similarity in design, making them difficult to distinguish and leading to possible misattributions. One particular design has been identified in numerous locations across Oxfordshire, the vast majority in Cherwell and in West Oxfordshire and in the Vale of White Horse. Some of these can be assigned definitely to Evans e.g. in Ardley (CH026) and Hook Norton (CH175), and others to Howl, such as those in North Newington (CH049, CH050, CH161). It appears that Howl products were more common in Cherwell and Evans' in West Oxfordshire and Vale of White Horse.

Joseph Evans & Sons (Wolverhampton) Ltd., was founded in 1810, acquired by Newman Industries in 1944 and traded until about 1964. It was probably the most prolific manufacturer in Britain, followed by Lee Howl. Lee, Howl, Ward & Howl was established in Tipton, Staffs, in 1880, and from this emerged in 1887 the firm of Lee, Howl & Co (www.villagepumps.org.uk).

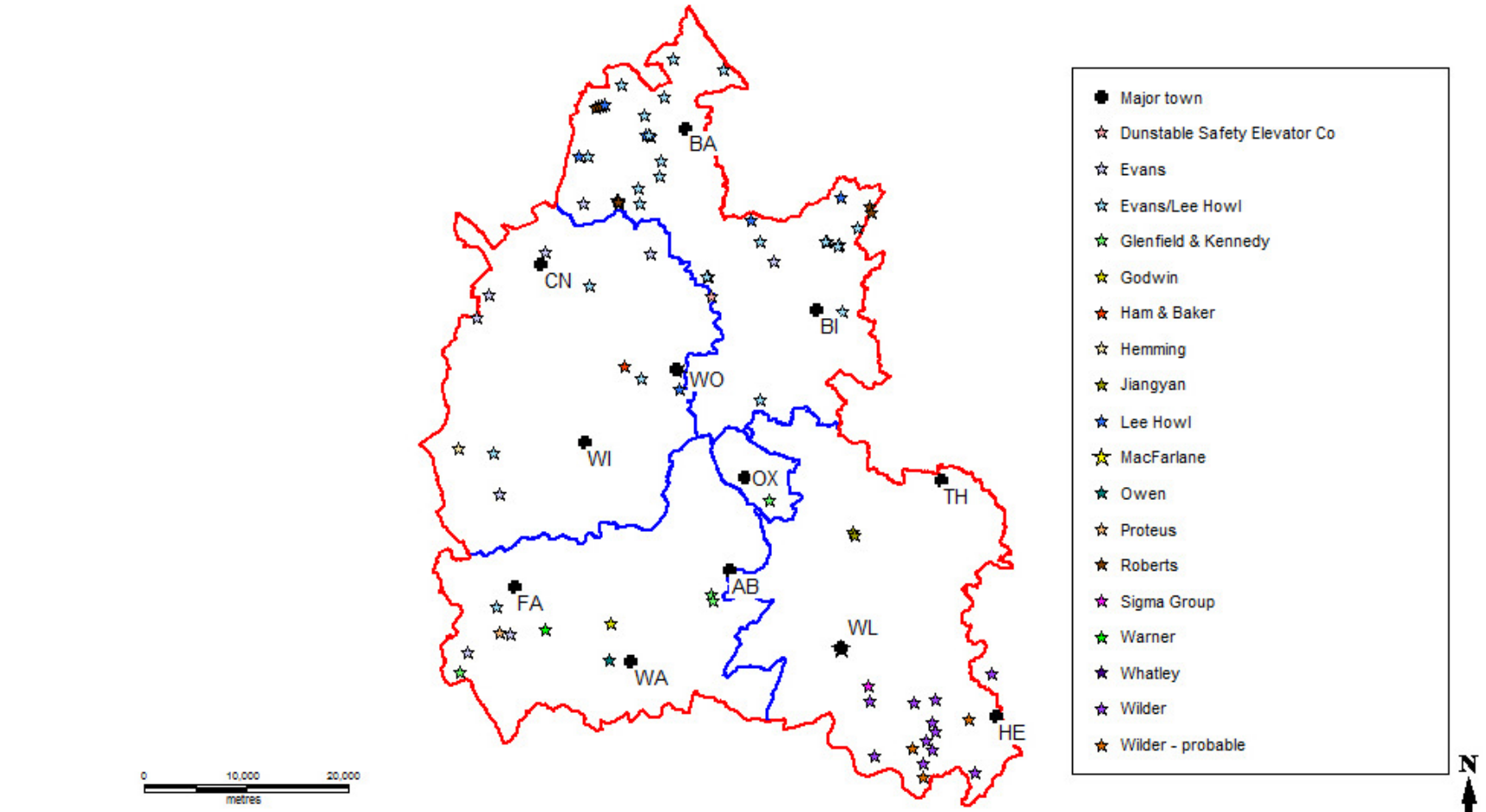
Some examples of the work of both companies can definitely be identified. Evans produced the pumps in Kingham (WO039), Foscot (WO199), Alvescot (WO169), Ledwell (WO015) and Over Norton (WO016), all in West Oxfordshire, while Howl products survive at Souldern (CH017), Sibford Gower (CH52), both in Cherwell, and Bladon (WO020) in West Oxfordshire.

Other manufacturers represented by Oxfordshire examples include several from London:

Warner: Baulking (VW052);

Owen: East Challow (VW021);

Figure 4.36: Distribution of Products of Known Manufacturers



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Middleton: Coleshill (VW083);

Ham and Baker: Hethe (CH058), Stonesfield (WO010).

Warner pumps seem to have been used mainly in the Vale of White Horse. In the south of the county are several examples of pumps from Glenfield and Kennedy of Kilmarnock, in which the water emerges from a lion's mouth. These are really more taps than pumps and were used in communal water supply systems, such as one in Bedfordshire (BD001) and another at Ashbury. Although the reservoir and pump house are still in existence, no roadside taps survive in Ashbury, but there is one in nearby Bourton (VW014). There are two in the adjoining village of Drayton and another, converted for mains supply, serves Rosehill Cemetery in Oxford (OX080). The village supply is discussed in Chapter 5.

There are even two old pumps from overseas manufacturers. In Ipsden churchyard (SO117) is a pump made by Sigma in Czechoslovakia while Longcot (VW072) has a German Proteus. The two new pump in Little Milton (SO050 and SO051) are copies of old designs, probably made by the Chinese company, Jiangyan Fashion Machinery Manufacturing Co. Ltd (www.handpump.com.cn).

There are some pumps of more local manufacture, although few made inside the county itself. The pump on the green at Shrivenham (VW024) came from Whatley & Co of Pewsey, Oxfordshire and Denchworth's (VW022) from Godwin of Quenington, Gloucestershire. In Shenington there are several pumps (CH062, 123, 124, 223) made by D E & H Roberts of Deanshanger, South Northamptonshire and there are two more in Finmere (CH009, CH010), on the border with that county. One unusual example, in Rousham village (WO023), was made by The Safety Water Elevator Co, Dunstable, effectively a bucket chain system (www.villagepumps.org.uk). The pump at Holwell (WO104) was made by Hemming of Burford, established in 1840.

Usually wells' manufacturers cannot be identified, but in South Oxfordshire and neighbouring parts of Buckinghamshire, there are numerous examples made by Wilders of Wallingford. The company was very involved in digging and fitting out wells, as part of their very successful foundry and engineering business (Dewey & Francis 1983, 19). They were able to produce ornamental ironwork as well as mechanical parts, and the ornate canopy of the Maharajah's well in Stoke Row is their work. Interestingly, the drinking fountain in Wallingford, donated by another local businessman, was purchased from the stock catalogue of Walter MacFarlane of Glasgow, thought to be the biggest manufacturer in the field of architectural ironwork (The Scottish Ironwork Foundation 2006, 19). The choice was probably driven by cost, the Scottish company keeping ornate designs as regular stock. The distribution of known and probable Wilder wells is shown in Figure 4.37.

There is not necessarily a relationship between the locations of the manufacturer of a pump and where his products have been used. Apart from the case of Wilders of Wallingford the number of examples from a particular, very local, supplier is low. There does appear to be some grouping in the evidence from larger manufacturers, perhaps arising from one good salesman covering an area. Cost was obviously a consideration, demonstrated in Wallingford, but price data were not available.

4.4.4 Design

Most pumps have a fairly functional design, the later mass-produced versions displaying limited variation across the different manufacturers. The lion's mask used by Glenfield and Kennedy is unusual. When wells and structures enclosing both wells and pumps are considered, the designs reflect wider trends in architecture and interior design.

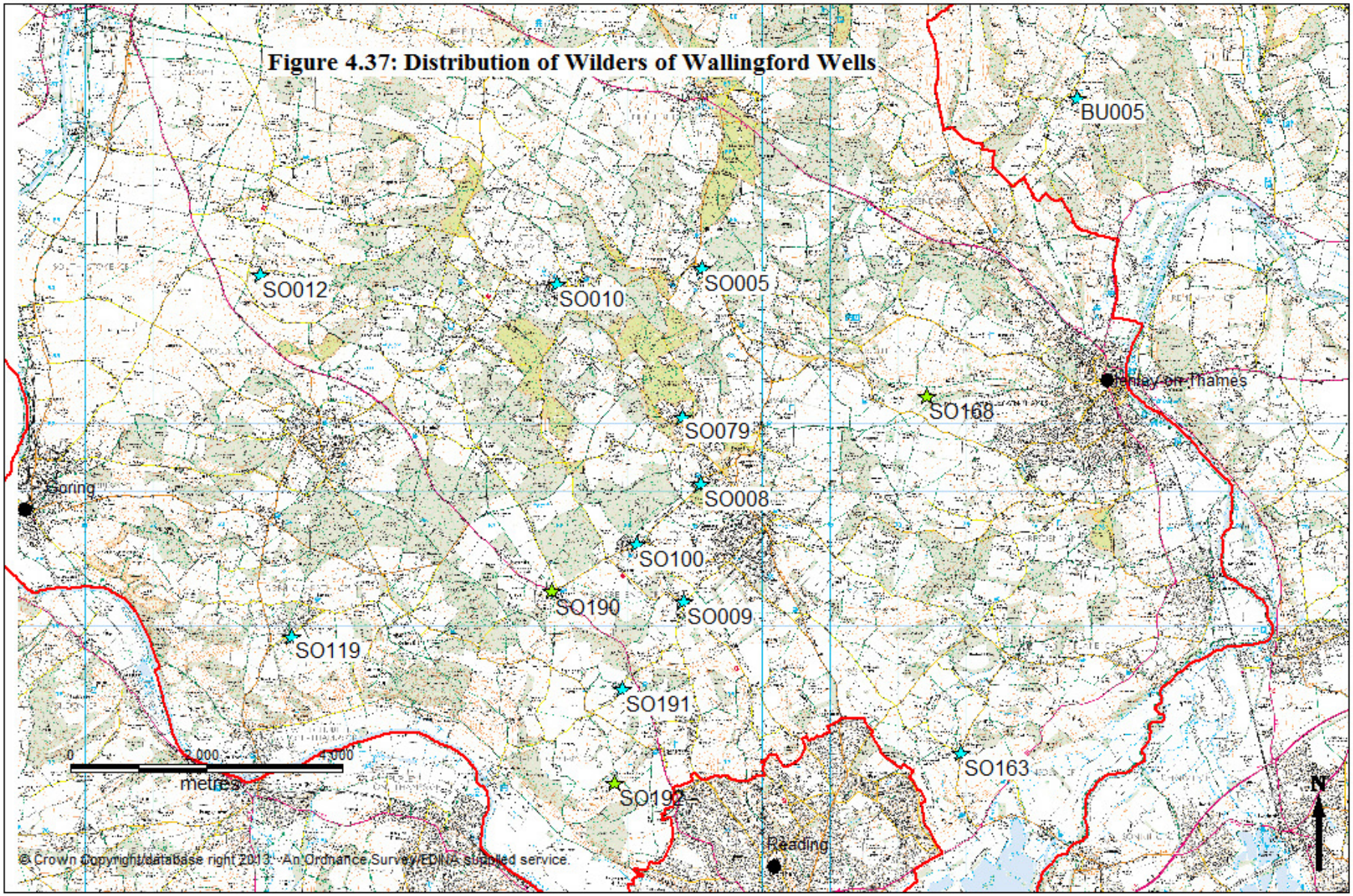


Figure 4.37: Distribution of Wilders of Wallingford Wells

A number of features are in Gothic style, which was used for the Carfax Conduit (SO025) in 1610. The Langston Memorial Fountain in Churchill (WO017) (Plate 4.5a) from 1870 appears to have been strongly influenced by the earlier feature in its design. Other examples of Gothic style can be seen in the 1895 roadside drinking fountain in Church Enstone (WO012), the 1862 Dillon Fountain (WO058) at Taston (Plate 4.5b) and in Henley (SO014). The Phillimore Fountain is more ornamented, a good example of Victorian Gothic revival design.

Baroque designs have also been identified, at Over Norton (WO016) for example (Plate 4.5c). If the engravings of the Oxford first public baths (OX088) were realised, then the buildings had Baroque features such as the domes over the wings. Baroque designs have been utilized for the bath house at Heythrop Park (WO138) from c 1710 and the well house at Wick Farm, near Beckley (SO042), which dates from the late 17th or early 18th century. The bath house at Heythrop was built at the same time as the house and in the same style (Mowl 2007). Wick Farm was then in the possession of the Walter family, who also held the Sarsden estate. In 1685 William Walter rebuilt Sarsden house, which has been altered since, and an engraving of this building by Kennett (1695) shows a pair of *oeils de boeuf* windows flanking a relief, a motif which also appears on the well house (Baty 2012). A later example in this style is the Walton Well fountain (OX013) Oxford (Plate 4.5d), erected in 1885. In Spelsbury (WO018) the design seems to incorporate both Baroque and Arts and Crafts elements (Plate 4.6a).

Buildings in the Arts and Crafts style, developed in the 19th century and utilizing vernacular materials and local traditions, are more common. Several of the Wilder wells discussed above have simple square pyramidal roofs, including those at Kidmore End, Gallowstree Common, Rotherfield Grays and Dunsden. The same style has been used in St Clements, Oxford (OX005), Fringford (CH057) and Bladon (WO020) as well as for

the pump built to serve the 1930s council houses in Warborough (SO056) (Plate 4.6b).

Interior decoration more often than architecture illustrated less durable fashions, such as the interest in India which influenced the Royal Pavilion in Brighton and rooms in Osborne House created for Queen Victoria. The Maharajah's Well (SO010) follows this fashion, although the carving of an elephant above the spring in Spring Wood, Rotherfield Peppard (SO078) has a later origin (Plate 4.6c). Egypt also had an influence on fashion, mainly following the success of Nelson's campaigns there against Napoleon. Interest revived in the early 20th century when the tomb of Tutankhamen was discovered. None of Oxfordshire's water sources shows evidence of this style, but there is an Egyptian Well (BU003) at Hartwell House, Stone, c 12 km west of the Oxfordshire border (Plate 4.6d).

4.4.5 Holy and Healing Wells

There are 151 wells and springs which have been suggested as possible holy or healing wells, or have clear early origins (see Chapter 5). The majority of these sites were identified by Rattue (1990, 1992), but he uses the pre-1974 county boundary and omits the Vale of White Horse and some parts of South Oxfordshire. Some examples from these areas have been identified, but no systematic identification work was carried out. The distribution of these early sites across the districts is given in Figure 4.39, including St Anne's Well, Caversham (BE001), formerly in Oxfordshire but now in Berkshire.

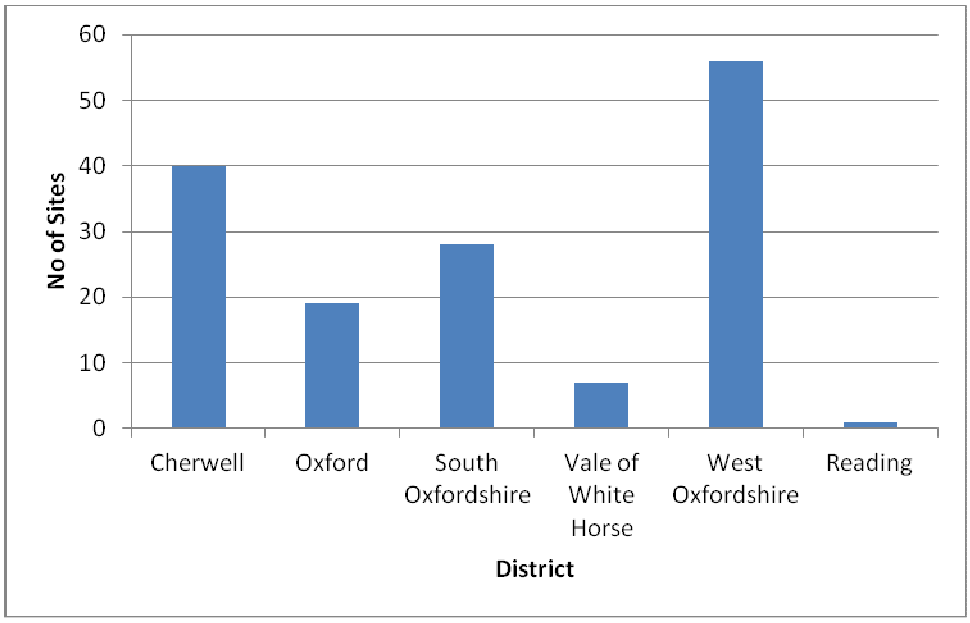
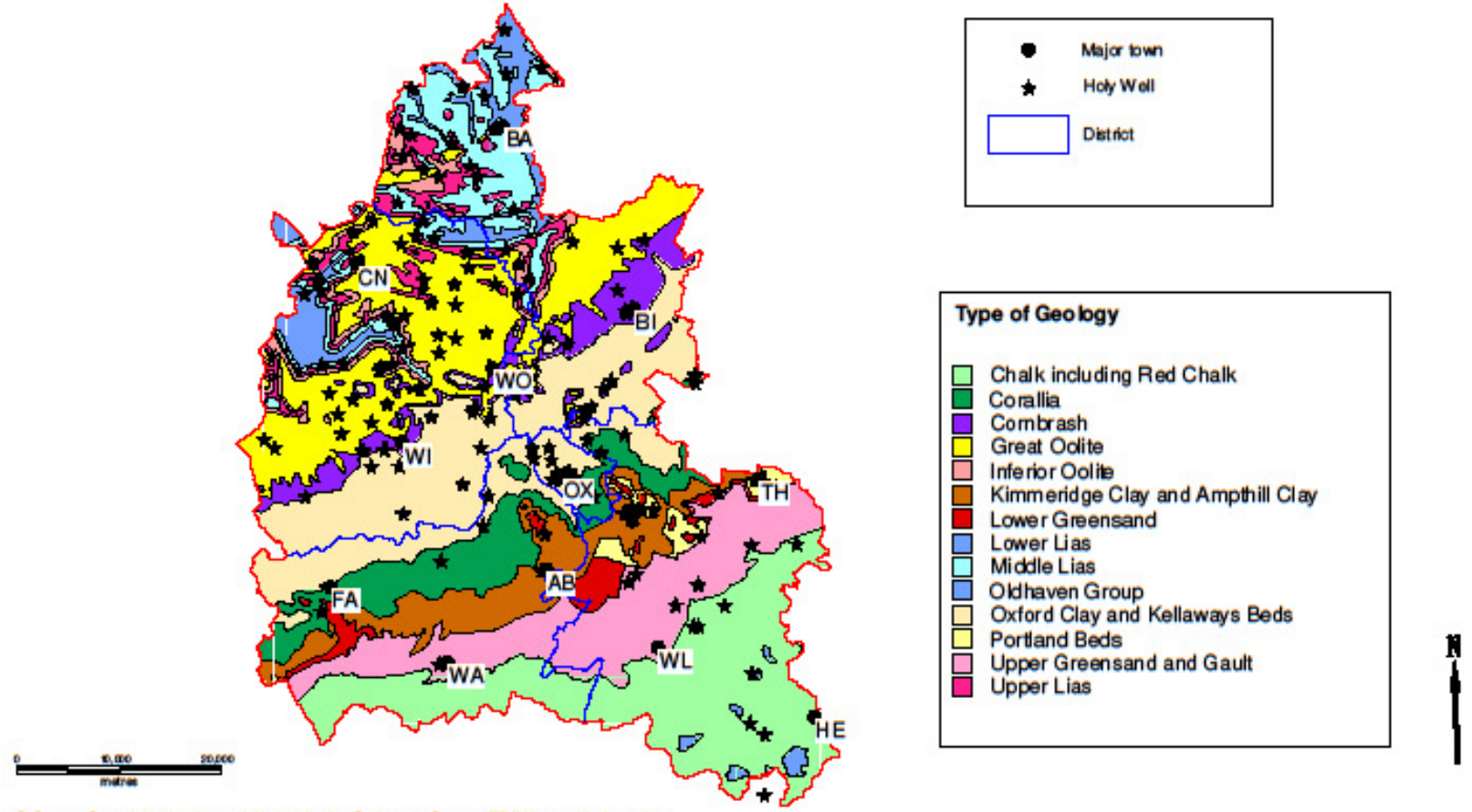


Figure 4.38: Distribution of Holy Wells by District

The low figure for the Vale of White Horse arises mainly from the lack of research at the level employed by Rattue across the rest of the county, but also the extent of chalk geology across the district. As discussed in Chapter 3, the natural springs do not emerge through chalk. There are also fewer sites in South Oxfordshire, which also has significant areas of chalk. Limestone provides the most suitable geology. The distribution is mapped in Figure 4.40.

Figure 4.40: Distribution of Holy Wells by Geology



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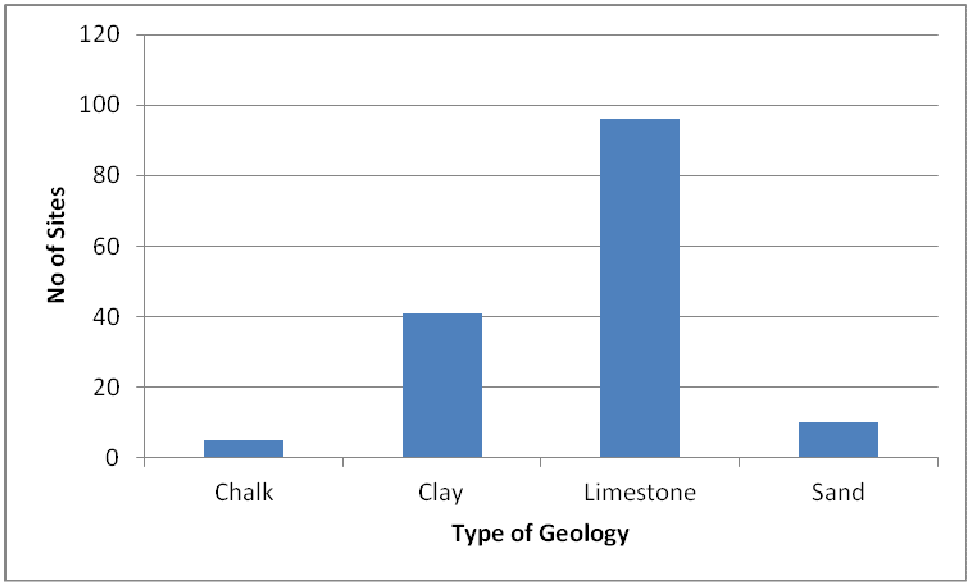


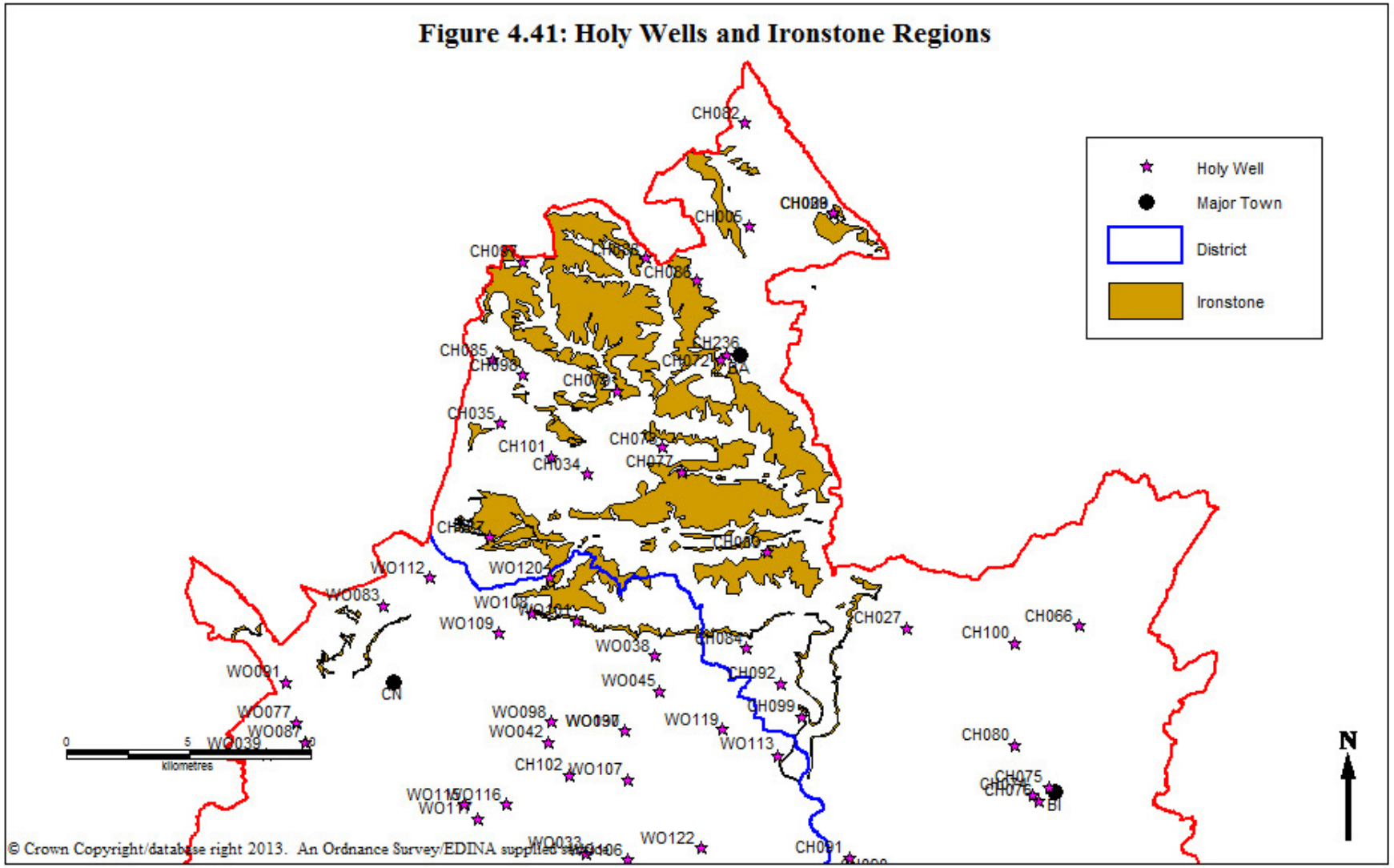
Figure 4.39: Distribution of Holy Wells by Type of Geology

A number of the holy or healing wells have been described by Tiddeman (1910) and Plot (1677) as chalybeate, that is containing iron salts. In the northern limestone areas of Oxfordshire there are extensive ironstone deposits, as shown on Figure 4.41. However, of the seven chalybeate wells identified, only three lie on the ironstone: Godswell, Bloxham (CH077); Robber's Well, Hook Norton (CH087); Holy Well, Great Tew (WO101). Ironstone contains predominently oxides of iron which are largely insoluble in non-acidic conditions, possibly reducing the mineral content of the local water. The mineral content of chalybeate springs, and their reddish colour, are associated with iron carbonate.

4.5 Summary

Oxfordshire is a county with a range of geologies. While the majority of the county is characterised by arable farms, nucleated settlement and formal parkland, there are also areas of more dispersed settlement, on the edges of the Cotswolds in the north-west, on the chalk downlands in the south of the county and in the wooded areas of the Chilterns in the south-east. The relationship between landscape character and water supply suggests

Figure 4.41: Holy Wells and Ironstone Regions



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a number of themes, explored further in Chapters 5-7, including differences in supply in open and closed parishes and the impacts of park creation.

Sufficient examples of features associated with water supply have been identified across the county to allow patterns of distribution, levels of designation, ownership and condition to be explored. These statistics have demonstrated that geology is one of the most important factors governing the availability and quality of supply, including the incidence of early holy and healing wells. Changes in supply over time can also be discerned.

In addition the designs of post-medieval water sources identified show the influence of broader trends in architectural styles. It was not possible to assign a manufacturer to all the features identified, but it was possible to begin to identify some patterns in distribution.

5 WATER IN RURAL SOCIETIES

5.1 Introduction

The bulk of this chapter is concerned with structures which survive or for which there is reliable documentary evidence of their existence. The level of survival of particular features is not a major concern, except in respect of the relationship between it and its setting and inhabitants. The emphasis is rather on how the supply was organised in relation to the community it served, variations in access across different levels of society and who had responsibility for provision, maintenance and access.

5.2 Open and Closed Parishes

As described in Chapter 4, by the 19th century patterns of landownership across England had led to the emergence of two classes of rural parish: open and closed, although in practice a third category, intermediate, is used where it is difficult to allocate a type to a parish or there is a mix of settlements within it (Byung Khun Song 2002, 205).

Houses tended to be better built and maintained in closed parishes, particularly those where the village had been rebuilt, relocated or created as a model village to enhance the appearance of the landscape around the estate. It is not entirely clear that the better quality housing of the closed parishes reflected a genuine concern for the well-being of their tenants. This study attempted to investigate if evidence exists as to whether landowner control extended to the water supply and whether there are any identifiable differences between the facilities in open and closed parishes. The statistical analysis in Chapter 4 suggests that provision of access to water was better in the closed and intermediate parishes, although more detailed study of the position in the last category is required.

There have been several detailed studies carried out on individual parishes or groups of parishes, but water supply does not generally feature prominently in these. This section contains a number of case studies illustrating differences between the types of parish. The presence of streams and ponds which relieved any necessity for other provision to be made is also considered.

5.2.1 Hook Norton

Kate Tiller has produced a detailed discussion of the open village of Hook Norton, Oxfordshire, which straggles along the banks of a stream valley. Water was obviously plentiful and the village is still dominated by its brewery, which has its own well (CH176) and water tower (CH246). There were four tites (Figure 5.1), places where springs reached the surface before emptying into the river (CH054, CH063, CH122, CH172) at which villagers could collect water. Photographs held at the Hook Norton Museum show that pumps were added to some of these tites (CH063, CH172) (Plate 5.1a). Mains water arrived in 1955 (Tiller 2000, 279), when the tites were sealed off despite opposition from the local population (Curator Hook Norton Museum 2009, pers. comm.) .

5.2.2 Headington Quarry

Water supplies feature in several studies of the open parish of Headington, now a suburb on the eastern side of Oxford. Headington Quarry, a squatter settlement which grew up alongside the stone quarries, first appeared on the edge of Shotover Forest in the medieval period and remained a working-class district well into the 20th century. New Headington was created in the 1850s. One common source of income for the population was home laundry, servicing the well-to-do of the city and the university colleges. The 1861 census recorded 24 laundresses in the parish (Mason 1989, 372). Air was cleaner

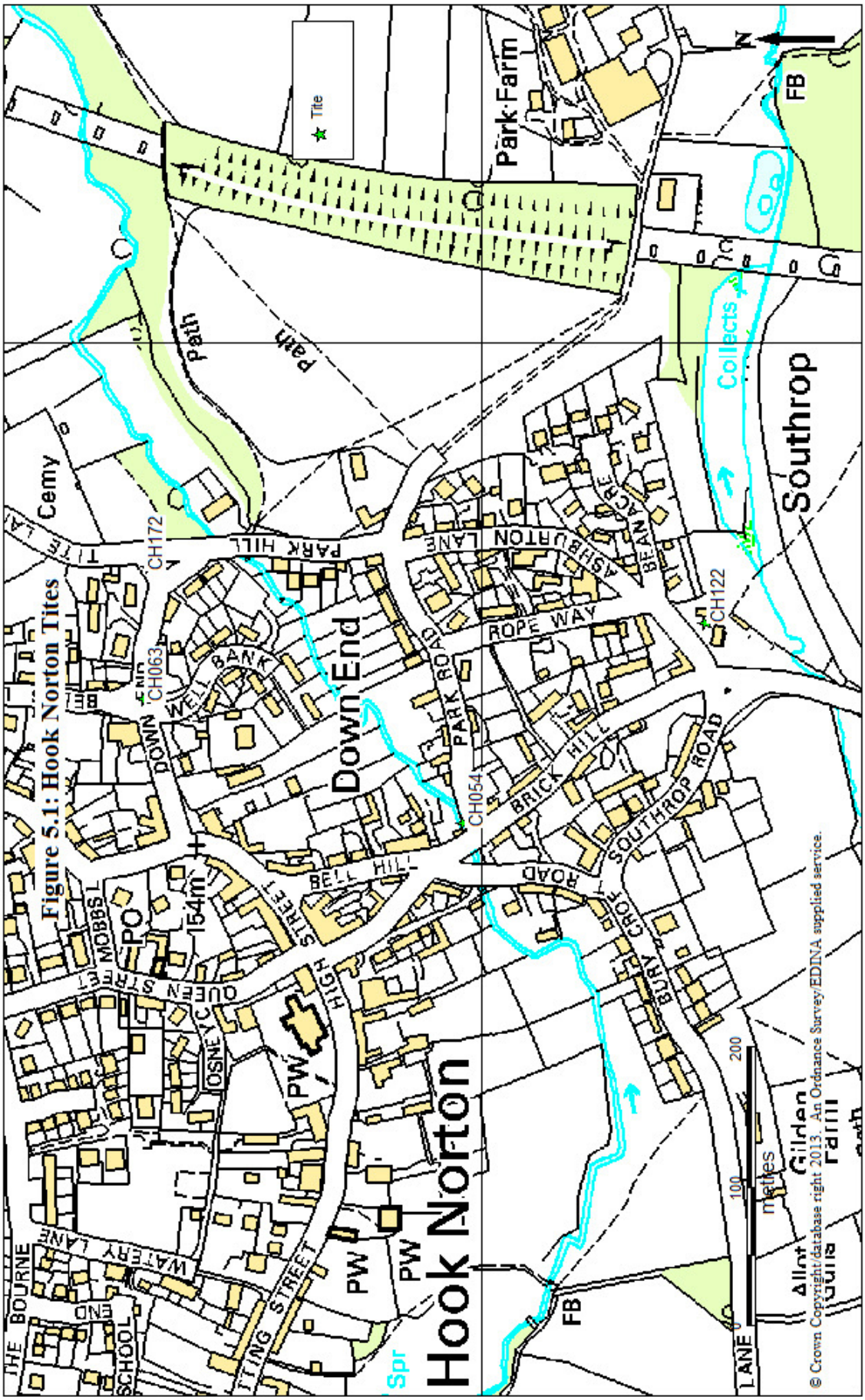


Figure 5.1: Hook Norton Tites

for drying on the ridge where the villages were situated and the other forms of employment were unreliable. The women of Headington had no piped water, indeed many households depended on water from flooded quarry pits, but laundresses must have obtained it from wells and pumps (OX093) (ibid, 372). The quarrymen were able to turn their hand to well digging fairly easily, though making the associated brick and timber structures was more challenging (Samuels 1975, 166). While it was hard work, laundries obviously proved lucrative and a small number survived post World War II, by which time the water supply had improved (Jenkins 1998, 29). Headington has changed and the wells and indeed most of the quarries have disappeared beneath modern development.

5.2.3 Finmere

The parish of Finmere lies on the Oxfordshire/Buckinghamshire border, and the hamlet of Little Tingewick, actually in Buckinghamshire, was considered part of Finmere village. By 1753, this closed parish was part of the Stowe estate owned by the Temple family who had first acquired land there in 1602. The Temples, later raised to the peerage, and the vicars, particularly William Palmer, had a reputation for treating the inhabitants well (VCH Oxon VI 1959, 119). After the Duke of Buckingham and Chandos went bankrupt in the 1840s, Merton College bought most of the Finmere land (Blomfield 1998,27).

A survey by the Finmere Local History Society in the 1990s recorded 17 wells and three pumps around the village, although only one well (CH209) and two pumps (CH009, CH010) survive (Plate 5.1b). Both of the pumps were made by Roberts of Deanshanger, Northamptonshire, and installed during the incumbency of the Reverend Seymour Ashwell at the end of the 19th century. The Vicar had paid for a dowser, John Mullins, to identify potential sites for wells in 1887. One of the wells he paid for, on Mere Road (CH245), was removed by builders in the early 1990s (Boddington 1999, 1-4).

5.2.4 'Lark Rise to Candleford'

An interesting study of the relationships between open and closed elements within a parish and between adjoining parishes comes from north Oxfordshire, in the area where the writer Flora Thompson grew up. 'Lark Rise to Candleford' (Thompson 1954) was an autobiographical trilogy describing life there at the end of the 19th century. Although Thompson used fictional place-names, the real places are easy to identify.

In the open hamlet of Juniper Hill, which had grown up around the heathland in the closed parish of Cottisford, there is now a small group of cottages, including the former pub, but no visible evidence of early water supply (Author visit 2012). According to Thompson, in her birthplace, referred to as Lark Rise, most of the cottages at Juniper Hill were owned by tradesmen in the nearby market town and the tenants preferred to pay the rent rather than occupy tied cottages where the landowners would exercise control over private lives (Thompson, 1954, 6). Three of the thirty cottages apparently had their own wells with others obtaining their supply from a surviving well on a derelict plot. Water butts helped reduce the amount of water to be fetched in yoked buckets filled using a windlass. Fetching water had been the job of the women, but later men would do it at night. Apparently if the wells failed there was a pump at a farm half a mile away. Privies were merely deep holes at the bottom of the garden, emptied every six months (ibid, 7-8).

The village of Cottisford itself is likewise small, with little surviving evidence of early water supply. In the 20th century a water tower (CH107) was erected on the outskirts of the village (Flaxman & Flaxman 1999, 11), but this has been demolished. In Thompson's Fordlow the houses were of better quality and reserved for the vicar, school teacher and important farm-workers. The landowner was Eton College, which leased it (Bloxham 2007, 57). The estate farm was also in the village, which had been built as a model village. According to Thompson (Thompson 1954, 189), the school had wash basins, but the water came in buckets! There was a well and pump in the yard, which in 1915 was not working and anyway not fit for drinking. In

1823 new cottages had been erected at the Warren, in two terraces with a single well between them (Flaxman & Flaxman 1999).

Fringford, a closed parish, was owned by the Harrisons of Shelswell Park. There is a large village pond (CH065), renovated in 1992, and pumps (CH057, CH059) have been erected on the sites of public wells shown on the 1st Edition OS map. Thompson moved to Candleford Green, as she called it, after leaving school to work at the post office attached to the smithy. This was an old established settlement complete with shops and inn and occupied by a range of social classes. On the outskirts new building had begun and those houses had water connected to the kitchen sink.

A plan of the real smithy (Bloxham 2007, 130) marks two wells (one in the garden and one in the kitchen yard), not three as listed in the book, and a pump in the kitchen. An earth closet privy was located in the back garden. According to Thompson, a bath-house had been constructed in one of the out-buildings, its copper filled from the pump (Thompson 1945, 490). As the smithy is now a private house (CH255) the level of survival of the wells has not been ascertained.

Hardwick, in the next parish to Cottisford, was created as a model village when the owners of Tusmore House moved the existing village away from their park (VCH Oxon VI 1959, 168-73). Thompson gives a brief description of the neat cottages with a pump for each group of three (Thompson 1954, 336), although the school house is the only place where the location of the pump is readily identified (CH067).

Thompson also describes visits to the market town, Candleford in the book, which is based on aspects of several towns, including Bicester. Bicester had many spring-fed wells and a waterworks (CH064) and piped supply was installed in 1905 (VCH Oxon VI 1959, 14-56), after Thompson's childhood. By the 1880s Thompson claims some tradesmen of the town had running water to the kitchen tap and a WC, albeit in the yard. The water, however, was pumped up daily to

a cistern in the roof (Thompson 1945, 388).

5.3 Planned villages

5.3.1 Nuneham Courtenay

From the 18th century the enclosure movement and the establishment of large parks around country houses led to the removal of many villages, which were seen as inappropriate within the landscaped setting or surplus to the requirements of the work-force, and in danger of causing a drain on the Poor Rate. Some landowners rebuilt these villages in other locations or carried out programmes of building in a particular style (Williamson & Bellamy 1987, 136-8). While the motivation for this work was not usually the well-being of the inhabitants, the new houses were often better built and with more facilities than those they replaced. Gillian Darley includes in her 1978 book 'Villages of Vision' this quotation from old men in Penshurst in 1899 about their well:

"Might so well have gi'ed us a pump, mightn't they?" "Lord love ye, that wouldn't have been quaint fashioned enough."

The most well-known example from Oxfordshire is Nuneham Courtenay, believed to be the inspiration for Oliver Goldsmith's poem 'The Deserted Village' (Batey 1970, 18). When Lord Harcourt commissioned his mansion set in Nuneham Park in 1760 the original village, farms, mill, school and parsonage were demolished and a new village was constructed on the turnpike 2.5 km away (Batey 1968, 110). The population was forced to move, although one old widow did gain permission for her cottage to remain until her death. The churchyard was also cleared and a new one, in the style of a classical temple, constructed on a suitable vantage point. One of Harcourt's descendents built a new church in the village in 1880, accessible to its inhabitants (ibid, 114).

Eighteen pairs of semi-detached houses (SO199) were erected parallel to the road to form the new

village, with two rooms downstairs and two in the roof space. There were gardens to side and rear. A few larger buildings were constructed, including the Harcourt Arms, a smithy and a house for the curate. A single chimney-stack served each pair of houses, which each had an oven in the dividing wall (Airs 2001, 396). The design of the houses was very plain, with none of the picturesque style that became increasingly popular (Williamson & Bellamy 1987, 166). There is no mention of any provision of water or a privy, but presumably the latter were situated in the gardens. The 1st Edition Ordnance Survey map from the 1880s shows wells, which may have been dug when the houses were built.

The house and park (SO141) were well served. The duck pond (SO198) was converted into a lake, extra water being pumped up from the Thames. Several new ponds were constructed around the grounds and a well (SO040) formed a focal point in one area. New houses were built on the site of the old village for some of the key estate workers, such as the bailiff, where the wells remained (Batey 1970, 19). The water supply for the house itself came from a well over which a brick pumping house (SO032) has been erected (Oxfordshire HER). There is also a brick water tower on the estate with a level scale on the outer wall (SO092) (Plate 5.1c), but this appears to be 19th or early 20th century in date (www.geograph.org.uk).

5.3.2 Heythrop and Mixbury

When the estate houses (WO192) were constructed at Heythrop in 1873 by Albert Brassey, they were all fitted with underground storage tanks which were fed with rainwater from the gutters. These superior properties had damp courses and the outside privies had night-soil tanks vented with soil pipes. Brassey was the son of a railway magnate and, although he exerted control over the tenants by omitting to build an inn or even a shop (women might be tempted to waste time on gossip), his ideas on appropriate levels of comfort were advanced (OFWI 1999, 130-1).

Other villages were less fortunate. The closed parish of Mixbury was held by the Batson family

from 1767, although they did not live in the parish. In 1874 the thatched and dilapidated cottages, built of local stone, were replaced by order of the Court of Chancery with about 40 semi-detached houses, built of coursed rubble with red brick dressings (VCH Oxon VI 1959, 252). These line the single street with a single pump at the southern end (CH185) (Plate 5.1d). However, the VCH does say that there were many shallow wells in the area (ibid, 251).

5.3.3 Ardington and Lockinge

A large scale rebuilding was carried out by Lord Wantage in the 1860s in the parishes of Ardington and Lockinge, then part of Berkshire (Havinden 1999, 68). The villages on the downs were always able to take advantage of springs on the edge of the Greensand and that is where most habitation is located. The Wantage estate was established in the 1850s on land purchased by a banker and passed to the future Lord Wantage by marriage (ibid, 36). The title was created in 1885. The Lockinge estate was the largest in Berkshire in 1873 and unusually was actively managed by Wantage himself with a strong social philosophy. He introduced profit-sharing schemes and established co-operative societies to help ensure cheap food was available (ibid, 84-5). The Wantage philosophy extended to housing conditions, his model cottages of 1860, regarded by Government inspectors as among the best such houses in the county, were equipped with built-in coppers and had earth closets. Running water was not provided but, as already stated, the Greensand allowed for many shallow wells (ibid, 94-5). In 1903 Lady Wantage had a village hall built, where three public bathrooms (VW068) were available on Fridays and Saturdays at a cost of 3d (ibid, 128). The estate continued to build and improve the housing stock with all houses built after 1945 having a ground floor bathroom, back-boiler for hot water and a second WC outside (ibid, 170). By 1961 only 8.4% of houses still used earth closets and 56.5% had bathrooms. The family is still associated with the estate, but the land and housing are now mainly controlled by a series of trusts (ibid, 203-4).

5.4 Small Estates and Village Supplies

By the later 19th century some villages and farms had communal water sources. In several of these, reservoirs supplied a network of taps or even pipes connected directly to houses (Naylor 2005, 30). Some schemes were instigated by individual landowners or farmers who wanted to improve conditions for their employees, but later on public bodies became involved.

5.4.1 Hydraulic ram systems

In Ashbury a hydraulic ram (VW012) was erected on the stream which runs down the west side of the village through cress beds. The ram pumped water to a reservoir (VW013) at the top of the village in the south from where it fed taps along the main streets by gravity. In 2000 the ram (VW012) and reservoir (VW013) (Plate 5.2a) were still in place, but none of the taps survived. A tap of identical design was found in the nearby village of Bourton (VW014), in the popular lion's head style, used by Glenfield and Kennedy. The publically funded and maintained Ashbury system post-dates the changes in law in 1872 which placed obligations on local authorities with respect to quality of water supply (Author visit 2000; Geoff Douglas (Ashbury Local History Group pers. comm.)

Another hydraulic ram was placed on a dammed stream at Whitehill Farm (WO003), Tackley, although there are few visible remains (Author visit, 2000) (Figure 5.2). This system was paid for by the landlord, Corpus Christi College, for the benefit of the farmer and his employees, as part of construction of a new farmhouse in the 1870s. It was the farmer who had asked for the improvements (Corpus Christi 1874-6). The farmhouse had a storage tank in the roof, but the cottages had to rely on a shared tank outside. Sanitation still relied on privies (Rupert Hall & Corby 2000).

Elsewhere in the parish wells were used. Higher parts of Tackley were serviced by deep wells (WO021) from the early 20th century, with wind and later electric pumps. In 1968 a piped water

supply was installed (VCH Oxon XI 1983, 194-208), using boreholes and a reservoir, traces of which have survived (WO022).

Strattonborough Castle Farm, near Watchfield had a system of hydraulic rams (VW058) to supply the farmhouse and troughs in the fields from a spring. Three brick and concrete structures on a north-south slope have been identified, the centre one with a pipe carrying water to a trough. By the lowest of these probable ram chambers two rams were found during the National Trust survey of the land in 1992 (Matthews & Wainwright 1992).

Similar chambers were identified in other locations by the author during site visits, at Great Bourton for example (CH006) (Plate 5.2b). Three chambers within a single field were also found at Upper Wardington (CH003, 029, 030).

5.4.2 Reservoirs, water towers and pipelines

Some of the larger villages were connected to a communal waterworks in the later 19th century. Private water companies, mainly formed to supply the towns, later extended the

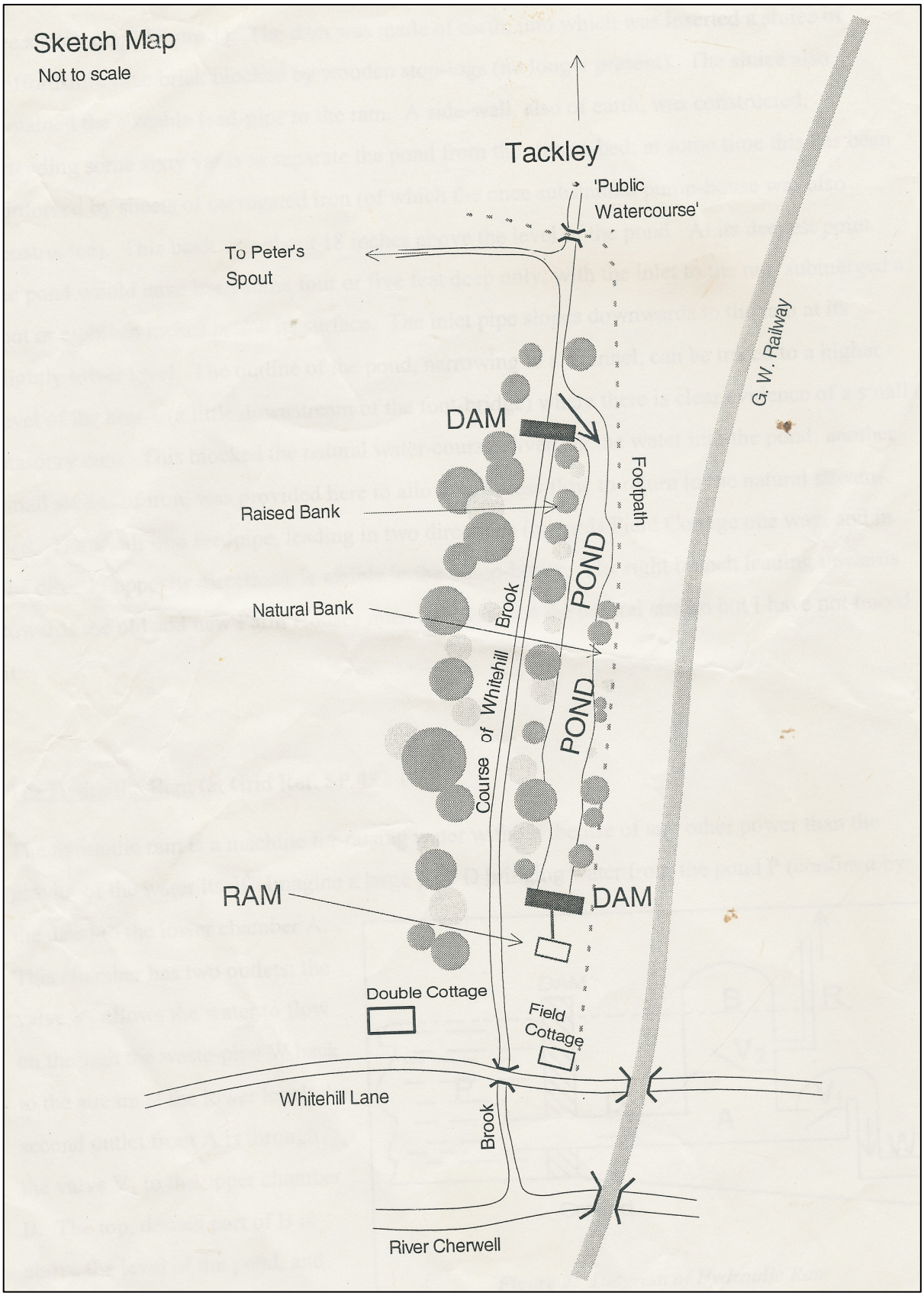


Figure 5.2: Whitehill Farm Water Supply, Tackley (WO003)

(from Rupert Hall & Corby 2000)

supply into rural areas. The Goring Water Company had a reservoir and later a water tower (SO130) at Woodcote (OFWI 1994, 8). The Woodcote site continued in use and the old building and reservoir location are adjacent to a modern Thames Water facility (SO138). The Henley Water Company (SO088) also supplied water to villages (Kelly's Directory 1907), although not necessarily to the houses themselves. Not everyone was prepared to pay for their water and some refused to be connected.

At Woodeaton Manor a water tower (SO001) (Plate 5.2c) was constructed during the 18th century (Oxford Archaeology 2005a). This was obviously intended to supply the house and its associated buildings, but on the boundary wall, facing the village centre, is a metal fixture (SO202), noted by the author. There is a similar feature (VW016) on the wall of Sutton Courtenay Manor, again facing onto the village street, again noted by the author, which was a water point. This would suggest that the landowners in the small villages did share their supply with local people to some extent.

A prominent landmark from the M40 motorway between Oxford and Banbury is a large rubble and concrete water tower (CH043) (Plate 5.2d). It is not associated with the motorway, but was erected at Trow Pool in 1909 as part of a water supply for Bucknell Manor, the farms and village. Water from a spring was pumped by wind, later electricity (VW119), into the tower. The system was paid for by Major Hunlocke and continued in use until 1951 (VCH Oxon VI 1959).

5.5 The Southern Chalklands

In the south-west of Oxfordshire the issue of water supply is more affected by the geology of the area than land ownership patterns, although the two are not unrelated. Most of the parishes were classed as intermediate. Mapledurham is the only closed parish where landowner control was strong, and Shiplake, Harsden and Whitchurch were also

closed. Only Nettlebed and Rotherfield Greys appear to have been classed as open, as was the urban area of Henley (Byung Khun Song 2002, 209).

The solid geology of the area is mostly chalk, with some areas of clay overlying it, as shown in Figure 3.1. As a consequence of the permeability of the chalk rock the water table can lie well below the ground and this in turn means that sinking a well can easily involve drilling to depths in excess of 100 m (OFWI 1994, 8-9).

Within the upland areas of South Oxfordshire lie the sites of a number of deep wells, several of which survive although no longer in use. The difficulty and expense of sinking wells proved an effective deterrent before the middle of the 19th century with few earlier examples known in that area. The dangers of well digging were illustrated in Brighton *c* 1860 when the Woodingdean Well (SX002) was dug manually using largely pauper labour. One winchman fell to his death and the entire gang only just escaped drowning when water was finally struck at a depth of *c* 460 m, from which the climb out apparently took 45 minutes! (Grant 2006).

The earliest of the deep wells (SO006) is at Greys Court, Rotherfield Greys, originally the seat of the de Grey family from at least the 11th century. Most of the existing mansion emerged from remodelling carried out by Sir Francis Knollys in the later 16th century (Jones 2003, 79). More significant than the house itself for this study is the detached Well House, built in 1586-7. It houses the well shaft together with the vertically mounted donkey wheel used to draw water to the surface, the largest surviving animal-powered water drawing mechanism in England (Jones 2005, 5). The shaft is 61 m deep. It is not known how long it took to construct or if any lives were lost in the process. The well was in use until 1914 when mains water was installed. Interestingly, there is a 19th century pump (SO007) outside the dower house to the south-east of the main house.

Rotherfield Greys was an open parish, with a number of hamlets, but no village as such. The hamlets in the west, including Highmoor, belonged to the Stonor estate not Greys. The proportion of freeholders in Rotherfield Greys had been larger from the 14th century onwards and from the late 17th century the estate was broken up between mainly non-resident landowners, the house and park passing through a series of hands (VCH Oxon XVI, 2011). No evidence has been found of any attempt to provide a water supply for the hamlets until the late 19th century.

Before this time the villages of south Oxfordshire were almost completely reliant on small ponds, stored rainwater or water from rivers. Later, tanks were placed in roofs to collect rain water as it ran through the thatch (Kift 1999, 35). A few private wells existed, for the well-to-do. The ponds were unreliable in hot and dry weather, storage was limited and transporting water, often some miles from the nearest river, was arduous (Preece 2009, 47). Although some made a living out of collecting and delivering water, as discussed in Chapter 3, many, usually women, made the trip themselves. In the 1720s William Boyle sank the well (SO013) at Shiplake Row, Binfield Heath (Plate 5.3a), as a trade-off with the parish for the use of a spring to supply his new house (Henley Standard October 2005).

At Nuney Green there were two ponds (SO188), one for animals and a separate one for human use (Preece 2000-1, 12). A similar arrangement exists at Greenmoor Common, Woodcote (SO127), (see Chapter 7). The lower pond has a flight of steps leading down into it to ease the filling of buckets. Near the top of the steps are the remains of a brick well house (SO129). This is sealed and it is not certain whether this was in fact a well or housed a ram which sent the water to a well (SO201) on the edge of the road (Woodcote Conservation Group 2005).

These parishes were of mixed type, featuring both large and small landowners, but without the planned villages associated with great estates. In the mid to late19th century a series of wells was sunk to serve parishes across the chalklands of Oxfordshire and Buckinghamshire, most funded by local landowners (Kift 1999, 35-7). The earliest recorded, donated by Stanley Gardiner of Coombe Park in 1853, survives at Whitchurch Hill (SO119) (Plate 5.3b). The Gardiner family later paid for a rain-catchment system supplying a reservoir (SO120) (SO121) from which water was pumped to a tap. In 1886 the entitlement was a daily two gallons for a charge of 1d, and a caretaker lived on site to ensure that this quota was respected (Preece 2000-1, 10). The site has now been redeveloped, but the caretaker's accommodation was saved and moved to the rear of the village hall, complete with its board setting out the scale of charges (see Chapter 7).

At Highmoor Cross a well (SO005), erected in 1865, survives complete with drinking fountain and letter box. The vicar paid for the well and a local lady for the well house above it (Spencer-Harper 1999, 49-50). The Stapletons of Greys Court funded a well at Rotherfield Greys, its house now a bus shelter, probably to mark Queen Victoria's diamond jubilee. The Misses Blount paid for one well at Tinkers Green (SO191) in the early 20th century, the Vanderstegans of Cane End House another at Cane End (SO190) in 1876 and various members of the Palmer family for wells at Dunsden (SO163) and Gallowstree Common (SO100) (Plate 5.3c). The Kidmore End (SO009) and Shiplake Bottom (SO008) wells were paid for by public subscriptions, the latter bearing the inscription 'This well was dug by public subscriptions for the use of the poor for ever' (Kift 1999, 35-7).

The most unusual sources of funding for these wells were perhaps two prominent native citizens of British India, friends of the Reade family of Ipsden. Edward Reade had

worked in the North-West Provinces where he had become acquainted with the Maharajah of Benares to whom he talked about his home and the problems of the villagers. In 1863 the Maharajah provided money for the well at Stoke Row (SO010), where the decorative canopy provides a constant reminder of his generosity (Spencer-Harper 1999, 36). In Ipsden itself is another well (SO012), paid for, according to its plaque, by Rajah Sir Deonarayan Singh in 1865. This is sited outside the churchyard, within which there are now two pumps (SO117, SO165). It is ironic that people in the prosperous south of England needed Indians to provide them with a decent water supply. Why the Reade family did not meet the need themselves as others of their class in the area had remains an unanswered question. The Elephant Well (SO078), a spring at Peppard, has no Indian link despite the iconography over the structure: the elephant is an emblem of the Blounts, local gentry (Preece 2009, 49). Oxfordshire was not the only place to benefit from Indian generosity and there is a fountain, now dry, from 1869 in Regents Park (LO018), where the face of Sir Cowasjee Jehangir, a wealthy Parsee gentleman, is just discernible. The inscription tells us that it was a gift to the people of England in gratitude for the protection enjoyed by Parsees under the British Rule in India (Warraq 2008).

The motivation for the funding of the wells in South Oxfordshire appears to have been largely philanthropic, although the issue of patronage does arise. This commitment to improving the lives of the poor is typical of the type of activity associated with the evangelical Christianity which emerged during the early 19th century (Kidd 1999, 71) (see Chapter 6). The number of clergymen and benevolent ladies behind the donations suggests that concern for the well-being of the populace was the primary reason for action, but it has not been possible to identify what obligations in the way of church attendance or moral behaviour might have been imposed (Owen 1965, 95).

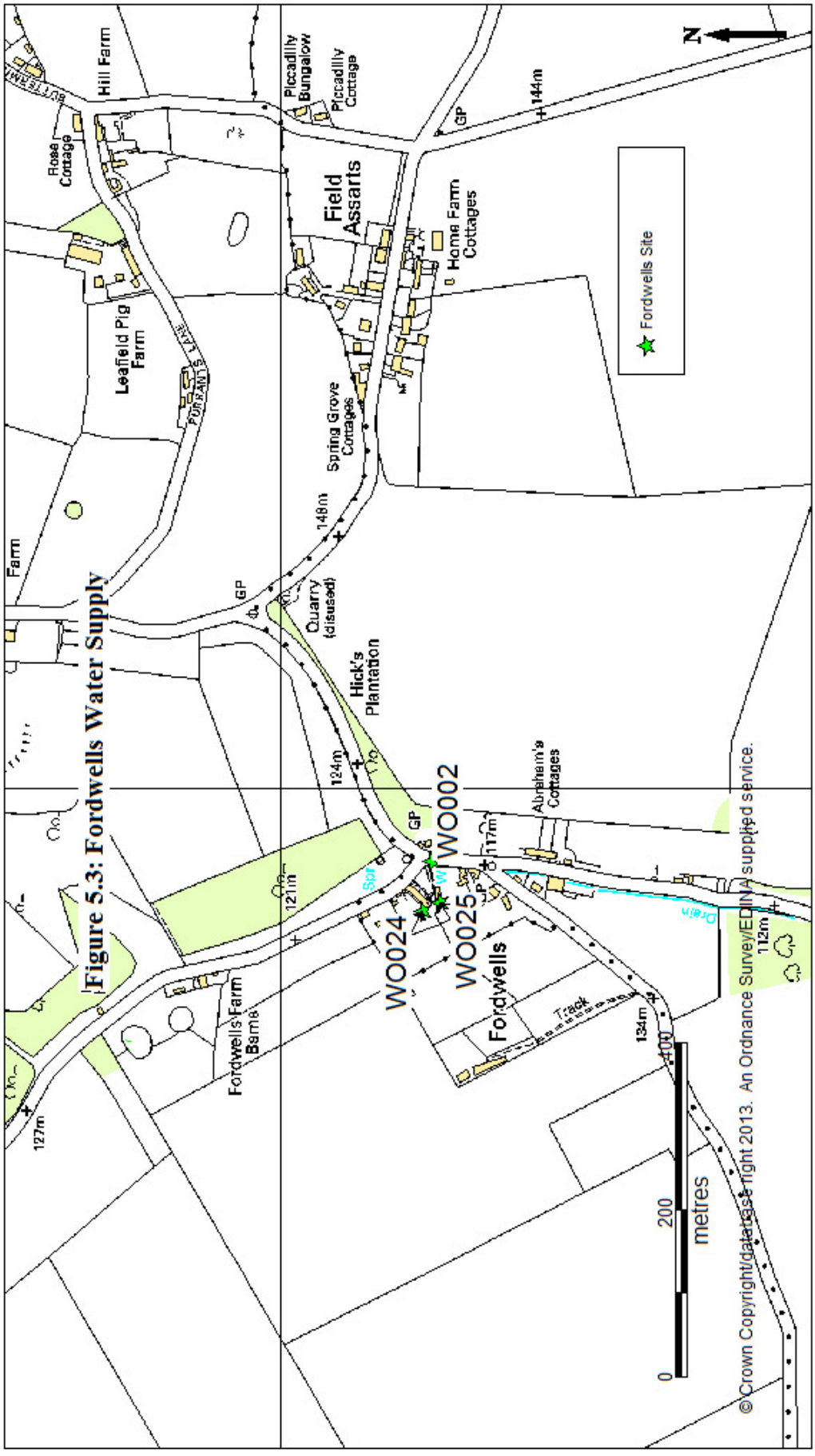
The actual construction of the wells also benefitted the local people. Labourers, such as the Payne family from Gallowstree Common, were employed to find suitable locations and sink the shafts (Preece 2000, 8). Most of the wells, including those paid for by the Indians, were provided with machinery produced by Wilders of Wallingford. Wilders was also responsible for the decorative work at Stoke Row (SO010) and a surrounding fence for the Ipsden well (SO012) (Kift 1999, 35).

Something is known of how the upkeep of the wells was funded. A cherry orchard attached to the Maharajah's Well (SO010) was to pay for maintenance from sales of fruit, (see Chapter 7). Villagers were charged 6d for a key to the Kidmore End well (SO009).

These wells made a tremendous difference to people in an area where piped water to the home was still by no means the norm. Some people were still having to travel some distance to the wells and all the water had to be raised and transported to the home. It could take more than ten minutes to raise a bucket of water, and one family apparently made 24 trips per week (Preece 2000-1, 10). Unlike pond water, the supply remained clean, but the wells could still run dry in summer.

5.6 Persistence of off-mains supply

There is still a limited number of homes in Oxfordshire which are not attached to the mains supply and, despite some inconvenience, are likely to continue to rely on alternative sources. In general this is related to the cost of installing the necessary pipework, which must be borne by the landowner unless the work can be carried out as part of another, probably unrelated enterprise. When Wychwood Forest lost its legal status as a forest in the later 19th century a new community was established at Fordwells and a water supply established (Figure 5.3), which uses a spring (WO024) feeding into a cistern (WO025) behind a row of cottages. From there pipes lead to a trough (WO002)


Figure 5.3: Fordwells Water Supply
Fordwells Site
WO024
WO025
WO002
Fordwells
Fordwells Farm Barns
Hick's Plantation
Quarry (disused)
Spring Grove Cottages
Home Farm Cottages
Field Assarts
Piccadilly Bungalow
Piccadilly Cottage
Hill Farm
Rose Cottage
Leafield Pig Farm
Abrahams Cottages
Track
GP
144m
148m
124m
121m
117m
112m
134m
127m
0
200
400
metres
N
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(Plate 5.3d) by the side of the road and then go on to supply other houses. In 1880 the Chipping Norton & Witney Rural Sanitary Authorities were granted an easement of the rights to this supply (Farrant & Sinden 1880). When mains water was installed in the village of Fordwells, several cottages were too far along the road to be included and these are still using the earlier supply. The trough is clearly marked as water for human consumption by West Oxfordshire District Council but the health and safety issues related to the guarantee of water quality are a concern for residents. There have also been some attempts by Thames Water to claim rights over the supply (Author visit 2000; Ken Betteridge (Asthall Parish Survey Group) pers. comm.).

The Environment Agency will carry out periodic checks of supplies from wells and does so every six months in Blewbury, South Oxfordshire. This village lies on the edge of the chalk, on the springline, so almost every house has its own shallow well. Many are still maintained and used, albeit not as the sole water source (Author visit to Blewbury and Blewbury Local History Society, 2000; Blewbury Local History Society pers. comm.).

A pair of cottages on the Chiltern Ridge just outside Chinnor has never been connected to the water main. For a long period both relied on a hydraulic ram on a spring feeding the Cuttle Brook, which flows into the River Thame. The cottages had water tanks in their roofs which were filled from the spring. The owner of one cottage subsequently paid for a borehole to be sunk, more reliable and convenient than the pump, which lies on the opposite side of a railway line from the users (Author visit to site 2000; Patrick Whelan (Chinnor Historical & Archaeological Society pers. comm.). The second cottage was still using spring water in 2000.

5.7 Great houses and large estates

5.7.1 Blenheim and Woodstock

The Blenheim Park estate is situated on the west side of the town of Woodstock, from which there is access for pedestrians through gates in the park wall. The relationship between the Marlboroughs, the town and water supply is similarly close. After the 1st Duke of Marlborough was given Blenheim, the Marlboroughs accumulated significant landholdings in and around Woodstock, but it would be nearly 50 years before their real influence on the town was established (VCH Oxon XII 1990, 400-06). The local aldermen and the Marlboroughs were involved in supplying the town with water, in ways which suggest mutual benefits, but also a sense of public duty and responsibility from the Marlboroughs (ibid, 397-8). Within the Blenheim estate function was combined with aesthetics in the water supply.

Blenheim originated as part of the royal forest of Woodstock in the medieval period, with a deer park enclosed in the late 12th to 13th centuries (Bond & Tiller 1987, 23). The underlying geology is limestone and several springs emerge within the park (WO006, WO037, WO084). The River Glyme, which has its source just north of the park flows through it before joining the River Evenlode on its southern edge. Originally the park lay on the west side of the river, but it gradually expanded, reaching the town by the 15th century (ibid, 49). The royal palace of Woodstock was built as a hunting lodge for Henry I, but further rebuilding by his descendants converted this into a palace (ibid, 42).

It was Henry II who developed the Everswell from a spring feeding fishponds into a bower for his mistress, Rosamund Clifford. The spring, now called Fair Rosamund's Well (WO006) (Plate 5.4a) still exists, on the north bank of the Lake. The medieval bower included three pools, of which a single one, in a stone surround, still collects the

spring water. By the 15th century the rooms, chapel, dovecote and pear orchard were in decay, although John Aubrey was able to sketch the layout in the 17th century and some remains can be seen on the lake shore (Bond & Tiller 1987, 47).

The popularity of Woodstock with royalty declined and at the end of the Civil War in the mid-17th century the palace was not considered worth repairing (Bond & Tiller 1987, 56). In 1705 the old manor was given to John Churchill as a reward for his military success. The Marlboroughs commissioned a new house, Blenheim Palace, with Vanburgh as architect (Bapasola 2009, 13).

Vanburgh's designs for the park included a north-west approach to the house, crossing the River Glyme over the Grand Bridge (WO005) (Plate 5.4b). The bridge contains a number of rooms within its uprights, providing among other things room for Aldersea's Engine. This pump sent 5 tonnes of water per hour up 40 m to a cistern built into the arch over the entrance to the eastern, kitchen, court of the house, using oak pipes. Although the system was effective, the engine was removed by the 4th Duke of Marlborough in the later 18th, century, ending up in Old Woodstock Mill (Green 1951 p243). The combination of utility and ornament in this scheme is not unusual, but this is a particularly fine example.

The park underwent a number of design changes, including radical alterations to the River Glyme itself. In *c* 1720 Colonel Armstrong designed a formal canal, leading under the Grand Bridge to a round basin to the west. Smaller flanking canals passed under the outer arches, one supplying Aldersea's Engine and the other a bath house (Bapasola 2009, 36). Further changes were made in the 1760s when the existing layout, including the lakes, was executed to designs by Capability Brown. Both Armstrong and Brown included cascades (Bond & Tiller 1987, 100), but plans for an ornate bath around

Rosamund's Well (WO006) were not adopted. It is probably fortunate that Blenheim contains the furthest downstream section of the river before it joins the Evenlode, so that changes to the flow would not have affected other users, such as Woodstock Mill and the town's water supply. Indeed the Glyme had already had to supply the needs of three other parks (Glympton, Kiddington and Heythrop) and the Enstone Marvels (Mowl 2007, 46).

The 4th Duke and his successors created a series of formal gardens around the palace (WO160), many including water features. In the 1770s a private garden was constructed around the site of the New Found Well (WO083) and the Bernini Fountain (WO053), a copy of a fountain in Rome, was installed in 1774 (Bapasola 2009, 92). This fountain was moved to the Water Terrace Gardens (WO132) in 1932. These gardens with a whole series of pools and basins were designed for the west front of the house by Achille Duchene in 1925 (ibid, 152). Duchene also restored the Italian Garden which had been laid out in the 1860s for the 7th Duke. In 1899 the 9th Duke installed the specially commissioned fountain (WO131) by Waldo Storey (ibid, 138-9).

In 1861, the 7th Duke made substantial improvements to the estate's water supply, building a new pumping station on the Blenheim Lake (WO036) to supply a reservoir (WO007) near High Lodge (Plate 5.4c). These supplied both palace and town until 1934 (VCH Oxon XII 1990, 398). The pumping station is still operating although only for the gardens, while the reservoir within the woods has been allowed to decay.

5.7.2 Coleshill

Other large estates had long-standing connections to the surrounding land with established control over the inhabitants. The manor of Coleshill (VW066) had been created by Edward the Confessor and was acquired by the Pratt family in the 17th century. It passed by marriage in the 18th century to the Pleydell Earls of Radnor who kept it until

the end of World War II. In 1662 Roger Pratt designed the house for his cousin George, with limited water supply (Finial Associates 2004, 17). This shortcoming was corrected in 1743-5 by Sir Mark Stuart Pleydell who created a system of tunnels (VW096), mapped in 1981 for the Highworth Historical Society (CART 2011) (Figure 5.4). The source of the water was springs at Middleleaze Farm (VW100) to the north of the house, which supplied a cistern under the service wing of the house. Tunnels were also constructed to take the overflow southwards, where it supplied the formal gardens. In the 19th century the supply was improved by the installation of hydraulic rams, which in turn were replaced by pumps during World War II (Matthews & Wainwright 1992).

The house was used during World War II for training, which required the construction of underground posts and stores in the grounds. Investigations of one of these, thought to be an ammunition store, in 2011 by the Coleshill Auxiliary Research Team (CART) found that it connected with the former water tunnels, and provided an opportunity to investigate and record these. They were found to be in good condition, although the water flow had decreased since the 1981 survey (CART 2011).

The scale of this tunnelling enterprise is unusual – the brick lined channels are *c* 1.2 m high and 0.7 m wide. It is clear from the remains that the water supply extended to some of the estate farms and to pumps (VW041, VW097-9, VW111) in the village also (Fox 2000). It is not clear whether the village was always included or whether the supply was laid on in the mid-19th century when the village was very largely rebuilt.

The industrialisation of farming reached its peak in the 'high farming' of the mid-19th century, which was in part a response to fears of a downturn in demand following the end of the Napoleonic Wars and to cheap imported grain after the repeal of the Corn Laws

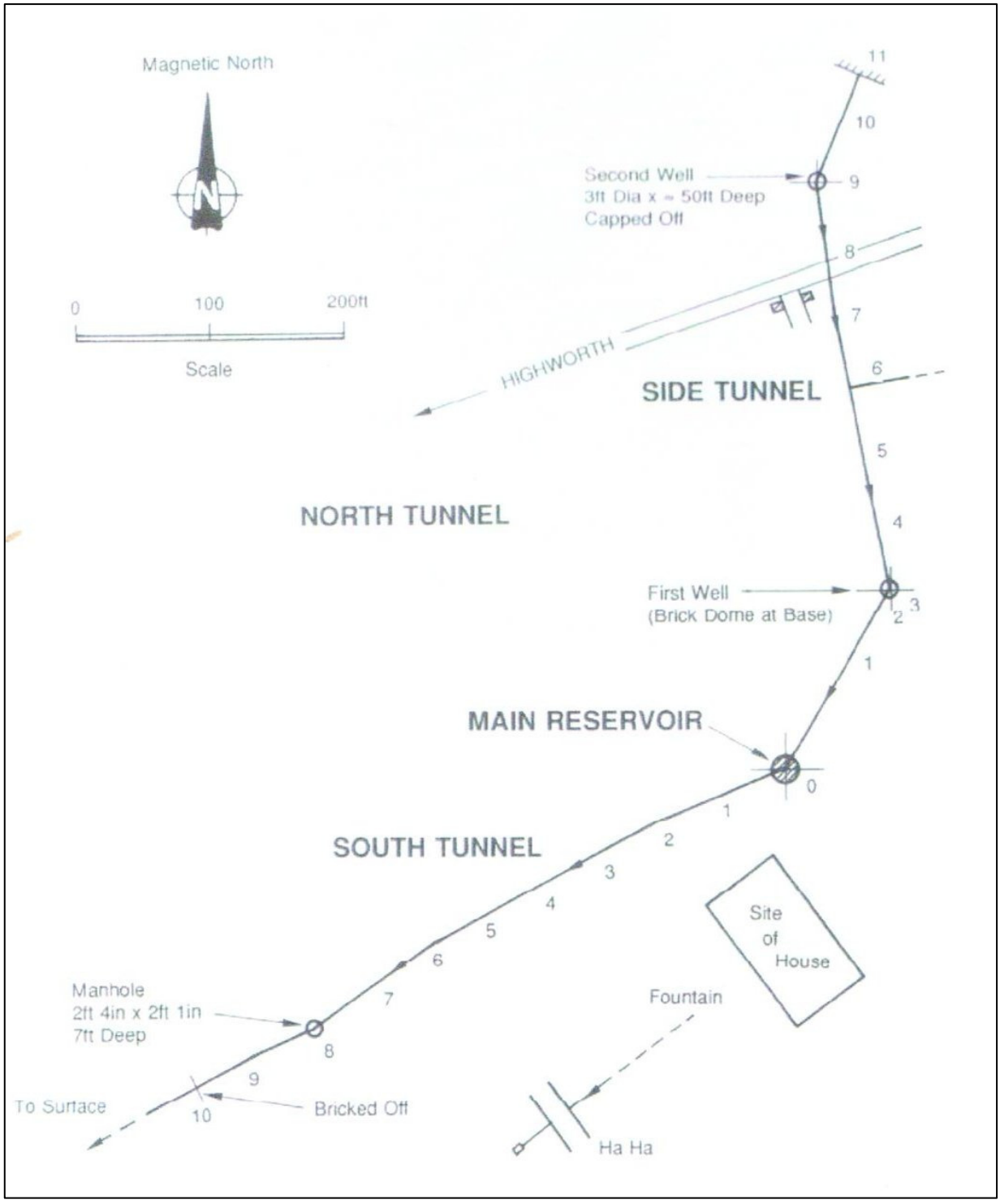


Figure 5.4: Coleshill Water Tunnel Map

(British a Resistance Archive - staybehinds.com)

(Thomson 1950, 36, 100), although these fears were unfounded and agriculture remained profitable until the 1870s. A fine example of a Victorian farm survives at Coleshill, where major improvements were carried out in 1852-4 for the 3rd Earl of Radnor by his agent Edward Wells Moore, a keen member of the Royal Agricultural Society (Finial Associates 2004, 20)

The agricultural and industrial revolutions were interlinked by supply and demand. Ideas from factories such as production lines were adapted on farms such as Coleshill where the layout allowed feedstuffs and timber from the estate to arrive for storage and processing at one end, to be easily distributed to the various animals and for waste products to be collected and removed at the other end (Wade Martins 2002). The complex used the natural slope to allow manure to be collected at the low end. The original plan was for liquid manure mixed with rain water to collect in a tank from which it could be piped directly to the fields, but this was not realised. Feed was by a steam engine to the various yards along tramways. As well as stabling, pig houses and cattle sheds, Coleshill is unusual in having yards for sheep (National Trust 1989).

The model farm at Coleshill was able to tap into the existing water supply for the steam engine and the animal pens. Waste water from the house was collected for use on the farm rather than the gardens (Matthews & Wainwright 1992).

In the 18th and 19th centuries creation of the farm was accompanied by rebuilding of the village which decreased in size. Coleshill was very much a closed parish where the Earls of Radnor controlled all aspects of life. The new village, without an inn, was intended to house the workforce required for the estate and conditions were, by the standards of the time, comparatively good. The new houses, many designed by Lamb, had no running water, but outbuildings contained wash-houses and earth privies (Matthews &

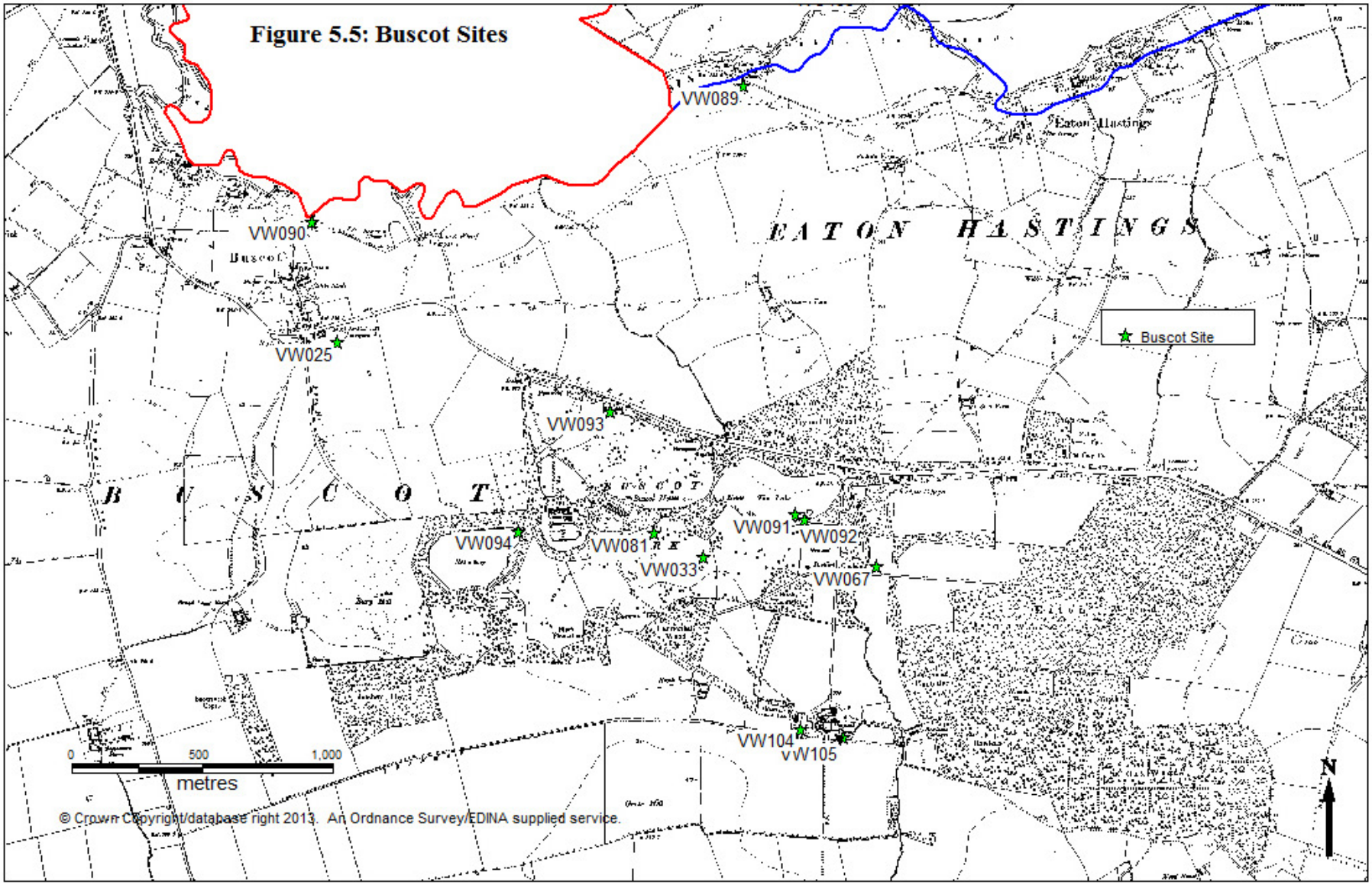
Wainwright 1992). As already discussed, a number of pumps existed around the village, one by the current site of the war memorial (VW111), and these continued to supply the village until the 1950s (Fox 2000, 16).

5.7.3 Buscot

Not far from Coleshill is Buscot, where there was another complex development of the water supply. The manor had a similar traditional history, owned by the Lovedon Townsends and their family until 1859 when it was sold in poor condition to an Australian, Robert Campbell (National Trust 2004, 6). Buscot lies on the River Thames and received the tolls from Buscot Lock. In the late 18th century the Lovedons had created a new 8 hectare lake to the east of the house and a 2 hectare fishpond to its north (VW091), fed from the River Thames. At that time the estate supported a thriving dairy business and thus wharves, locks and a short section of canal were constructed to allow cheese to be traded along the river (ibid, 48).

Campbell made few changes to the house, but transformed the land (Figure 5.5). His first move was to drain the land and construct a large reservoir (VW033) to irrigate the estate and help feed two artificial lakes near the house. Water was pumped to the reservoir from Buscot Lock (VW090) and Eaton Hastings weir (VW089) by water-wheel-driven pumps (National Trust 2004, 48). At Buscot Lock the pump was replaced in 1935 by a turbine, which is still in place and in use (Grey 1969, 2). At both sites the wheelpits from the original water wheels have survived (Matthews & Wainwright, 1992).

Campbell grew sugar beet from which he intended to manufacture sugar and alcohol. The distillery and a mill, gas works, artificial fertiliser works and vitriol (sulphate) works were built on an island at Buscot Lock, just west of Lovedon's cheese wharf (Grey 1968, 2), where he built a small reservoir (VW092) supplied from a stream, to protect the canal


Figure 5.5: Buscot Sites
VW089
VW090
VW025
VW093
VW094
VW081
VW033
VW091
VW092
VW067
VW104
VW105
Buscot Site
EATON HASTINGS
BUSCOT
0
500
1,000
metres
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N

from fluctuations in the height of water in the river arising from the use of flash locks. The canal and reservoir have been filled in, but the brick culvert linking them survives (Matthews & Wainwright 1992).

All his enterprises were linked – the fertiliser and vitriol used by-products from the gas works and cattle were fed on sugar beet pulp. To help with this Campbell had a narrow gauge railway constructed to connect the different parts of the estate. Although he claimed the distillery was profitable in 1871, by the end of the decade it had been closed and as much as possible of the infrastructure sold (National Trust 2004, 50). The railway from Buscot Village to Oldfield Farm was used until 1900, but now little remains of Campbell's innovative projects. Oldfield Farm was rebuilt as a 'model farm', its machinery powered by a water turbine (VW105). The water came from a reservoir on the west side of the farm, supplied from Campbell's main reservoir (Grey 1969, 3). A possible vent to the cast iron pipe between them protrudes from the grass south of the house. The farm survived into the later 20th century and the reservoir was retained (Matthews & Wainwright 1992).

The last known part of Campbell's water system is another pump house with a turbine (VW093), located just to the north of the original small lake. The turbine there was used to supplement the supply to the house by feeding hydrants in case of fire (Matthews & Wainwright 1992).

Following Campbell's death in 1887 the estate was sold to Sir Arthur Henderson, later Lord Faringdon. The lakes ensured an ample supply for the water gardens designed by Harold Peto for the Earl of Faringdon (National Trust 2004, 15).

There is no evidence of the means of water supply to the 18th-century house, although the

1889 sale particulars list a WC on the first floor and another in the basement where there was also a bathroom (National Trust 2004, 7). Campbell did not seem to include domestic supply in his extensive system, despite a reputation as a good employer. This may have been a matter of priorities which was never corrected when his ambitious plans failed. Some of the houses in Buscot village date to Campbell's ownership, but the main phase of improvements there dates from the 1890s (ibid, 16). Lord Henderson ordered the construction of the village pump (VW025), in fact a tap, which still stands under its square canopy (Plate 5.4d). The supply originally came from Campbell's reservoir although the tap is now connected to the mains. There was also a chlorination plant (W094) (Matthews & Wainwright 1992).

5.8 Parks and Gardens

The 'affordance' of water, the qualities it has which allow its use, encompasses a variety of 'values' and 'meanings' (Gibson 1986, 38). Water has an aesthetic quality, which produces a series of sensory experiences in observers, enhanced by the constant changes arising as it flows. These experiences can be pleasurable, stimulating to the imagination, mesmerising or even frightening (Strang 2004, 103). Water has also traditionally been used as a means of displaying the wealth and status of an individual, through elaborate fountains for example (Kamash 2010, 121). Both of these facets of the meaning of water have been incorporated into garden design from a very early date. It should be remembered that it was not always enough just to alter the flow of an existing watercourse: as described earlier, many estates developed whole water supply systems to feed both domestic needs and the gardens.

The aesthetic impact of water can explain why it was used extensively in garden design, but the driving force behind the move from geometric gardens to extensive landscaped parks was power. A slump in agricultural prices in the early 17th century allowed the

better-off to build up large landholdings at the expense of small farmers and lower gentry. As the sometimes unpredictable power of monarchs was replaced by parliamentary government the new landowners felt more secure in this ownership and invested in the development of their land (Williamson 1995, 13-6). Landholdings became political tools, both demonstrating the power of the large landowners and acting as a vehicle for promoting their ideas. As the 18th century progressed, polite society emerged, linking the aristocracy with the upper gentry through their appreciation of culture. Both these layers of society had gardens and parks, but they differed in scale (ibid, 17).

Medieval gardens were generally geometric and often enclosed by walls or hedges. Turf seats, viewing platforms, raised planting beds, arbours and fruit trees were common features and the presence of a central pool and fountain was usual (Turner 2005, 129). Mazes were also created, sometimes using water channels or raised earth banks rather than hedges. The bower at Blenheim described above may have been one. A series of double and triple moats still survives around the house at Beckley (SO140) (Mowl 2007,17).

From the late 15th century, garden designs became more elaborate. During the Renaissance period geometric designs remained the norm, with parterres, symmetrical terraces and views from the house, strongly influenced by Italy (Turner 2005, 148). The use of water was also more complex. At Tackley, John Harborne laid out a military-style sequence of lakes as a fishing garden (WO154), most of which survive and have been restored (Mowl 2007, 35-6). Water tricks or 'giochi d'acqua' featured in a number of gardens, represented in Oxfordshire by the Enstone Marvels created by Thomas Bushnell, who used a natural spring, the Goldwell (WO042). The site was restored and extended by the earl of Lichfield after Bushell's death in 1674, and made more of an entertainment, but by the 18th century it was out of favour. The banqueting hall was for a time a

carpenter's shop, but in 1846 everything was removed and the site became part of a domestic garden (Thacker 1982, 47-8). The grottoes, banqueting house and fountains were recorded in engravings by Robert Plot and the site was apparently very popular with Charles I and his queen, Henrietta Maria, despite the hidden sprays which wet visitors (Plot 1677, 241-44). Plot also records a water clock (CH256) and other tricks at Hanwell, home of Sir Anthony Cope (ibid, 239). The main architect of such engineering in Britain was Salomon de Caus, but it is not known whether he was involved with these Oxfordshire examples or whether his books provided the inspiration (Mowl 2007, 36).

During the Baroque period France, and in particular Versailles, influenced garden design. Avenues and canals represented the principal changes (Turner 2005, 166), used as a way of advertising the extent of ownership (Williamson 1995, 29). The development of Blenheim has already been described, but many other gardens were laid out during this period, including Heythrop (WO158), Shirburn Castle (SO136), which had a formal water garden, and Shotover Park (SO138). This last has a series of features set along an axis running east from the house: first a lawn with a fountain, then the Pond leading to the Long Canal, which terminated at a Gothic temple. The axis also extended west from the house to The Octagonal Pool (Jones 2001).

Ditchley Park (WO135) was designed for the 1st Duke of Shrewsbury by Talbot and Archer. To the east of the house is an avenue over three kilometres in length, which originally ended at a fish pond. Ditchley is remarkable for its early inclusion of a Classical Grove, where a more naturalistic theme was employed. Within the woods were paths, a rill, ponds, a cascade and, to the south, a cold plunge bath (Jones 2001). An octagonal pool stood above a surviving Bath House containing a square bath and 2 niches (Mowl 2007, 64). Cold baths became popular in the nineteenth century as part of the rise in popularity of water cures.

During the 18th century neoclassicism and romanticism became fashionable, fuelled by the Grand Tours followed by the wealthy. The effect on garden design was a move away from formal, geometric designs to the creation of an idealised landscape, an 'arcadia' (Wickham 2012, 126). Many great gardeners such as William Kent and Capability Brown were part of this movement. From the house the view moved swiftly from the more formal terrace to a vista of rolling green with strategic clumps of trees. Creation of these landscapes extended to the removal and sometimes rebuilding of farms and villages which did not fit the vision. Drives and walkways were created within woodland, with niches, seats, rustic bridges, temples and statues arranged as points of interest, providing many opportunities for contemplation of nature, including water features like cascades, pools and streams. Again this trend provided a way for the upper classes to demonstrate their superior status. Only the wealthy could afford to leave so much land unexploited and, with most of the countryside now enclosed and farmed, a 'natural' landscape was something apart (Williamson 1995, 24). It also ensured the seclusion of the ruling classes, both from the rural poor and increasing evidence of industry (ibid, 102).

Rousham Park provides a particularly fine example of this movement, not just by Oxfordshire standards. The estate, with elaborate water gardens, was created by William Kent for the Cottrell Dormers between 1738 and 1740 (Steane 1996 p46). As at Heythrop there is a Cold Bath (WO056) (Plate 5.5a), this time completely outdoors, and overlooked by a small changing room. Within the Venus Vale were fountains sending jets 310-315 m into the air (Mowl 2007, 74-5), which, unlike the Cold Bath, have not survived.

During the 19th century the emphasis in English gardens moved towards plants. More formal terracing was added to the landscape and a series of smaller gardens was created focusing on a particular period or part of the world (Turner 2005, 226). Water still played

a role and at Shipton Court (WO132) the Trot's Brook was canalised. One section of the brook was widened to create a rectangular swimming pool rather than just a plunge bath (Mowl 2007, 114).

Swimming pools became a common feature of early 20th-century gardens, often using existing streams as their supply. Such a pool (SO134) exists at Garsington Manor and Dora Carrington's description of it as a 'cess-pool of slime' raises a question over how much use they attracted (Mowl 2007, 156). Harold Peto's gardens at Buscot have already been described, but a swimming pool (VW081) was added close to the house in the inter-war period (National Trust 2004, 45). Geoffrey Jellicoe remodelled the gardens at Ditchley Park in 1936-8 by creating a sunken garden with a semi-circular swimming pool (WO149) beyond. This could be screened from view by the spray from series of water jets set along the straight edge and from urns along the semi-circular steps (Mowl 2007, 157).

Not everyone favoured a swimming pool. Lord Berners called them the 'height of vulgarity' but his life partner, Robert Heber Percy, had one built. The deep square pool (VW065) is at some height and is overlooked by two stone wyverns. An battlemented Gothic tower serves as a changing room (Mowl 2007, 163).

Overall, garden design became more varied during the 20th century, although the Arts and Crafts movement was very influential in the early years (Wickham 2012, 247).

5.9 From Holy Well to Spa

5.9.1 The origins of holy wells

The term 'holy well' has been applied, often without adequate evidence, to a large number of sites where there is a well or spring of considerable age, particularly where

there is folk-lore associated with it. An association with ritual or healing is certainly required: the definition supplied in the English Heritage Thesaurus of Terms is: *A well or spring, possessing religious or otherwise ritualistic significance, around which a structure, such as a niche, wall or shelter, has been constructed* (http://thesaurus.english-heritage.org.uk/thesaurus.asp?thes_no=1). As part of the Monuments Protection Programme (MPP), a Monument Class Description for Holy Wells was prepared (Bond 1990), which divided them into 7 types, five of which are represented in Oxfordshire:

Type A – natural spring e.g. Horse Well, Middle Aston (CH092) (Plate 5.5b);

Type B – improved access e.g. Ledwell (WO038) (Plate 5.5c);

Type C – cover to reduce pollution e.g. Epwell (CH085) (Plate 5.5d),

Type D – elaborate cover or well-head e.g. Badwell (VW017) (Plate 5.6a);

Type E – roofed shelter with seating – no example;

Type F – total immersion bath – no example;

Type G – associated chapel e.g. St Margaret's Well, Binsey (OX007) (Plate 5.6b).

It has been proposed that many holy wells have their origins with the Celts, who certainly had water cults (Faull 2004, 13). These sites were often adopted by the Romans and then the early Christians. While this may have been the pattern in western parts of Britain (Faull 2004, Logan 1980), there is limited evidence for such early origins in Oxfordshire. Rattue (1992, 332) suggests only three candidates: Holy Well at Tadmarton (CH034); Islip pool (CH089); Nelly Martin's well, Stanton St John (SO080). The first was close to an Iron Age hillfort, later used by the Romans who built a paved route to the well. The tessellated pool at Islip was discovered in 1954, near a Roman temple. The last was a Roman bathhouse, but the link with curing sore eyes suggests a possible earlier origin (Rattue 1990, 174).

Rattue goes on to suggest that the early medieval minster sites of Oxfordshire were

located at pagan springs which were Christianised, including Bampton, where the Lady Well (WO085) survives, and Bicester, where St Edburgh's Well (CH046) has been lost (Rattue 1995, 54). There are some clear links between wells and medieval saints, both through names such as St Tinniver/Donanvergh (SO059) at Beckley and through legends. St Frideswide fled from an unwanted suitor and the spring at Binsey (OX007) was allegedly created in response to her prayers for water (Bord 1985, 119-120). When in the early 12th century St Edmund Rich had his vision in the field by the River Cherwell in St Clements, Oxford a well (OX042) supposedly began to flow on the spot (*ibid,* 128*)*. From an early date St Edmund's Well attracted large numbers of visitors, so much so that the bishop of Lincoln banned such gatherings in 1291 on the grounds of 'pretended holy miracles' (Rattue 1995, 86). The site has been lost.

Visits to the well at Bartlemas, Cowley, dedicated to St Bartholomew (OX043), on May Day were the origin of the traditional May Morning rituals at Magdalen College. The events in Cowley ceased in the reign of Elizabeth I and the image of the saint at the well was burned (Rattue 1990, 105).

Activity at holy wells in England peaked in the medieval period, but following the Reformation the rituals were seen as too closely linked to Roman Catholicism. The practices were difficult to suppress completely, and supposedly only those wells which could provide good evidence for their healing properties were allowed to remain in use (Walsham 2011, 398). Some holy wells survive to the present day, but large numbers have been lost or converted into normal water supply features. By the later 19th century people had begun to develop an interest in folklore (Rattue 1995, 132), which led to a revival in interest in holy wells, several of which, like St Anne's Well in Caversham (BE001) and St Margaret's Well, Binsey (OX007) have been restored.

Rituals associated with water sources have never completely ceased. Although the well dressing of Derbyshire is probably the most famous, similar activity takes place in other counties or did until very recently (Rattue 1995, 141). The wells around Cornbury (WO066, WO086, WO089) or the Lady Well at Wilcote (WO043) (Plate 5.6c) were visited on Palm Sunday. Well water was added to bottles containing one or more of Spanish liquorice, brown sugar, peppermint and sweets before being drunk (Bord 1985, 78). By the 21st century the access in Cornbury had been restricted by the estate owner, Lord Rotherwick (http://finstocklocalhistory.blogspot.com/), but villagers from Finstock re-established the practice with a walk to Wilcote on Palm Sunday 2011 (Finstock News 2011, 2).

In the late 20th century the resurgence of interest in paganism and the so-called 'new age' movements led attention back to some of these sites. An online journal 'Living Spring' had a short-lived existence and the Wellsprings Fellowship, which researched Welsh wells, was established in 2000 (http://people.bath.ac.uk/liskmj/living-spring/journal /issue1/restored/wellsprings.htm). In 2007 a National Wells Index was set up, but it does not appear to have been active for long (http://nationalwellsindex.org.uk/). The 'Wells and Springs' forum on the internet carried reports of well watching at Binsey (Maloney 1999), on occasions including the winter solstice. The record says that pilgrims were visiting the well on the eve of St Margaret's Day, 19th July, to be sprinkled with holy water, up to 1951. Offerings left at the well (OX007) have been noted in recent visit reports.

Although these groups were short-lived, there is no doubt that holy wells are still visited. It is common to find offerings at the sites, sometimes flowers or rags tied to trees and bushes. The connection between water and health and good fortune supports many wishing wells. Any pool, even in the middle of a modern shopping mall, will soon collect

coins, indeed the impulse is so strong that the Rotary Club employs the wishing well as part of its fundraising activities (Rattue 1995, 142).

5.9.2 Chemical content and healing

The healing powers of wells and springs has been attributed to the intervention of an associated saint and/or the mineral properties of the water. It is not possible to determine whether divine intervention is responsible for a cure, but the chemical composition of the water can be tested. Although there are claims for cures from many wells, not all have been shown to have any unusual mineral content (Walsham 2011, 410). It is possible that in the past drinking pure rather than contaminated water may have been beneficial or that increased cleanliness may have been responsible. Bathing in springs is likely to have been much more thorough than the usual everyday regimen of limited washing.

Attempts to investigate the mineral content of natural water supplies scientifically began in the 17th century. The naturalist, Robert Plot, investigated a number of locations across Oxfordshire and Robert Boyle also carried out research (Walsham 2011, 423-4). A more systematic survey was published in the early 20th century as part of a series on the water supplies of various counties for the Geological Survey England and Wales (Blake, 1902, Tiddeman 1910). Boyle experimented with water from various sources in the London area, particularly Tunbridge Wells, giving details of the test methods including the use of 'galls' or oak leaves (Boyle 1683/4). Plot also used galls in his analyses. He identified springs with different types of mineral content, also noting seasonal variation in the levels of these minerals. He observed their capacity to lather soap was also affected, including the water in Thame, which was deemed unsuitable for brewing, producing a sulphurous smell within days (Plot 1972). The 20th century surveys did not include details of testing, but did identify the locations of a number of saline, chalybeate and sulphurated springs.

Generally salinity is regarded as effective for intestinal complaints, sulphur for skin complaints, and chalybeate for anaemia, infertility and obesity. Of the healing wells the largest proportion was associated with eye complaints. Rattue, in his list of Oxfordshire wells (Rattue 1990, 1992), lists thirteen wells associated with eyes. Only one well is associated with other specific complaints: the sulphurous waters of Sandford St Martin (WO045) were used to treat ulcers.

5.9.3 Spas

The perceived beneficial properties of mineral springs continue to draw people to spas across the world. From the later 18th century doctors promoted the health-giving effects of drinking or bathing in the water at various locations, which developed into resorts with hotels and leisure activities (Rattue 1995, 122). Some became very fashionable, most famously Bath (SM001). There were no significant spas of this type in Oxfordshire and its nearest large spa was at Leamington, where the Royal Pump Rooms (WA001) finally closed in 1997, although there is still a tap in the street (Royal Leamington Spa undated).

Hydrotherapy has been practised for thousands of years, but and became particularly popular during the 19th century when immersion, water jets and the wrapping of the body in soaking cloths were used to treat a range of complaints, not always appropriately (Havins 1976, 134). By the 20th century the medical profession was applying hydrotherapy with more circumspection. Both hot and cold water are used, although the limited hot springs in England have meant that Turkish Baths were the main hot source. There were several Turkish baths in Oxford (OX008, OX116-8), but none have been noted elsewhere in the county (VCH Oxon IV 1979).

In Oxfordshire there were a few small-scale spa enterprises. In 1751 a group of doctors from Oxford tested the Spa Well (VW031) in Kingston Bagpuize, but it never established itself as a resort (VCH Berks IV 1924, 349). The vicar of Shrivenham from 1764, the

Reverend Barfoot Colton, obtained a lease for land in the manor of Watchfield surrounding a spring (VW046) close to Pennyhooks Brook. A 'Cold Bath' was built on the site and the spring became known on later maps as 'Bath House Spring'. It is not known whether this was a commercial venture, but its presence may have led to the construction of a bridge over the brook at that point and to the establishment of a footpath leading to the site. The path does not appear on the 1758 map of the manor (Maw undated, 22). Although the spring survives and the ground around it looks disturbed, no physical remains have yet been uncovered.

In 1803 a chalybeate spring (BE002) was discovered in the grounds of a house in Caversham (then part of Oxfordshire), the water from which apparently had healing properties. For some years a 'Physic Garden' operated at Springfield House (Kift 1980, 42-3) and the water was sold, despatched by carrier to Reading and to Henley (Wing 1894). The area has been considerably redeveloped in recent years and there is no trace of the spring remaining.

At Astrop in Northamptonshire, 1.5 km from the Oxfordshire border, St Rumbold's Well (NN002) was an established part of the circuit of springs visited by the well-to-do in the later 17th century (Morris 1947, 32). There was also a short-lived spa at Dorton (BU001), 1.3 km east of Brill, a Buckinghamshire village near the Oxfordshire border in the later 19th century (Brill Village Society undated).

5.9.4 Mineral waters

There were other more commercial operations producing mineral water. Blake & Co. opened a small mineral-water factory (WO153) in Eynsham before 1877 and by 1881 employed four labourers. In the late 19th century the business was moved from the west end of Acre End Street to a factory off Mill Street. The source was a spring in a field

behind Mill Street. The firm produced not only mineral water, but also a wide range of non-alcoholic beverages including ginger beer, football stout and raspberry champagne (Duffield & Atkins 1988, 39). The Mill Street factory closed in the early 1930s, but Maurice Blake, the founder's son, opened a separate mineral-water factory in the Witney Road, and continued in the business until the 1960s. The Mill Street factory was demolished in 1976 (VCH Oxon XII 1990). The Blakes may have chosen their products from temperance convictions or may just have seen a good business opportunity.

The mineral water produced in Chipping Norton was certainly not linked to the promotion of abstinence as it came from Hitchman's Brewery (WO052). The brewery was founded in 1796 and moved to a new, purpose-built site in Albion Street in 1849. The quality of the beer was attributed to deep wells on the premises from which mineral water was extracted and sold (Lewis 2004, 67) and tenants of tied houses were required to use it. Even after the brewery was moved to Banbury in the 1930s the mineral water business continued until 1968, after which the building was redeveloped for housing and shops (ibid, 69).

It is still possible to buy mineral water from Oxfordshire, although it is sold mainly in quantities suitable for water coolers. Blenheim Water was originally obtained from Rosamund's Well (WO 006), a source always regarded favourably. A notice survives in the kitchen of the palace reading 'Remember to fetch from the kitchen the beautiful Rosamund's well water' (Mowl 2007, 63). To meet demand, a borehole was sunk on the estate and a bottling plant erected (Bapasola 2009, 82). The water quality is checked to conform to The Natural Mineral Water, Spring Water and Bottled Drinking Water (England) Regulations 2007. The mineral content according to a supplier's website is given in Table 5.1.

Parameter	Units	Result
pH value	-	7.9
Sulphate	mg SO_4/l	48
Nitrate	mg NO_3/l	0.5
Sodium	mg Na/l	40
Chloride	mg Cl/l	16
Nitrite	mg NO_2/l	0.007
Permanganate	mg MnO_4/l	0.05

(http://www.sunwatercoolers.co.uk/water.php)

Table 5.1: Mineral Content of Blenheim Water

In the later 20th century mineral water increased greatly in popularity. This was driven in part by a suspicion of chemicals routinely used in purifying mains water, possibly heightened by the poisoning of residents in Cornwall in 1988 when a delivery of aluminium sulphate, used in treating cloudy water, was accidentally added into a limited volume of water ready for supply (Rowland et all 1990, 166-72). In addition the claim that drinking around 2 litres of water a day was necessary for health has led to many people keeping a bottle of water constantly by their sides, not usually filled from the tap (McCartney 2011, 343). The water cure has not passed out of fashion.

The prime drivers behind bottled water sales are fashion and marketing. Some mineral water does have a distinctive flavour and sparkling water, both natural and carbonated, offers an alternative to plain tap water. For those who feel they can detect these differences water tastings may provide an interesting social activity (Wright 2008, 91). The size of the market has grown to such an extent that the environmental lobby is

questioning its carbon footprint. Shipping a bulky commodity which is readily available at its destination appears unnecessary (Hays 2008).

Obtaining water from springs does not guarantee its purity and there have been various incidents of contamination. The 2007 Regulations are intended to reduce this risk. In 1988 Perrier Water was found to contain benzene (Fox 1988, 47) and in 2000 faeces were identified in samples from the Chiltern Hills Mineral Water Ltd, (Branigan 2000). Both companies involved moved rapidly to withdraw products and eliminate the causes. Some less ethical breaches of regulations have also occurred, such as the sale of Welsh tap water as Blenheim Water (The Telegraph 2009).

It remains to be seen whether the green movement or concerns over the global water supply will undermine the bottled water business.

5.10 Summary

In rural areas direct access to natural sources such as springs and ponds continued to provide the major source of water for many into the later 19th century, although supplemented by wells from the prehistoric period onwards. Clear differences are found in the level of provision across the social hierarchy whereby more elite groups were provided with a convenient, reliable source. Few examples can be found to show that any consideration was given to extending the supply to ordinary people until the later 18th century. Enclosure at Great Linford, Milton Keynes in the 17th century demonstrates the opposite, when the village supplies (BU008-9) were simply cut off.

From the later 18th century large landowners did consider the water supply of their tenants, for example by providing pumps in planned villages such as Mixbury (CH185) or by extending piped systems as at Coleshill (VW096) and Buscot (VW033, 093). The

motives for this were probably economic, concerned with efficient farming of their lands and maintaining a reliable workforce. Many more examples of the upper classes providing a water supply can be found and, in many cases, the motive for this appears to be genuinely philanthropic, involving clergymen, gentlewomen and even Indian potentates. However, it is not clear what obligations this patronage carried and how much control the benefactor actually had over the lives of consumers. Some examples of public subscription are also found, but again it is not always possible to discover whether access was free. One example where this is known not to have been the case is the well at Kidmore End (SO009).

It is much easier to find out who paid for the installation of new water supplies than how maintenance was funded. As discussed in Chapter 7, provision was in place for the Stoke Row well (SO010).

For rural areas the availability of water was governed by a combination of natural geology and topography with differing patterns of land ownership. Where large areas were controlled by single landowners their influence extended to the access of tenants to a reliable water supply, not always to their advantage, (see Chapter 4). Practical difficulties and economic considerations delayed the establishment of good supplies even after mains water became widespread, leaving some houses outside the network to the present day.

Water carries wider significance than mere necessity for survival. It has always been associated with cleanliness and purity, associations which have linked water with religious activities and rituals. During the post-medieval and modern periods this is manifested in the continued use of holy wells, for both healing and ceremonies. Although Oxfordshire has few wells with genuine pre-Christian origins or even firm links with a

particular saint, a considerable number of these features have been recorded in the county. Several are still in existence and even attract pilgrims (OX007).

Oxfordshire had a very limited involvement in the spas movement which replaced visits to holy wells as medical knowledge increased. There was one public cold bath site (VW046) and a few sources of mineral water, which continues to be produced at Blenheim (WO187).

The aesthetic associations of water are better represented across the county. There are many fine examples within the large estates illustrating how water was used within gardens at different periods. These gardens used water in part as a demonstration of affluence and in part for simple pleasure.

6 WATER IN URBAN SOCIETIES AND LARGE-SCALE USAGE

6.1 Introduction

Away from the City of Oxford, Oxfordshire is a largely rural county, populated by a number of market towns, few of any significant size, as Table 5.1 shows. According to the 2011 Census (http://neighbourhoood.statistics.gov.uk), apart from the Oxford there were only five towns with populations over 20,000, although the combined population of Witney and Grove was 17,612. Three more towns had populations between 10,000 and 15,000.

The lack of large towns is even more apparent when the population of these places in the1901 Census is considered (www.visionofbritain.org.uk). Oxford was the only one where the population exceeded 20,000 while a further three towns had a population over 10,000.

Town	Population in 1901	Population in 2011
Abingdon	17,325	30,626
Banbury	3,394	43,867
Bicester	12,435	28,672
Carterton	-	11,805
Didcot	420	25,231
Henley	3,152	10,646
Oxford	22,896	151,900
Thame	2,911	11,039
Wantage and Grove	4,346	17,612
Witney	19,283	22,765

Table 6.1 Population of Oxfordshire Towns

The adjacent historic county of Buckinghamshire contains two towns with populations in excess of 100,000: High Wycombe (118,219) and Milton Keynes (210,962), now a separate unitary authority. There are only two more towns with populations over 20,000 and six between 10,000 and 20,000. In an example of a rural county from a different part of England, a similar pattern is seen for Cheshire, with two populations over 100,000, five more over 20,000 and three between 10,000 and 20,000 (various Local Authority websites). It would seem that Oxfordshire is a fairly typical rural county, although its towns are generally smaller and it has only a single large centre of population.

In Oxfordshire the changes in population over time are particularly striking for Didcot and Carterton. Didcot was transformed by the coming of the railway, and later benefitted from the development of the power station and the research centres around Harwell (Lingham 1992). The latter was a deliberate new foundation from the early years of the 20th century, which later grew as a result of its location next to the Brize Norton RAF station and good communication routes to established centres (Carterton Heritage Group, 2009). The figures for Witney represent an opposing trend. The general increase in population has to a large extent been offset by people leaving because of the death of the wool and blanket industry in the town (Jenkins 2010).

The lack of large towns within Oxfordshire means that there were limited instances within the county of many of the large scale developments in water supply in urban areas which took place during the 19th and early 20th centuries. Of these, even fewer have survived and, therefore, in order to cover the relevant issues, examples from further afield are used.

Redevelopment and improvement work have been much more extensive in urban than in rural areas, and the level of survival of post-medieval water features is relatively low, particularly those associated with people's homes. This chapter has therefore had to make extensive use of the historical record and secondary source material.

6.2 Urban Water Works into the early 20th Century

Some town water supplies had been established in the medieval period, either by religious institutions or by town authorities. However, the available technology limited their provision to areas where there was an easily obtainable source of water, either a river or sufficient springs (see Chapter 3). For the majority of urban dwellers, wells continued to be the principal water supply into at least the second half of the 19th century.

By the 19th century increasing population densities, changing social attitudes to cleanliness and alcohol use and awareness of the links between pollution and disease made improvements in water supplies more of a priority, facilitated by advances in pumping technology, particularly using steam power (Barty-King 1992, 75). However, such improvements carried a significant cost and there were concerns that householders would not be prepared to abandon their free wells in order to connect to and pay for a piped supply, in Thame for example (Brown & Guest 1935, 250). Local authorities were concerned about the demand on the rates and private water companies needed to make a profit, both usually having loans to service. Even after the necessity of improvements had been admitted there were severe delays before a project came to fruition.

Some improvement work had been carried out before the 19th century. Oxford had replaced its early 17th-century conduit (OX016) (see Section 6.6 and Chapter 3) with a

water works on the River Thames (OX015) in 1696, operated by an undershot wheel. This was relocated across the river to what is now Isis Street (OX022) in 1825 and an additional waterwheel was added (Crawley 1947, 93-4). However, a system capable of supplying the whole city was not constructed until the 1850s, when severe outbreaks of cholera overcame the financial reservations of the city authorities (ibid, 95). A new plant was constructed in Lake Street (OX019) linked to a storage reservoir in Headington (OX004) (see Section 6.6).

In Abingdon the supply from springs in Albert Park (VW001, VW101) was inadequate by the late 17th century and Thomas Piccard, a goldsmith, leased ground in Stert Street from the corporation in 1696 to build a new conduit (VW086) to be fed with river water and an eyot close to Abingdon Bridge was leased to house the pumping station (VW085). Little is known about the success of the scheme, but the lease continued until 1819 when bridge widening began. The engine-house was last recorded in 1837, but may not by then have been supplying the town (Baker 1963, 107-9). From 1877-8 the town had a waterworks and underground reservoir (VW088) at Wootton to its north-east, no trace of which now remains (Hammond 1979, 116). This was supplemented by gas-powered pumps in the basement of Abingdon Town Hall (Plate 6.1a) in 1902 (Bowen 2012).

The positioning of waterworks some way outside the town is not unusual and such systems were seen in Thame (SO018), Burford (WO179), Wantage (VW006) and Chipping Norton (WO188). The last town commissioned Rowell and Sons in 1877 to supply water from springs at Glyme Farm, to the east of the town. There was a sterilising plant at Old Chalford (WO189) and a pair of reservoirs was constructed in 1878 and 1896 (Chipping Museum archive, unaccessioned). The town still has a water tower (WO125), which is a later rebuilding on the same site.

Water towers were, and continue to be, used for storage in towns and rural areas. The early ones were usually fairly ugly steel tanks on a brick or steel supporting frame. Most of these have been demolished or rebuilt, as at Chipping Norton (WO125) and Wallingford (SO094) (Plate 6.1b), where mains water was established in 1885 (Dewey et al. 1989). Thame (SO093) had a steel tower, while those demolished in 1972 at Dorchester-on-Thames (SO172) and Bicester (CH064) were brick, one rectangular and the other round (Heritage Search). In the same year Eynsham also lost its brick tower (WO075), used since 1903, (VCH Oxon XII 1990, 110-5) and another was demolished in Didcot (SO177).

The wells in Witney had been inadequate for many years and at the beginning of the 20th century a new deep well (WO071) was sunk in the Windrush valley to supply the town. The water was pumped to a water tower (WO062), proudly marked with the names of the Urban District Council, at the top of what is now Tower Hill. Unfortunately within six months of inauguration the tank burst (Plate 6.1c), an event recorded in the local paper and on postcards, complete with poem (Appendix 1).

A new, larger tank was constructed, but in July 1905 this also burst, within a week of completion, inspiring a memorial poem (Appendix1). The third tank was more successful and was used into the 1930s. As connection to the mains had to be paid for by property owners, take-up was gradual with around 481 houses connected by 1905, but many others and the National School only took up the supply in the 1920s (Scott 1983, 14). The tower has been demolished, but the site of the pumping station near Apley Barn has been in constant use as a depot, although not recently for water-related purposes. The new waterworks (WO071), built in 1936, was located at Worsham to the west of Minster Lovell with a covered reservoir close to it. The waterworks buildings have been converted for residential use, but there are still sludge lagoons on the opposite bank of the

River Windrush.

Henley's first waterworks were in fact located in Berkshire, on the opposite side of the River Thames. The pumping station and reservoir (BE008) were within the grounds of Park Place, a large private estate. A private company sponsored by the MP W H Smith opened new waterworks (SO008) (Plate 6.1d) in 1882, the first to adopt Atkins System for Softening and Purifying Water (Kelly's Directory 1907). The opening ceremony on 17th June was attended by several MPs, government officials and representatives from several other water companies, including Southwark & Vauxhall and Swindon. The last group may have been invited as prospective customers for the Atkins System.

Burford also benefitted from the latest technology at its plant using a particular kind of water-wheel driven plunger-pump (WO179) to obtain water from the River Windrush. The pump was probably designed by William Hemming and installed on behalf of his company by Charles Kent. The pump was finally replaced in 1957 (Macaulay 2000, 17-8). Like Henley, Burford was supplied by a private company. Other private water companies were the Charlbury Water Works Company (WO185) founded in 1896 by the Albright family (Stevenson 1977, 102) and the South Oxfordshire Water and Gas Company, which had a plant at Cleeve in Goring (SO152) and from 1906 a reservoir at Woodcote (SO130) (Graham-Kerr 1982, 51).

The Banbury Waterworks Company had been formed in 1854, with an extraction and purification plant on the River Cherwell at Grimsbury (CH014) and a reservoir in the south of the town (CH249) (VCH Oxon X 1972, 83). Purification was carried out using sand filtration. Additional reservoir capacity was added by 1914 and a further increase was made after World War II. The Neithrop Water Tower (CH103) in the east of the town was added *c* 1964 and a new reservoir was built at Grimsbury (CH230) in1965,

when the population of the towns was growing considerably. The local authority opted not to buy the company in 1863, fearing rate increases and was also reluctant to impose connection to the mains, as advised by the District Medical Officer in 1870, because the increased cost and loss of civil liberty would have upset public opinion. Ownership was finally transferred in 1947, although the local council had already taken over several smaller water undertakings in the area, such as the Bloxham and District Water Company (CH284) in 1937 (*ibid*, 71-89).

Oxfordshire's new towns were slow to develop their water supplies. In 1839 the Great Western Railway arrived in Didcot and by 1844 the town was an important junction. The need for homes for railwaymen led to a housing boom met by local speculative builders, but no provision was made for either running water or drainage. By 1883 the wells and cess pits were in such poor condition that a Special Sanitary District was created. Sewage works opened in 1898, but piped water was not installed until 1900-6 (Lingham 1992, 59-62).

The founding of Carterton was a more calculated move on the part of William Carter, who wanted to attract people to smallholdings. The settlement grew rapidly with a good reputation for its produce, before being transformed by the opening of RAF Brize Norton on its south side in the 1930s. Although the building of Carterton began in 1894, with tin and asbestos bungalows, a tin mission church and from 1911 a community hall, no provision was made for a water supply and settlers had to dig their own wells. Mains water did not reach the settlement until the 1930s. (Carterton Heritage Group 2009).

These examples demonstrate how reluctant many local authorities were to assume responsibility for ensuring that their constituents had adequate clean water, despite the Public Health Acts of 1875 and 1878 (Hall 1989, 18). The fears expressed by the

Banbury Local Board of Health and Banbury Council given above about the perceived burden on the rates were typical.

As discussed in Chapter 3, during the 20th century local water companies were gradually amalgamated to form the Oxfordshire and District Waterboard, now part of Thames Water (VCH Oxon IV 1979, 355). The waterworks sites have met a variety of fates, many disappearing altogether. A few are still in existence as part of the Thames Water network, Henley (SO088) for example, but the survival of its building is unusual. At Wantage (VW006) there is a new, modern pumping station (Plate 6.2a) and at Goring (SO152) the plant has been updated. There is a new reservoir at Woodcote (SO128) (Plate 6.2b), but the offices have been sold for housing. The building in Oxford (OX019) is now a leisure centre, incorporating the former treatment and collection ponds. Banbury's Grimsbury waterworks (CH014) were demolished in 2000.

Unlike many parts of the country, Oxfordshire has been able to supply enough water for its needs from local sources, using a mixture of boreholes and the River Thames with its tributaries. The largest reservoir is at Farmoor (VW038). The first reservoir on the site was constructed in 1967 from former gravel pits. Construction work for a new reservoir began in 1974 in two stages, the second of which re-used the early site (Vick undated). Although construction destroyed archaeological features from the prehistoric and Roman periods, the loss of land had a limited impact on local inhabitants. The same cannot be said for some of the huge reservoirs constructed some considerable distance from the large cities they supply. When the Ladybower (DE002) and Derwent (DE003) reservoirs were finished in the 1940s the villages of Ashopton and Derwent were drowned and the villagers displaced (Naylor 2006, 46). The water supplies Derby and Leicester.

Even the largest of Oxfordshire's waterworks were comparatively small in comparison

with many across the UK. Some of these have survived as museums, where steam pumping engines are occasionally operated. The Kew Bridge Steam Museum (LO005) is the largest of these (Roberts 2006, 159), where the collection includes a Kay beam engine from Dancers End, Buckinghamshire (BU004). The Dancers End waterworks was built for the Chiltern Hills Waterworks Co and supplied the large Rothschild estates nearby (Hepple & Doggett 1994, 211). The pumping station is still used by Thames Water.

For most of those in power, commercial enterprise combined with voluntary contributions was seen as the ideal way of managing public affairs. There were those who viewed the growth of municipal responsibility in a different light and worked towards a concept of civic pride in which the town's identity was linked to its elected officials. In some areas this extended to water supply, although there is no evidence for this in Oxfordshire. Neither the Bertie family (Earls of Abingdon) nor the Morrell family, despite their long record of service as Members of Parliament, were involved in the drive for improved supplies. However, the Dukes of Marlborough were important in the provision of clean water in Woodstock (see Chapter 5).

The leading exponent of this civic pride movement was Joseph Chamberlain, who as mayor of Birmingham from 1873 established the city's supply (Hunt 2004, 250-2). In 1880 the Chamberlain Memorial Fountain (WM003) was erected in Chamberlain Square, its cost offset by channelling the water to supply the nearby market (ibid, 264).

6.3 Population, Disease and Legislation

Human waste, like animal excrement, can easily be absorbed by the environment in limited quantities and indeed can make a valuable contribution to fertilisation of the soil. However, where large numbers of people live in close proximity and with little open land

available, the waste soon presents a problem. During the medieval and much of post-medieval periods cess pits were dug in the rear of housing plots or even in cellars, from which the waste was collected for removal from the town by nightsoil men.

In earlier periods, waste was also dumped in the streets where it could be washed away by rain. Castle Street (OX122) and High Street (OX121), Oxford both had a kennel or open drain running down their centre from the late 11th century, the remains of which have been found in excavations (Dodd 2003, 56). These drains and sewers were built to prevent flooding rather than for disposal of foul waste. This changed after water supplies in towns improved and water closets came into common use. Cesspits were unable to cope with that volume of waste and tended to overflow so from 1830, in London at least, it was an offence for a newly constructed house not to have the cesspit directly connected to a foul sewer (Mayhew 2008, 245). This regulation did not of course address the problems of existing buildings. Banbury's sewage system (CH251) was installed in the 1850s, but Oxford's (OX087) was not updated until 1870.

Although sewers represented a great improvement, they all emptied in to rivers. The assumption was that the flow of water in the rivers would remove the waste which would be diluted and then rot away. In the case of London the influence of the tides on this flow was not appreciated and the sewage was not dispersed. The discharge point needed to be well downstream, but it was not until after the 'Great Stink' of the summer of 1858, which made the Houses of Parliament unbearable, that Sir Joseph Bazalgette was commissioned to build a new system. The sewage was sent under the newly constructed embankments along the river to pumping stations at Abbey Mills (LO006) and Crossness (LO007), which still survive (Halliday 1999, 99-100).

Until the bacteriologist Robert Koch identified *vibrio cholerae* in India in 1883 and

proved that the organism was spread in water, many people believed that cholera was caused by a miasma or bad air, rather than drinking water contaminated by faeces (Halliday 1999, 125). The disease had first reached Britain in 1831 and caused a series of epidemics in 1831, 1848-9, 1853-4 and 1866, although this last fortunately did not extend into Oxfordshire (Gibbs 2012).

The treatment of human waste described so far in this section set up ideal conditions for the transmission of cholera. In Oxfordshire the outbreaks of the first three epidemics listed above were most severe in Oxford, although there were outbreaks elsewhere, for example in Blackthorn where 27 people died in 1832 (VCH V 1957, 15-30). Following the 1854 epidemic, Sir Henry Acland, Regius Professor of Medicine at the University of Oxford (Figure 6.1), investigated instances of the disease in the surrounding area distinguishing cases arising from contact with Oxford from apparently unrelated outbreaks, both in towns such as Banbury and in small villages, but the numbers were small (Acland 1856, 40-1).

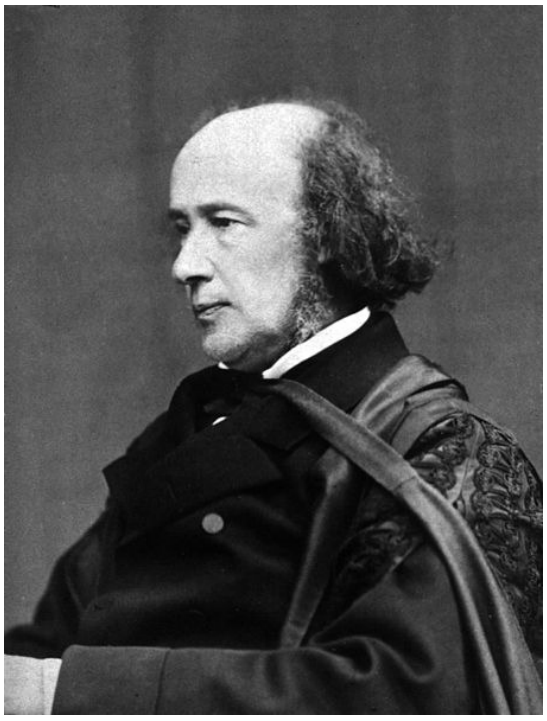


Figure 6.1: Henry Acland (Wikipedia Commons)

Each epidemic in Oxford was tackled by a Board of Health, with reports published after

the event. In 1831-2 out of 172 recorded cases, 86 victims died, with the parish of St Clements particularly badly hit. Oxford Prison also had a large number of cases. (Ormerod 1848). In the subsequent outbreak the death rate was 75 out of 144 cases, but St Clements was largely unaffected. This was probably because a new water supply, using a spring on Headington Hill (OX110), had been established by 1833 (Cox 1870, 269). Ormerod (1848), a surgeon at the Radcliffe Infirmary, had highlighted the poor drainage in the city, with open sewers clogged by sewage and other rubbish, particularly animal bones and manure. In 1848-9 some effort was made to clear this (Gibb 2012).

The outbreak of 1853-4 was the most serious, with 115 deaths from 194 recorded cases. It was also the most closely studied by Acland who accumulated and published detailed statistics on the distribution of cases, the weather and the topography and environment of areas where they occurred (Acland 1856). A clear association between the disease and low-lying areas emerged, potentially an argument in favour of a miasmic cause, but Acland was unwilling to settle on a single cause. In some cases, he acknowledged the link between water supply and cholera, promoted by John Snow of London, whose work he knew. Like Snow, Acland mapped individual cases (Figure 6.2). At the County Gaol, inside Oxford Castle, four fatal cases of cholera had occurred in 1854, while there had been 3 cases in 1832 and 14 in 1849. Visiting the gaol in 1854, Acland found that water from the prison was being abstracted about 3 metres downstream from the stagnant mill pond into which the prison drains emptied. The intake pipe was immediately shut off and the epidemic at the prison ceased (ibid, 51-2). The City Gaol, on the site of the modern bus station, had been unaffected in all three epidemics.

John Snow had carried out two epidemiological studies in London, which indicated that cholera was a water-borne disease. The most famous is the case of the Broad Street pump, where he was able to show that cholera was occurring in people who could be

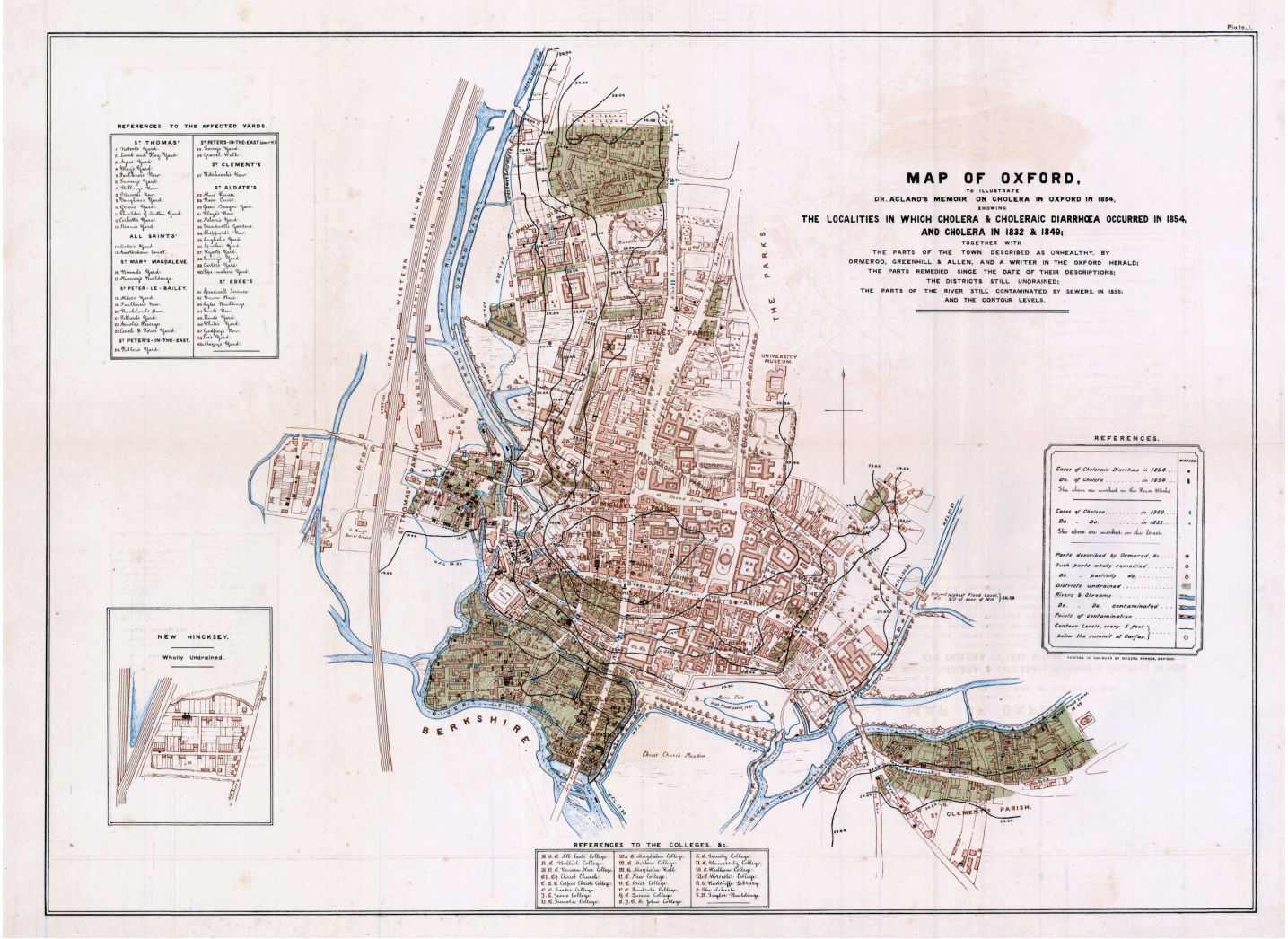


Figure 6.2: Acland's Map of Cholera in Oxford (Acland 1856)

shown to have consumed water from a specific street pump. This included one woman living some distance away, who had water from the pump delivered (Hempel 2006, 212-8). Once the pump handle was removed the epidemic ceased, although some argued that it was already on the wane and that Snow had not disproved other possible causes (Hamlin 2009, 189). Snow is remembered in the name of the local public house, outside of which the site of the pump is marked (LO001) and by a replica pump (LO002) further down the street.

Snow also noticed that there were differences in the levels of cholera seen in parts of south London between the 1848-9 and 1853-4 epidemics. Those areas were supplied by two water companies, the Lambeth Water Company and the Southwark and Vauxhall Company, who both obtained their supplies until 1850 from the polluted River Thames in central London. By 1853 the former company had begun to get water from Thames Ditton, some distance upstream. In the earlier epidemic those supplied by both companies got cholera, but Snow showed that cases in the later one were from areas supplies by Southwark and Vauxhall (Hempel 2006, 164).

Modern scientific research has vindicated Acland's reluctance to settle on one particular cause for cholera. While water borne micro-organisms play an important part in transmission, the situation is far more complex and pre-disposing conditions, low-lying areas, weather and other factors are also implicated (Hamlin 2009). However, the idea that cholera was sent by God as punishment for sin is no longer credible. In 1832 the Chairman of the Oxford Board of Health, Vaughn Thomas, the vicar of Yarnton, wrote that cholera illustrated 'the reality of the universal law of providence, whereby sin produces its own punishment...' (Morris 1975, 258). In 1853 he published advice to his parishioners, which fell into two parts: the first advising them to pump out their gutters daily and to limewash their walls (materials available from his housekeeper at a

discounted price), and the second consisting of a series of prayers (Thomas 1853).

Despite the uncertainty over the cause of the cholera and its means of transmission, those involved in Oxford's three epidemics were clear that the city was in desperate need of improvements to its water supply, drainage and waste disposal. After many years of debate and prevarication, the necessary improvement work eventually began in the 1850s (Morris 1975, 260) (see Section 6.6).

The waterworks at New Hinksey (OX019) and reservoir on Headington Hill (OX004) are the nearest Oxford has to a memorial to those who suffered in or dealt with cholera. The areas where it was most prevalent have mostly been subjected to slum clearance programmes and the prison has been closed. Cholera study was not Acland's only contribution to the city, as he was one of those who created the University Museum (Oxford Museum of Natural History undated), but there is no dedicated memorial to him. London recognises Snow (LO001) and Bazalgette, whose memorial (LO008) stands on the embankment he built. Even the Acland Hospital, opened by Acland in memory of his wife, is now just the Acland site of Keble College.

6.4 Philanthropy and Social Obligation

Charitable work is expected to be within the remit of religious organisations, while individuals have contributed for a variety of reasons, including a desire to earn salvation. As some Protestants in England thought deeply about their religion and church teachings, the evangelical movement began to emerge, becoming more organised following Wesley's formation of the Methodist movement in the 1730s. Evangelicals moved away from ritual to a more personal, active pursuit of Christianity, based on personal conversion, regard for biblical authority, the saving death and resurrection of Jesus Christ

and sharing and spreading of the gospel. This last became closely entwined with moral improvement and good works. These had three motifs: discrimination in giving, personal contact with the poor, fostering of self-help (Kidd 1979, 71-4).

The motives for charitable giving have always been complex, the view of future benefit to the giver not confined to the afterlife. A decently-housed work force is more likely to be industrious and stable, one reason why many large manufacturers (not in Oxfordshire) built model villages for their workers, Bourneville (WM001), near Birmingham by the Cadbury family and Port Sunlight (ME002) on the Wirral by Lord Leverhulme (Darley 1994, 140). The Cadburys were Quakers, a sect very active in social reform. The sense of duty increased, and obligation to public service, whether at local or national level, during the Victorian period could be seen as equal to the profit motive (Briggs 1983, 237). Among the less worthy motives attributed to philanthropists were a fear of the poor, and a belief that the order of society was divinely ordained and more or less immutable, in which the poor should be comfortable, but more importantly pious (Owen 1965, 95).

The impact on the poor of the combination of moral superiority, patronising attitudes and gospel-spreading which accompanied charity is recorded, but the 19th century also saw a growth in political awareness and activity in the lower classes. One element in this was the Chartist movement, which campaigned on many fronts including universal suffrage (Briggs 1983, 198). Another was providing opportunities for urban workers to return to the land on their own small-holdings. The Chartist Land Company was founded in 1845 to purchase and build a series of settlements to allow this. Shares were sold through weekly subscriptions and places in the completed settlements allocated by a ballot of shareholders.

One of five Land Plan estates was built at Minster Lovell in 1847-8, in the constituency

of the Chartist MP, Fergus O'Connor. He purchased 300 acres on which 78 dwellings and a school house were constructed. Although there were only three wells (WO194), each house had iron gutters which channelled rain water into a sunken indoor storage tank. The scullery housed a pump and a copper (Tiller 1985, 254-5).

Charterville was only one of a number of attempts to found new settlements on socialist principles, such as those of Robert Owen. It was not wholly successful, the result of plot holders' inexperience in agriculture and the company's unsound finances, which resulted in evictions in 1850 and the sale of plots (Tiller 1985, 264). However, new owners were more successful and most of the cottages survive along with their original plots.

By the 19th century, most social welfare was administered through parish authorities, as poor relief and later the workhouse system. The regime was harsh and humiliating to recipients, with an underlying belief that those in need of help had brought it on themselves. Groups like the Clapham Sect strove towards moral improvement of the working classes, which included a reduction in their dependence on alcohol (Midgeley 2007, 52).

The quality of drinking water was generally very low, particularly in larger cities such as London, and this contributed to outbreaks of disease including cholera. However, the poor water quality also encouraged consumption of alcohol. In 1859 the Metropolitan Free Drinking Fountain Association was founded with the aim of providing a readily available source of clean drinking water. The first fountain (LO009) was on the wall of St Sepulchre's Church, Snow Hill, London where it survives, although without a functioning water supply. Within two years, 85 fountains had been erected (DFA 1996). Despite the organisation's name, it erected fountains across Britain and in overseas locations. The association continues to operate, although now under their short name

'The Drinking Fountain Association'.

Oxford benefitted twice from the society's generosity, an earlier iron trough which had been moved to the railway station (OX086) was replaced on Abingdon Road in 1931 by a stone trough (OX008). The replacement feature had facilities for cattle and dogs (DFA archive: 2482 Book 3), but only appears on 1930s Ordnance Survey maps. The fate of both troughs is unknown. From early in the society's activities drinking troughs for dogs were often included and in 1867 its name was changed to include 'and Cattle Trough'. The change was prompted not only by a concern about animal welfare, but also temperance. At that time animals could only obtain water from troughs outside public houses, a service for which publicans expected to be paid through patronage of their hostelries (DFA 1996). Other troughs identified in Oxfordshire include examples in Thame (SO148) (Plate 6.2d) and Banbury (CH025) and the association is named among the sponsors of the restoration of the North Aston drinking fountain (CH016) (Plate 6.3a).

The temperance movement has also left heritage in the form of Temperance hotels, the first of which was opened by Joseph Livesey of Preston in 1833 (Weston 1884, 55). The Banbury Temperance Hotel is now part of the bus station and two of three recorded in Oxford are still standing, Dodson's (OX125) on the Botley Road (Plate 6.3b) and Castle's (OX126) in Park End Street, both close to the railway station (Beckley & Radford 2011, 17). Although no longer Temperance the former has become the Westgate Hotel. Oxford also had Temperance facilities supported by the British Workman movement, at 98, St Clements (OX127) and 67, Old High Street (OX111), Headington. This movement began in the 1860s in the north of England. The Headington building was funded by the efforts of two local women and opened in 1880, replacing a smaller cottage used from 1876 (Anon 1881).

Much philanthropic activity was focused on the living conditions of the working classes, and promoted the construction of large tenement blocks. With few large towns in the county, the examples from Oxfordshire are confined to two blocks constructed for Christ Church in Oxford. Christ Church Old Buildings (OX099) (Plate 6.3c), which are still standing, were constructed in 1866-7 in St Thomas's parish to replace crowded cottages where one privy served 6-7 families. The new tenement had three floors and four staircases, surrounding a central playground and drying area. The sizes of the accommodation varied, but each had a WC and a sink in or off a scullery (Bruton 1868).

The second phase, New Buildings (OX100), was more ambitious with seven sections planned, although only three were built and all were demolished in the 1990s. Again the accommodation varied to fit different sized families and in addition a laundry was installed on the top floor. This held two coppers, a sink and the main cistern, which was used to flush a 'washout', urinal and slop sink, in the WC of each dwelling. This was off the scullery in which was a sink and water supply (Hoole 1893). The accommodation provided would have been regarded, as is shown below, as high quality.

Working class living conditions were the subject of a number of intensive surveys. Henry Mayhew, a journalist and publisher, published 'London Labour and the London Poor' in 63 weekly parts in 1850-2, later republished in book form. This was not a scientific survey, but his series of interviews gives a vivid picture of life and living conditions in the capital (Mayhew, 2008, xv-xvi). Other surveys, with a statistical basis, were also being produced in the mid 19th century, for other cities such as Manchester, not just London (Burnett 1978, 66). Edwin Chadwick published with Dr Thomas Southwood Smith 'The Sanitary Condition of the Labouring Poor' (Chadwick 1842). Although legislation was enacted with the aim of improving the standard of dwellings, such as the Common Lodging Houses Act 1851-3, the scale of the problem and pressure for

accommodation was immense (Burnett 1978, 64).

Among those prompted to carry out philanthropic work was Angela Burdett-Coutts, from the banking family (Healey 1978, 122) and George Peabody (Porter 1994, 330). Many of the Peabody Estates are still occupied and have been designated Conservation Areas (City of Westminster 2008, Lambeth council 1999).

By the end of the 19th century new accommodation for the working class was generally provided by private companies, who planned their improvement work to provide a good profit. This was dubbed 'five per cent philanthropy' (Tarn 1963). Names such as 'The Society for Improving the Conditions of the Labouring Classes' founded by Lord Shaftesbury and 'The Metropolitan Association for Improving the Dwellings of the Industrious Classes' tend to disguise the profit motive (Porter 1994, 329-31).

The move towards housing companies away from private philanthropy is a reflection of a more general movement towards more controlled charitable giving and closer partnership with state provisions. As charities and charitable work proliferated so did concern that it was too indiscriminate and needed to be better focused on those deserving help rather than encouraging idleness. This led to the creation of the Charity Organisation Society in 1869 (Kidd 1999, 97).

Many of the new houses were built in the form of tenements, and the quality of water provision and drainage varied considerably. When Charles Booth published his 'Life and Labour of the People in London' in 1892, it included 'poverty maps' showing the distribution of London's housing across six levels of income, ranging from "well-to-do" through to "very poor", the lowest class. He also inspected block dwellings, which were placed in four categories, according to their type of ownership:

I - philanthropic, not for profit; II - trading company or private ownership, profit ; III - individual private owners or unknown landlord; IV - employee housing.

He found the first category to have the best sanitary provision, although there were good examples in the others. Within his report he described five classifications for sanitary provision, Table 6.2, and produced statistics for how many of each ownership group fell into each (Booth 1892, 6-16).

Sanitary standard	Facility level	No of Type I tenements	Notes
Very good	Separate WC and water in each tenement, with protection from sewer fumes or equal accommodation conveniently and discretely positioned	41	
Good	WC and tap for each tenement but on balcony or landing; good facilities shared by 2-3 tenants	60	Most Peabody buildings
Fair	WC and tap shared by four tenants	4	
Bad	Scullery on landing with tap and two WC, in defective state; sink and WC shared by six tenants	1	
Very bad	Sink and tap on each landing, WCs in basement; two open closets and one tap on landing for ten tenants.	0	

Table 6.2: Booth's survey of sanitary standards

Booth also included some comments on baths. The first baths in Peabody buildings were in the basement, but hot water had to be brought down by the bather, so they preferred to pay to use public baths, and many of the bathrooms were closed or opened only in summer. Other organisations provided baths within washhouses, where there was a

copper, or provided hot or cold baths on one floor for a small charge (Booth 1892, 26-7).

Booth's work studied London, but it is likely that the pattern was repeated across the country. Both of Oxford's Christ Church tenement blocks (OX099; OX100) would have been classed as 'very good' on Booth's scale.

6.5 Bathing

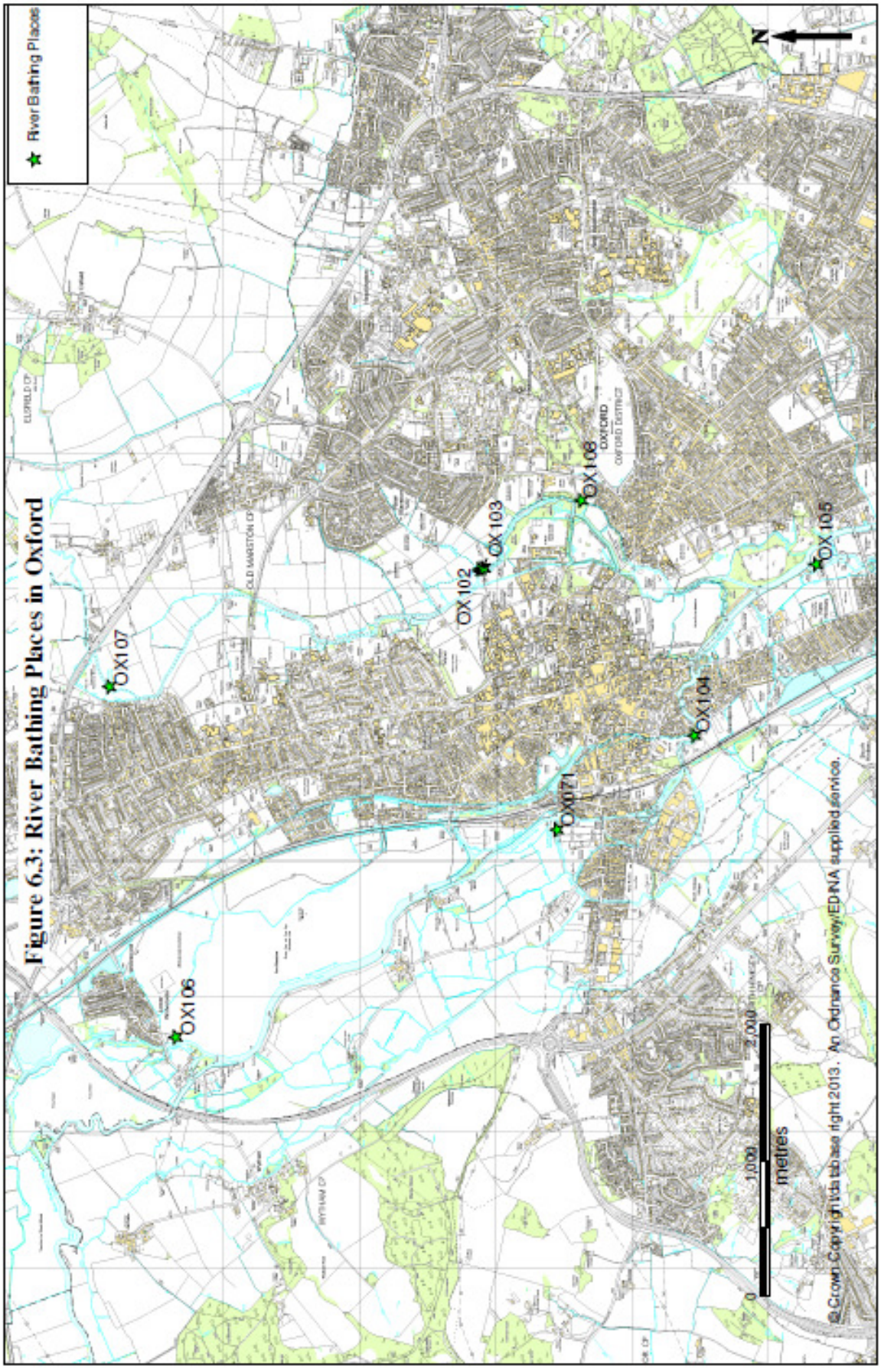
Discussions of housing for the working classes in Chapter 7 illustrate how few were equipped with fixed baths supplied with hot and cold water until well into the 20th century. Public bathing had been a feature of medieval England, but the bath-houses developed a reputation for immoral behaviour and were closed down in the 16th century. For a long period public bathing only took place at spas such as Bath (SM001) (Ashenburg 2007, 95). During the 18th century the inland spas began to lose their popularity in favour of sea-bathing, which was originally done nude, at segregated beaches. Bathing for cleanliness gradually became more common among the middle and upper classes, in hip baths and then in fixed baths following the advent of piped water (Calloway 2005, 264). As this luxury was not provided to most ordinary people, bathing was rare. A doctor in Chipping Norton described visiting one family where walls, sheets and patients were all black with dirt (Ashenburg 2007, 173).

Swimming in natural water sources had always been popular, often at particular bathing places. Oxford had a famous example on the River Cherwell, at Parson's Pleasure (OX102), where members of the university swam nude from the 16th century until the 1990s. A fence was erected to screen the sight from women disembarking from punts. In 1935 a similar facility, Dame's Delight (OX103), was established in the same area for women and children, not for nude swimming (VCH VI 1979, 425-41). Although Oxford City Council closed all bathing places on the Thames in 1990, the remains of several are

still visible. Most were built in the 19th century for ordinary townspeople (Figure 6.3). Changing rooms, steps and even toilets were erected. The St Ebbe's bathing place (OX104) was established in 1846, but totally destroyed in the rebuilding of the area in the 1960s (sites.google.com/site/derelictionintheshires/leisure-sites/, undated). The first opened by the city authorities was Fiddler's Island in 1852 (OX106), followed by Tumbling Bay (OX071) (Plate 6.3d) in 1853 (VCH Oxon IV 1979). It is not clear whether the bathing places were closed for reasons of finance, health and safety or fashion. The construction of wave machines and flumes (water slides) in many newer pools was fashion driven.

Other towns in the county also established river bathing places. Witney bathers were provided with huts on the River Windrush (WO196) (Worley 1981, 152-3). There was also a lido (SO132) on the River Thames at Benson in 1943, established to serve the troops from nearby RAF airfields during World War II. The site is now only marked by a plaque inscribed 'Spitfire Fountain, presented by the Benson Services Canteen 1944' (Young 2004). After the war the Rivermead leisure facility with paddling pool and diving boards (SO131) was established on the same stretch of riverbank.

Oxford's first swimming pool opened in St Clement's in 1827 (OX088) (Plate 6.4a). Richardson, the proprietor, produced very elaborate plans for the pool and its portico, but it is unlikely that these were fully realised (Koenig 2010). The establishment had its own steps on the bank of the River Cherwell for customers arriving by boat. There were also hot baths and showers, fives courts, a reading room and after 1866 a Turkish Bath. It was not a commercial success and the baths closed in 1881 (Graham (3) 1974-88, 10). The University of Oxford opened baths and a gymnasium (OX096) in 1841 (Stevenson 1977, 84).


River Bathing Places
Figure 6.3: River Bathing Places in Oxford
OX107
OX106
OX102
OX103
OX108
OX105
OX104
OX071
N
0
1,000
2,000
metres
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Plans were also published in 1855 for an unusual design of swimming bath in Banbury, with a circular boys' pool in the centre, surrounded by buildings for dressing rooms and private baths, itself surrounded by an outer ring men's pool. It is not known whether this design was realised, but public baths (CH231) did open shortly afterwards, surviving until 1867 (Smith 2005, 15).

Oxford seemed reluctant to provide bathing facilities extending to swimming pools, possibly because there were ample riverside bathing places. Indoor facilities were limited to use shared with the university of the Merton Street pool (OX096) from 1870 until Temple Cowley Baths (OX109) were opened in 1938. The Merton Street facility had been founded in 1869 as a subscription club. Open-air pools were created at Sunnymede (OX107), in the north of the city, in 1935 and at Hinksey Pool (OX070) in 1936 when the former filter beds were converted (VCH Oxon VI 1979, 4). These are still operating. The only Victorian pool still in existence, now the North Wall Arts Centre, was built for St Edward's School (OX135) (http://www.thenorthwall.org/history.php).

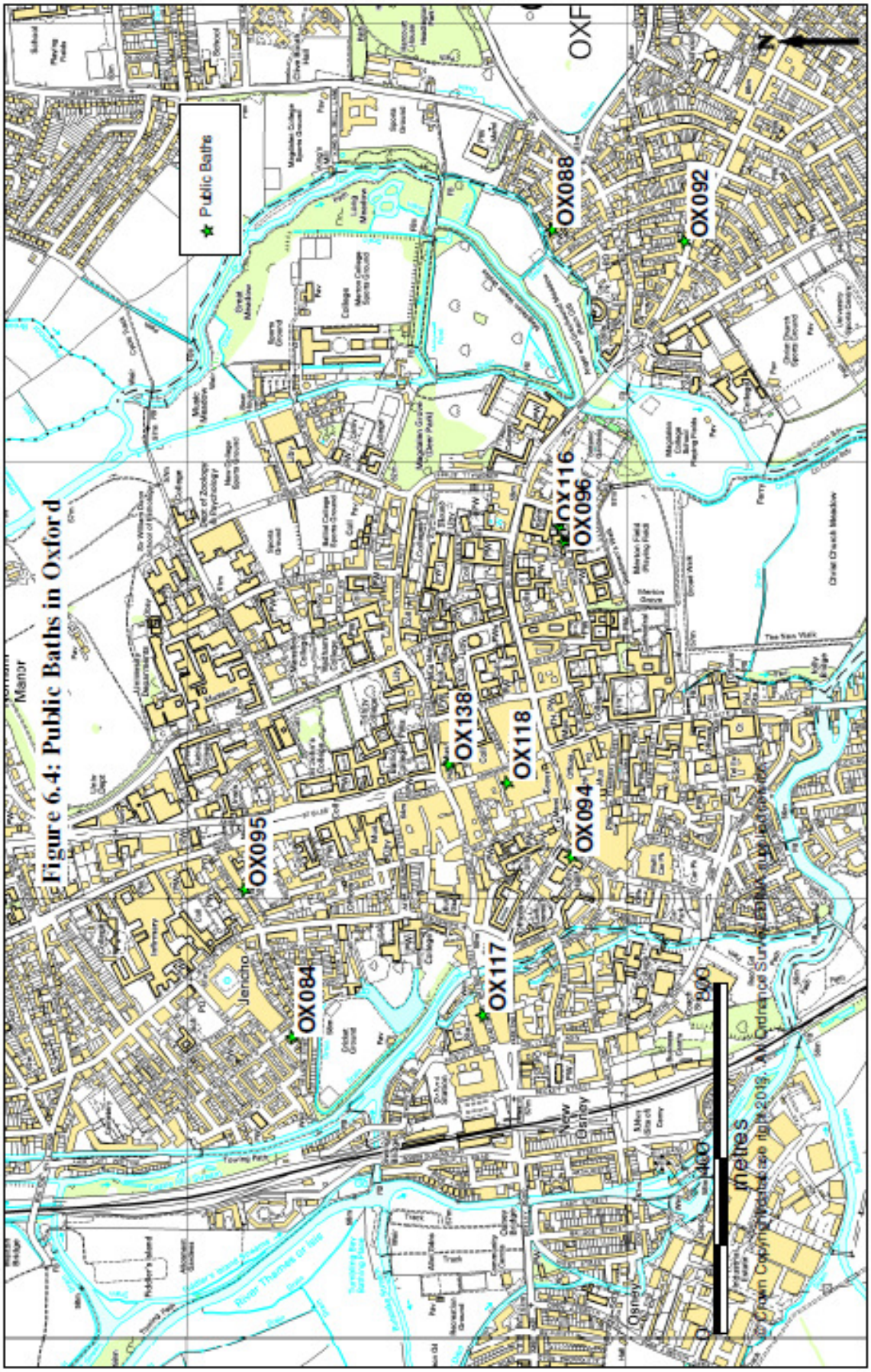
Elsewhere in the county swimming pools were more common. New open-air baths (CH231) opened in Banbury in 1869 run by a private company, but the council took them over in 1889 (VCH Oxon X 1972, 87). An outdoor pool, of Olympic standard length, opened at Woodgreen in 1939, and an indoor facility adjacent to it in 1994. Public support has kept several open-airs pools in operation, including those in Abingdon (VW056), Wallingford (SO133) (built 1950s), Woodstock (WO150) and Chipping Norton (WO178) (built 1970) (Merrington 2007).

The history of swimming pools, particularly indoor pools, from the 19th century became very closely linked with that of baths and wash-houses. In urban areas streams and rivers

were overcrowded and their use for bathing was often prohibited to prevent public nudity, thus restricting their contribution to cleanliness. Overcrowding and poor hygiene were seen to be contributing to the regular outbreak of disease, but provision of bathing facilities was slow and piecemeal, a result of private philanthropy, local authorities and private companies (Marino 2010, 35).

An Association for the Establishment of Baths and Washhouses for the Labouring Poor was established in 1844, which led to Sir Henry Dukinfield's Public Bath and Wash House Bill two years later (Gibson 1954, 396). In Oxford subscriptions were sought in 1850 for 'Wash-house and Baths for the Industrious Classes of Oxford'. This was expected to be profitable, attracting a better class of clientele, both male and female, to separate facilities within the same building (Cox 1870, 368). It proved over-optimistic and the premises (OX094), which opened between Castle Street and New Road in 1852, closed in 1867 (VCH Oxon IV 1979). The city did not open its own baths until 1923, in Paradise Square (OX095), when it also took a 14 year lease on the Merton Street swimming pool (OX096) from the university and installed slipper baths. Oxford City Council was more active in provision of public baths after World War II, opening slipper baths and showers in Albert Street, Jericho (OX084) in 1952, Catherine Street, Cowley (OX085) in 1954 and in Lake Street, New Hinksey (OX019) in 1961. All the city's baths closed in the 1960s. Plans of the Jericho baths (Plate 6.4b) show that in addition to the baths and laundry facilities the building had a library. Hot taps for baths were operated from outside by the attendants (www.yourhouse-myhouse.org/jericho/jerdm.htm). Oxford's public baths are mapped in Figure 6.4.

Three baths were added to the British Workman public house in Headington (OX111) in *c* 1920 and the Temperance Hotel in Banbury (CH128) advertised 'Baths Hot & Cold' on


Public Baths
OX088
OX092
OX116
OX096
OX138
OX118
OX094
OX095
OX117
OX084
Jericho
Osney
Figure 6.4: Public Baths in Oxford
0
400
metres

its gable end (Plate 6.4c). A photograph of the sign above the baths in Buttermarket, Thame (SO142) is all that remains of the town's bathhouse (Clarke 1978, 145). However, the general level of provision in Oxfordshire's towns remained low.

There were other bathing facilities in 19th century Oxford, in the form of Turkish baths. In addition to those in St Clements (OX088), baths operated in Cornmarket Street (OX118), Hythe Bridge Street (OX114) and Merton Street (OX118), but none are recorded elsewhere in the county (Shifrin 2012). Turkish Baths became popular from the 18th century, after the experiences of travellers such as Lady Mary Wortley Montagu (Ashenburg 2007, 126).

The earliest known purpose-built swimming pool was a private, open-air pool at Emmanuel College, Cambridge (CA001), which may have been built as early as 1630 (Smith 2005, 11) and was, like most early pools, uncovered. The Serpentine Lake (LO013) in London was opened in 1730 by royal command to provide a communal bathing pool for males. From 1743 another, restricted to subscribers, was the Peerless Pool in Finsbury, London (LO014). There were large swimming pools at Ladywell, Birmingham (WM002) and Montelier, Bristol (BR001) before 1800, but most of the early pools were small. While Oxfordshire towns had exploited their rivers, coastal towns such as Bude, Penzance and Plymouth built pools which could be automatically filled by the tides (Smith 2005, 176).

Oxfordshire was fairly late introducing swimming pools, but its provision of public baths was even later. Some of the earliest recorded public facilities opened in Liverpool, where a privately-owned bath (ME007) was operating by 1794, when the local authority bought the land for dock improvements. In 1828 the corporation opened sea-water baths at St George's Pierhead (ME003) and four years later Kitty Wilkinson opened a laundry

(ME004) following an epidemic of cholera. Prompted by her example, the city's first Public Wash-house and Private Baths (ME005) were opened in 1842 and a second suite (ME006) four years later (Ashenburg 2007, 175).

Nowhere in Oxfordshire was there an example of the massive complexes of public baths, laundries and swimming pools which can still be found in other English towns and cities. Some are still in use, such as City Baths, Chester (CE001) (Gordon & Inglis 2009,100-1), but many others have been converted for other purposes, even a magistrate's court, Marylebone (LO015), or a temple, Manor Place Baths, Southwark (LO016) (ibid, 266-7).

6.6 Water supply in Oxford

Archaeological excavations within Oxford have demonstrated that wells formed the principal water supply from the early medieval period onwards, many just unlined holes in the gravel (Dodd 2003, 35-7; Bruce-Mitford 1939, 89-92). Several of the colleges had their own wells, one of which survives in the quadrangle of St Edmund Hall (OX049) (Plate 6.4d). A fine example of a hexagonal, 13th-century well house (OX011) lies in the mound of Oxford Castle (Plate 6.5a). The well itself is some 14 m deep and, when Daniel Harris investigated and recorded it in 1794, it contained human skeletons among other debris (Rhodes 1999, 73). Wells have also be found at Christ Church (OX060), Corpus Christi (OX058) and at the Old Ashmolean Museum (OX062; OX101).

There were piped water supplies to the principal monastic sites during the later medieval periods as discussed in Chapter 3, but these did not survive the Reformation. The Hospital of St John, now Magdalen College, was served by an aqueduct fed from a spring, Crowell (OX035), in Holywell (Durham 1991, 66). Prior to the establishment of the hospital the site was part of a Jewish area of the town and Durham located a possible

mikvah (OX057), ritual bath, when working at the college. The various holy wells in the town have been discussed elsewhere.

In 1610 Otto Nicholson proposed a scheme to improve the water supply to the city of Oxford and in 1615 the City Council granted permission. A Well House (VW020) was built above North Hinksey (Plate 6.5b) which collected stream water in a 2 000 gallon (c11 000 litre) tank, from which pipes ran to Carfax where an elaborate Conduit House (OX016) was built (Clarke 1997, 4) . The upper part of the Carfax Conduit supplied the University and the lower part the Town (Figure 6.5). Unfortunately within 50 years of its construction complaints began that the structure was impeding traffic. In 1787 it was replaced by another water house on the north side of Carfax (OX014) and the Conduit was given to Lord Harcourt in 1789. He re-erected it in Nuneham Courtney Park where it still stands (SO025) (Plate 6.5c). The water system in the City passed from University to City control in 1869, by which time the flow of water was low (VCH Oxon IV 1979, 354-5). The North Hinksey Conduit House is still in place and continued to supply water locally until 1944 (Crawley 1947, 93). Pipes thought to have been part of the system have been excavated in High Street (OX067) and at Lincoln College (OX068) (Oxford city UAD).

The Carfax Conduit (OX016) is only one of the supply features shown on Loggan's Map of Oxford, 1657. This unusually detailed map (Figure 6.6) also shows the Holywell east of St Cross Church (OX10), street taps or pumps in Cornmarket (OX076), Magdalen Street (OX077), Queen Street (OX017), then called Butcher's Row, St Aldate's (OX074), Broad Street (OX072) and St Giles (OX078). A shaduf (OX073) stands on the riverbank, so this technology was obviously still used into at least the 18th century with one included in a Malchair drawing of 1783 (Bodleian Library Ashmolean Drawings by Malchair vol3 f.23).

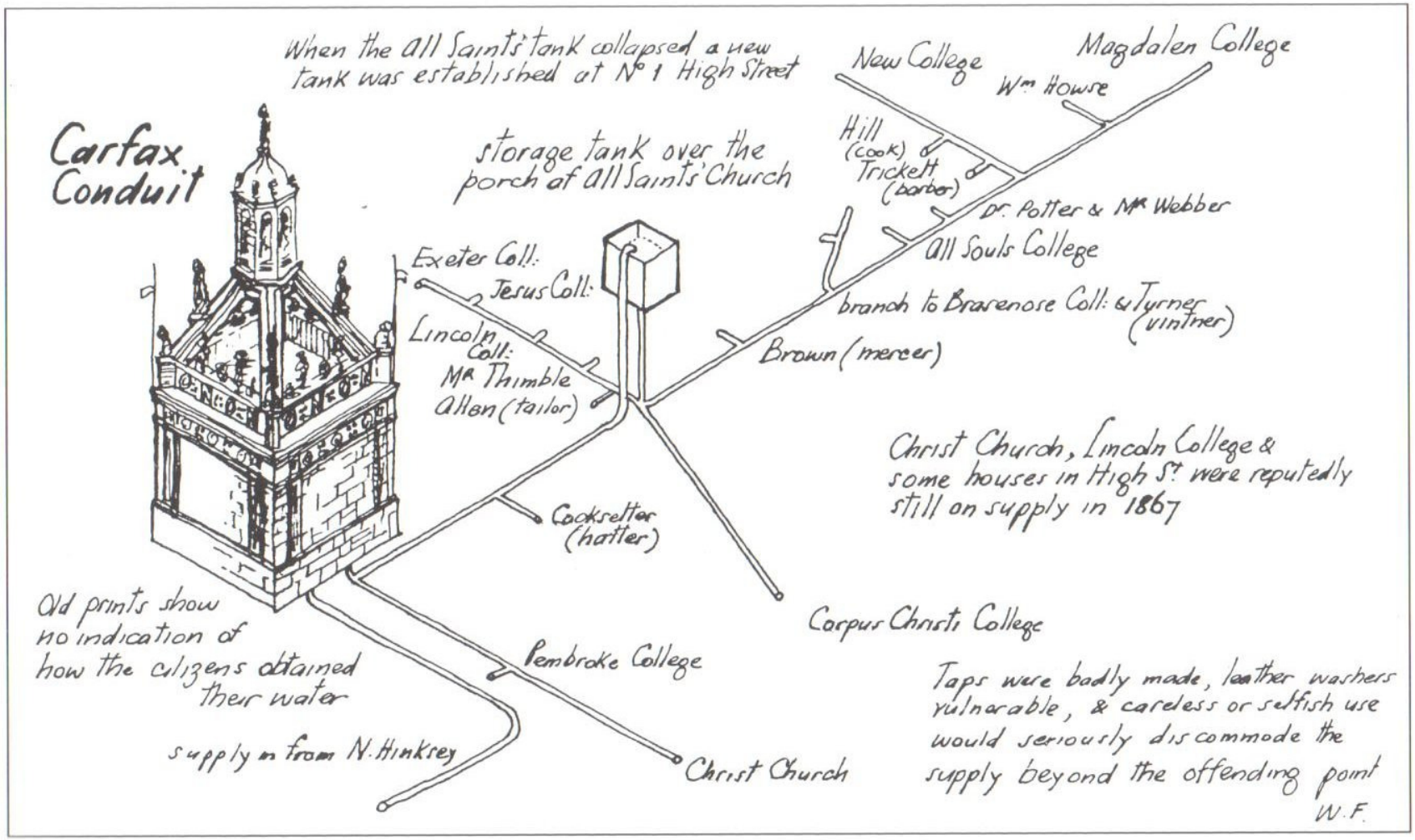


Figure 6.5: Distribution Map for Carfax Conduit (from Barty-King 1992)

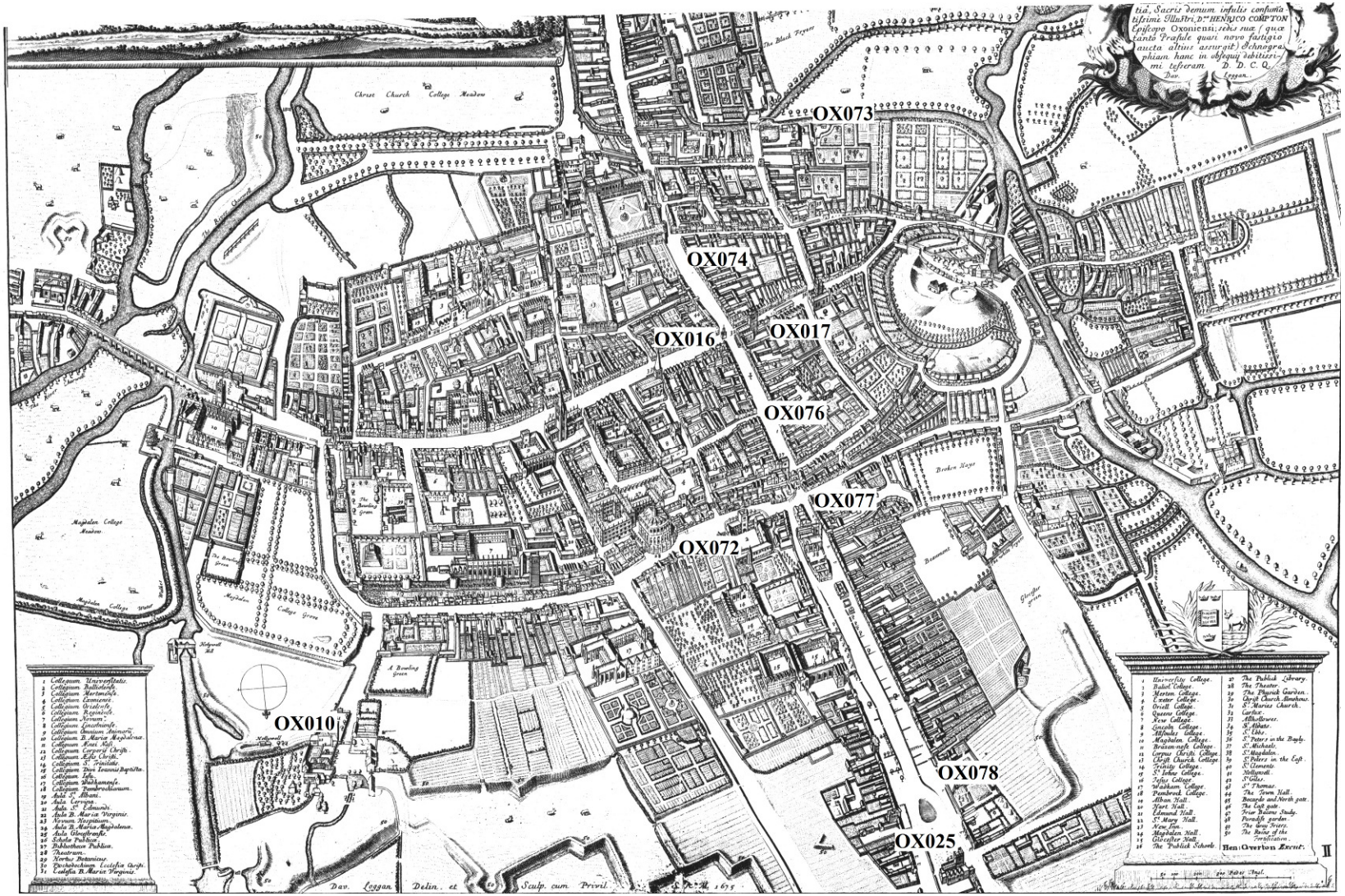


Figure 6.6: Loggan's Map of Oxford, 1675

A new city waterworks was constructed in 1694 at Folly Bridge (OX035) from which wooden pipes carried water around the city. One pipe led to a cistern (OX119) in Cornmarket intended for fire-fighting. To improve the flow of water to the wheel in the waterworks and its force pumps, dams and floodgates were constructed on the various streams in the St Ebbe's area. Improvements to the machinery were made in 1767 and again in 1825 when the waterworks moved to the end of Isis Street (OX022). Unfortunately, too few people were prepared to subscribe to these water supplies and they were not a financial success (Crawley 1947, 94).

Most people continued to use river water and shallow wells. Oxford Prison was among those who took water from the river, with prisoners operating a treadmill to fill a storage tank (OX089) in one of the towers. The tank features on the current prison tour, along with plans of the treadmill of which only parts of the shaft survive. Using prisoners in this way was a standard practice in the Victorian period (Emsley et al 2012).

Following the severe outbreaks of cholera discussed above, a new water supply for the city was eventually established. A new waterworks on land at Wolvercote was proposed, but it was built at New Hinksey (OX019) in 1853. A hole suitable for a reservoir had been created when ballast was dug during construction of the railway, which runs alongside it. The water supply was a combination of local springs and Thames river water via the Hog Acre Ditch which left the river at Ferry Hinksey (Crawley 1947, 95). A pumping station built by the side of the lake is now a Community Centre (Plate 6.5d). The building was designed by James Jones who became the first manager. Like most Victorian public buildings its architecture was impressive, with an essentially classical design. The sewage pumping station at Littlemore (OX087), built in 1879, but not surviving, was in an Elizabethan style by Hawksley and White (Woolley 2010, 77).

Capacity soon proved inadequate and in 1862 new pumps were installed and the reservoir (OX004) on Headington Hill, still used by Thames Water, was constructed in 1878. An Act of Parliament passed in 1875 granted Oxford Corporation the right to acquire the land and supply the parliamentary borough of Oxford and the parishes of St Aldate's, South Hinksey, Cowley, Headington, Iffley, Littlemore and Wolvercote (Hibbert 1988, 494). Additional engine houses were added in 1884 and 1890 (ibid, 77).

The uptake of the Corporation water supply had been very slow since the Folly Bridge Works were opened in 1694 and the city had had to compel all its tenants to connect in 1776. The number of subscribers grew slowly: less than 10% of those eligible in 1849, almost 50% by 1866 and 100% by 1884 (Hibbert 1988, 494). Costs were based on rentals with additional charges for water closets. In 1874 these were 6d in the £ for water, 1/6 minimum and 10/- maximum for one WC, 2/6 each additional fixture (Waterworks Committee Minutes HH3/1).

Some free public sources of water were available in the 19th century. A well from that period was discovered under the pavement outside the Lamb and Flag in St Giles (OX009) which had probably had a pump fitted (Oxford Mail, 15/12/1951). Who paid for it is unknown, but the pump outside St Mary's Church in High Street (OX002) (Plate 6.6a) was obviously the parish pump (Joan Bates 1/1/1975). Provision of a gratuitous public water supply was made a parish obligation by the Public Health Act 1875 (Hassan 1998, 18).

6.1.1 Complaints about the water supply did not end with the opening of the Hinksey Works. The Medical Officer's Annual Reports to the Oxford Local Board of Health, held in Oxfordshire Archive (DC101/A/1), stressed throughout the 1870s

the need for water to be filtered, and recorded high ammonia levels, although it was felt that typhoid outbreaks in 1881 and 1884 were not attributable to the water.

An 1885 Act added Marston and North Hinksey to the Oxford water supply area and, in permitting construction of an intake at King's Weir, reaffirmed the city's 'right by the user or venturee to draw from the River Thames an unlimited supply of water' (Fasnacht 1954, 198). The new filtered source was regarded as a great improvement on Hog Acre Ditch which was cut off in 1887. However, the following year there were problems when floods made the water too turbid for use (Medical Officer's Report 1888 DC101/A/1).

Although the reservoir (OX004) had been in Headington since 1878, that part of the city was not connected to the supply until 1903, which necessitated construction of the Brasenose service reservoir (SO097) at Shotover. In the 1920s the water supply was again becoming inadequate so work began on a new plant at Swinford (VW037) and a new reservoir at nearby Beacon Hill (VW048). Additional storage capacity was added at Headington and the new Horspath Reservoir (SO098) while the Hinksey works (OX019) finally closed in 1934. The area supplied from Oxford continued to expand and several additional service reservoirs were built, on Boars Hill (VW060) and at Noke (CH115) for example. In addition there was a water tower filled from a small reservoir (VW108) at North Hinksey (Crawley 1947, 98-102). The Swinford facility continued to supply the city until Farmoor Reservoir (VW038) was built in the 1960s.

During World War II emergency measures to protect water supply were put into place, including the construction of water tanks at intervals of *c* 1 mile along main routes (Crawley 1947, 104) (Figure 6.7). The remains of some of these have been recorded during building work at colleges (OX050-56; OX062; OX064).

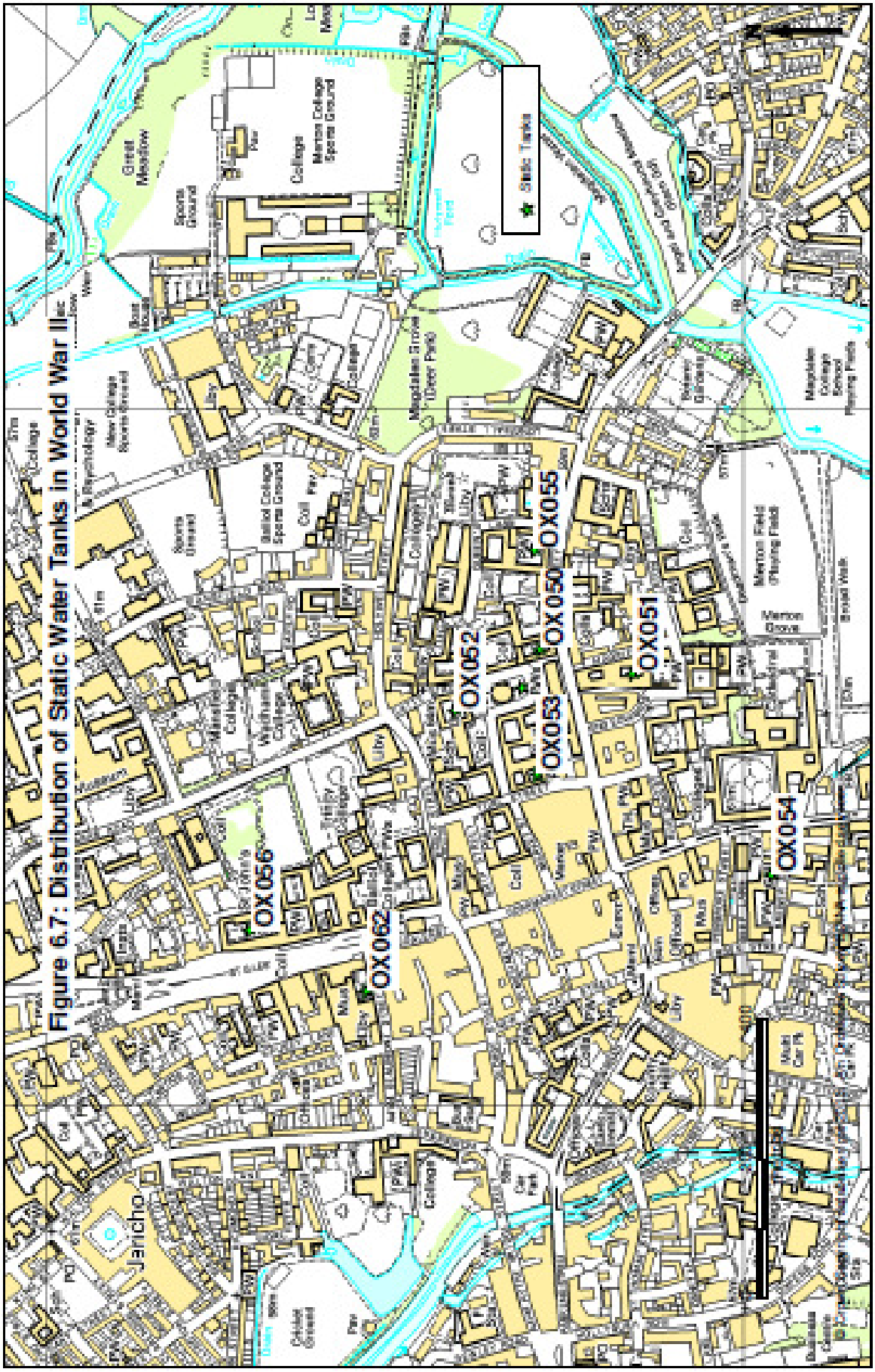


Figure 6.7: Distribution of Static Water Tanks in World War II

Within the city more localised provision of water was made in the 19th century. On the wall of St Mary's Church in the High Street the parish pump (OX002) is still standing and in Rosehill Cemetery, mourners can turn to one of the lion head pumps (OX080) manufactured by Glenfield and Kennedy (Plate 6.6b). The city's drinking fountains have fared less well. Of four noted by Malcolm Graham only one survives, although not in its original location and not in working order (Graham 1991). The fountain on the Botley Road, outside the former council depot, was moved there in 1884-6 from a site south west of Magdalen Bridge (OX083). There was a fountain in Littlegate Street (OX114), one at the north west corner of the Covered Market in Market Street (OX113) and one inside the public library (OX112), part of the town hall, demolished in 1893. Survivals include a slightly more recent fountain attached to Carfax Tower (OX001) (Plate 6.6c) and the Victoria Fountain at St Clement's (OX005) (see Chapter 7).

While there are few ornamental public fountains in Oxford, some fine examples can be seen at the former Radcliffe Infirmary on the Woodstock Road, where there is a figure of Neptune (OX021), and in the University's Botanic Gardens (OX006) (Plate 6.6d). The statue of Mercury at Christ Church dates from 1935, but there was a fountain (OX020) in place by 1657, when Loggan drew his map.

Latrines or "necessary houses" have been identified at New College (OX061) and Magdalen College (OX047) (Listing descriptions). The Long Room at the former originated in the 14th century, its cesspit replaced by earth closets in the 19th century and WCs installed in 1903. Magdalen College's facility is much newer, built in 1763. Neither is still in use. The city's first public toilets, an underground facility for men (OX097) opened in 1895 under St Giles (Jackson's Oxford Journal 12th October 1895) and, with much controversy, in 1909 a similar one for women (OX098) was opened in Magdalen Street East (St Giles website); both are still in existence.

Although of modest size, Oxford, like most major towns, had some form of public water supply from the early 17th century onwards. Its development was hampered by low uptake by paying customers, but epidemics of disease and the growth of civic responsibility led to improvements to infrastructure which still form part of the modern mains network.

6.7 Thame – evidence from a small town

Thame is typical in size of the market towns of Oxfordshire. Its known water features are mapped on Figure 6.8. From 1066 it was held by the Bishop of Lincoln, who maintained a prebendal house there during the medieval period, and the town gained much of its status from this connection. The layout of the historic town resulted from the bishop's decision to reroute the road leading to Buckinghamshire, forcing travellers to pass through his new market, established in 1230. Thame Park, to the south-east, was the site of a Cistercian monastery from the mid 12th century until the reformation in the mid 16th century (VCH Oxon VII 1962). It then became a private house and has been considerably altered and given formal gardens, in which a pond and fountain form the centrepiece of the entrance drive (SO043).

The town had its holy wells, Cottmore Well (SO081) to the east of the town and Court Well (SO082) near to the centre (Lupton 1860, 7). The latter allegedly cured eye complaints and the spring continued to run, although well hidden in the hedge, until 1975. St Joseph's RC Primary School was built on its north side. Only the stone surround has survived (Jay 2006).

It would have been easy to sink a well as the town lies on sand and gravel close to the

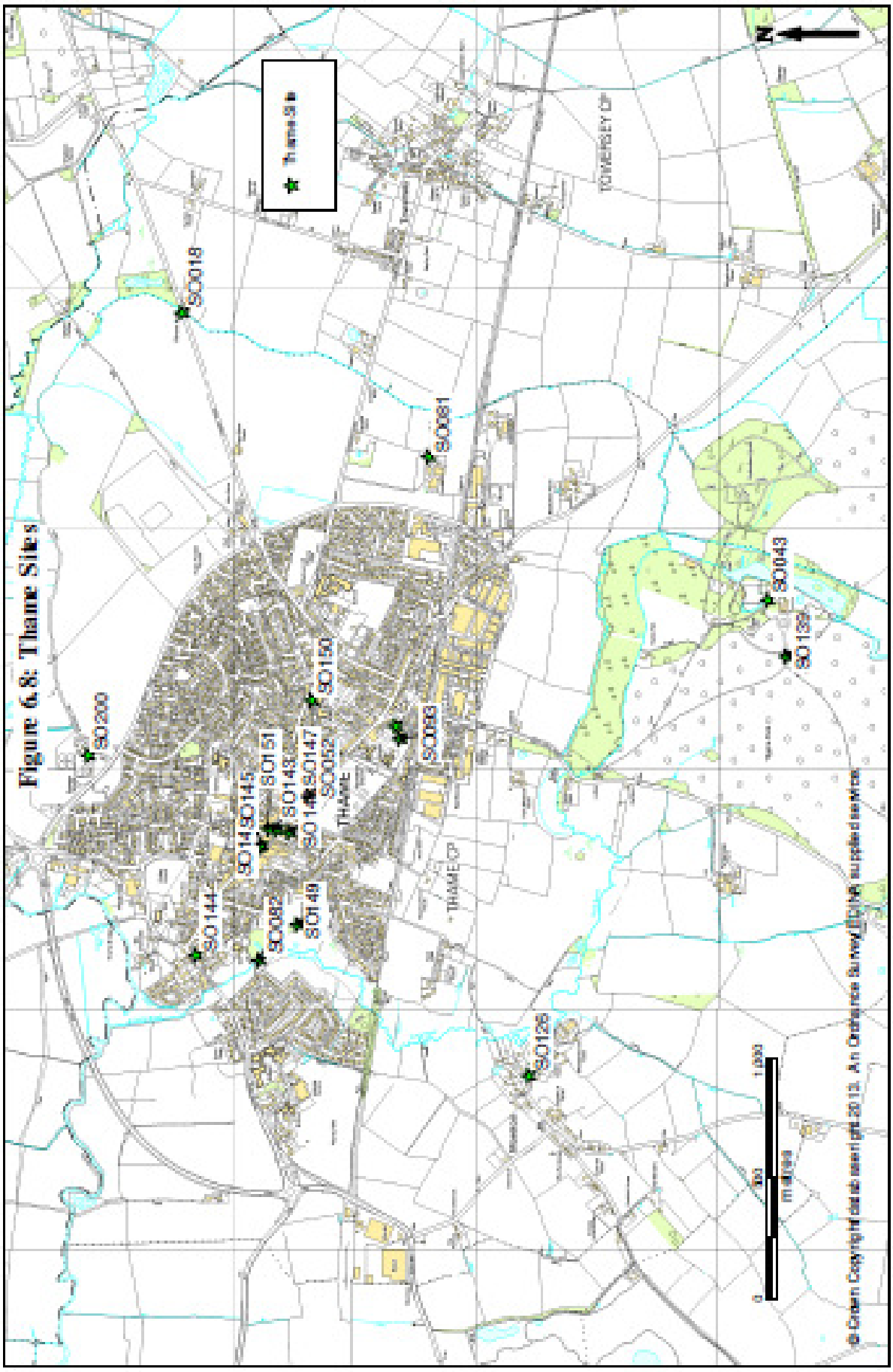


Figure 6.8: Thame Sites

River Thame where the water table lies at a relatively shallow depth of 3 - 10m. However, the reputation of the water was very low, as noted by Plot in the 17th century (Plot 26-7, 1972). Few of the wells and pumps have survived, although their locations are occasionally discovered by accident, including the former site of the common pump (SO145) in the centre of the town (Paul Smith, County Archaeologist, *pers. comm.* 1998*).* Those entitled to use it kept their own pump handles (Brown & Guest 1935, 248). A well survives in the garden of 2 Priest End (SO144), a 17th-century house on Oxford Road, as does a pump dated 1751 in the courtyard of 42, Upper High Street (SO146), another 17th-century house (Plate 6.7a). The Ordnance Survey maps from the 1880s onwards show a proliferation of wells and pumps across the town, some in open public areas such as the recreation ground on the south side (SO149) and another near the gas works on Wellington Street in the east (SO150). These were not removed until at least the 1920s.

The drainage in Thame was in poor condition by the later 19th century, mainly consisting of open gutters emptying into ditches, and coupled with the leaky privies this was not helping the water quality. In 1871 the Local Board of Health ordered that gutters be cleaned, wells deepened and pumps erected (Brown & Guest 1935, 230-1). This had limited success and the 1893 Rivers Pollution Prevention Act brought the threat of substantial fines for emptying sewage into the River Thame. Land was purchased for a sewage farm (SO200) and in 1900 most houses were connected to a pumped sewage system, at a total cost of £7,271. Unfortunately, the only water available to flush the sewers apart from rain water was inadequate and the Town Council had to investigate a new supply. A borehole into the greensand was proposed and after some unsuccessful attempts a site was selected just outside Thame in the parish of Towersey (SO018). The water was pumped into the town to a 60,000 gallon (300,000 l) tank on a 20 m tower (SO093), a store of one day's supply. The waterworks (Plate 6.7b), again costing

c £7,000, opened in 1905. Public pumps were gradually removed to encourage residents to connect to the mains (ibid, 247-50). The waterworks ceased operating *c* 1960 and the water tank was demolished. The pumping station itself survives, and is now a private house (SO018).

At some point a bath house (SO142) was opened in Buttermarket, operating on Tuesday (market day), Friday and Saturday at a cost of 6d (Clarke 1978, 145), but no further detail has been found.

Reluctant to surrender the wealth of their parish church to sequestration by Henry VIII and his reformers, the town authorities converted at least part of the treasure into money, which was used to support public works, such as creation of a new road leading east from the town. As a result of gravel extraction a new pond, White Hound Pond (SO052), was created on the south side of what is now Upper High Street (Bretherton 2010). The pond was handily placed for the cattle market when it was held in that unusually wide street. During the 19th century water from the pond also supplied the town fire engine, which was housed on the opposite side of the street. Supply was improved in 1880 when an underground drain connected the pond to a storage tank (SO151) at the corner of Upper High Street and North Street (Boyd 2008, 74).

By this time a pump (SO147), which appears on the 1890s OS map and was later replaced by a drinking trough (SO148), had been erected. Both trough and pond were replaced in the 1920s when the area was redesigned to form the War Memorial and Pearce Memorial Gardens, which incorporate a rectangular ornamental pond with fountains, one of which is a statue of a boy holding a fish (SO052) (Plate 6.7c). The original statue was erected in 1926 by Ernest Pearce of Australia as a monument to the memory of his parents Philip Henry Pearce, a woolstapler, and his wife Elizabeth

(http://www.thame.net/history.asp). The bronze fountain statue was stolen in September 1985 and never recovered. In the summer of 1992, a replica was commissioned by the Town Council. This too was stolen, but several years later spotted in a London shop and recovered. The drinking trough (SO148), funded by the Drinking Fountain Association, survives, now in a garden elsewhere in the town (Boyd 2008, 91).

There is an unusual surviving well (SO143) in the basement of Thame's Market House (Plate 6.7d), an isolated building at the west end of Upper High Street, which was used as a livestock market until 1951. Despite its location it only became the market house in the 1800s. The building, probably 17th century in origin, was originally a smithy, then an ale house and from 1786 to 1853 a chapel for various denominations. In the south wall of the basement a opening gives access to a rectangular area outside the building within which is a stone lined well, 90 cm in diameter. It is now blocked with debris, but according to the 1829 sale particulars it had 'excellent water'. (Davison 2011, 44-6). How the well was accessed and whether from the outside at ground level as well as from the building's basement is unknown.

The development of Thame's water supply over time probably represents a fairly typical picture of the pattern in small towns. In general provision was left to individual property owners and occupiers until the second half of the 19th century when legislation shifted responsibility to the public sector.

6.8 Industry and bulk users

While this study is not concerned with the supply of water as a source of power, it is impossible to ignore commercial and industrial uses of water completely, if only because of the potential for competition for limited resources. Other factors of concern for those

who needed to obtain large quantities of water on a regular basis were cost and quality.

Production of printed books began in Oxford in 1478, but until 1678 there was no centralised printing facility. In that year the Oxford University Press was established in the basement of the Sheldonian Theatre, where it remained until 1713. The Press then moved into a new building, the Clarendon Building, which proved poorly suited to its purpose. An expansion in demand for books prompted the construction on a new site in Walton Street into which the Oxford University Press moved in 1830 (Sutcliffe1978, 4).

This building had been carefully planned, including provision of adequate water supply for the new steam printing machines. The works would obviously use large quantities of water and, with both cost and reliability in mind, the University intended to obtain its own supply from a well. The minute books of the Press recorded on 28th July 1826 that the well in the specification had failed to yield adequate supply and that a deeper borehole was to be sunk (OUP archives). The cost allowed for subsequent drilling and finishing of the well was £30. This exercise must also have been unsuccessful as the record for October 26th 1832 includes the terms on which the City Water Works Committee was prepared to supply river water. The Committee said that 'the outlay would necessarily be very considerable and somewhat inconvenient' and demanded a lump sum of £100 with an annual fee of eighteen guineas to supply water through iron pipes to the tank (OX028), then under construction (*ibid.*).

Building works continued at the Press in the 1830s and included two Superintendents' houses, offices, an engine house and privies. Within the houses there were to be water closets, but apparently only on the ground floor. The copy of the specifications preserved in the Press archives makes it clear that good drains were to be constructed and connected

to cesspools at least seven feet deep and five feet wide. Each house was to have a two hundred gallon (1000 l) cistern installed and all were to be supplied from the main works cistern (OX028) (OUP archives).

In the centre of the quadrangle a circular pond was constructed and is still *in situ* (Plate 6.8a). Although it has a central fountain and looks very much a typical ornamental feature, this structure is a reservoir with *c* 12 m depth of water, the supply for the press buildings and the presses themselves. 19th-century photographs show a woman and child seated on the edge, rather in contrast to the lifebelt and deep water warning signs now in place. Despite this, current employees of the Press seem unaware of this depth (Weiner & Maw pers. comm. 12/08/08).

The integration of the works water supply into a landscape feature is typical of its period. Until relatively recently access to the garden to experience this landscaping was restricted to the higher levels of management of the Press, the Superintendants and their families. The ordinary worker was at least provided with adequate privies.

The Oxford University Press was at one time the largest employer in Oxford and the suburb of Jericho developed in large part to house its workforce. The demands of the Press also had a great influence on the corn mills around Oxford, many of which were converted for paper production. The main paper mill supplying the OUP was at Wolvercote.

The water mills across the county were used as sources of power, but there are examples of their conversion to supply river water for domestic consumption. In 1922 a turbine was fitted to one side of Mapledurham Mill (SO111), which supplied water to the whole estate and generated electricity. This continued until *c* 1960 (Williams 1980, 21). The

mill had been operating a water pump into a reservoir since the 1870s.

For brewing beer it would be undesirable to use water contaminated with sewage or other waste and even modern purification leaves chemical residues which may be detectable to the drinker. It is still common practice for breweries to have their own boreholes or wells (see Chapter 5). The brewery in St Thomas Street, Oxford had its own wells, although the steam machinery used water from the River Thames extracted using a horse wheel (Major 1980, 30). The wheel has gone, but the well site is still visible (OX124).

It was common for large department stores to install their own water supplies for a variety of purposes. There is no available evidence as to whether Cape's or Ellison & Clavell, the Oxford department stores, had any such installations, although evidence from elsewhere in the country would suggest it likely. Excavations in Cambridge in 2005-6 uncovered a number of wells (CA002), one of which was a very deep steam powered example which had supplied a brewery attached to Robert Sayles' department store (Dickens & Cessford 2007, 31). The store also had accommodation for live-in staff. Harrods (LO017) has its own water supply from 3 wells, one of which is nearly 170m deep, with the water stored in a roof top tank concealed by its baroque dome (http://www.streetsensation.co.uk/sights/harrods.htm).

Large communities such as hospitals or military bases also need to have an assured water supply, which usually consists of a water tower (Barton 2003, 140). Examples can be seen at Shiplake College (SO053) and at the Centre for Hydrology and Ecology at Howberry (SO085). Similarly the UK Atomic Energy Authority at Harwell, established after World War II, had its own waterworks (VW087) with chlorination plant, storage tanks and pumping station at Sutton Courtenay. After Harwell was connected to the mains in 1993 the plant was allowed to stand derelict until 2002 when it was demolished

(The Oxford Times 2002). The former RAF bases of Bicester (CH105), now converted to a gliding centre (http://www.blhs.org.uk/index.php?page=raf-bicester), and Upper Heyford, scheduled for residential development (BBC News 26.03/2011), still retain their water towers, although their futures are uncertain. Upper Heyford in fact has three towers (CH114; CH 232; CH233) (Plate 6.8b). The water tower built for a World War II US base in Cornbury Forest (Oxford Archaeology 2005,10) still exists (WO090) (Plate 6.8c), as does that of RAF Mount Farm (SO084), now lying within the new village of Berinsfield. Towers were built for two hospitals in South Oxfordshire in the late 19th century. Peppard Hospital has been demolished for housing (Family tree Forum 2013) and the site has lost its water tower (SO167). The main buildings at Fairfield Hospital, Milford, which incorporated a water tower (SO044) are to be retained within a new residential development, but its newer steel water tower (SO164) (Plate 6.8d) is likely to be demolished (http://www.cholseycdt.org.uk/fairmile/area-profile-and-local-history). St Mary's Convent in Wantage (VW043) together with its water tower has been demolished and the site redeveloped.

While aeroplanes were not the forms of transport requiring large amounts of water, road users in the late 19th and early 20th century suffered from dust and roadside pumps were used to damp it down, while also supplying a useful watering point for steam powered vehicles such as traction engines. No survivors have been recorded in Oxfordshire, but there is a Grade II Listed example (BE005) on the A4 just west of Reading (Berkshire County Council 1995, 240). Road construction still uses large amounts of water in the concrete and abstraction for this purpose is thought to have been a cause of falling water tables in the later 20th century, although careful monitoring of the shallow wells at Blewbury failed to show any relationship (visit to Blewbury Historical Society 2000).

During the age of steam, water tanks were common at railway stations. Very few remain,

but there are two examples at the Great Western Railway Centre at Didcot (SO162; SO195), the larger of which (Plate 6.9a) is combined with a coal fuelling point (http://www.didcotrailwaycentre.org.uk/). The canal network also required large quantities of water to be kept in reserve to maintain water levels. The canal reservoirs take the form of large lakes, generally indistinguishable from those for potable water. The Oxford Canal runs parallel to the River Cherwell for most of its length and can obtain water from it, but in north Oxfordshire a reservoir (CH004) was constructed at Clattercote in 1777 (Plate 6.9b). It was created by enlargement of the great fish pond, formerly known as the Leper's Pool at what had been Clattercote Priory during the medieval period. Its present area of 8.5 ha dates from 1787, and it is surrounded by timber walkways creating a popular fishing venue (Compton 1976, 25). Canals can also pose a threat to domestic supplies by competing for resources and during a severe drought in 2010 almost half of the Leeds and Liverpool Canal was closed (Beament 13/07/2010). Given the water situation in England in early 2012 it is likely that competition will increase.

6.9 Summary

There has been a far greater change in how water has been supplied to towns since the mid 16th century than in rural areas. Although Oxfordshire has few large towns, the county has nonetheless a good range of examples.

These changes have demonstrated advances in technology, most significantly the advent of steam-power for pumping stations. The high population densities in urban areas have also put pressure on drainage and waste disposal systems, which were not fully addressed until at least the late 19th century. Key incentives for these improvements were serious outbreaks of disease such as cholera, where a direct connection between contaminated

drinking water was demonstrated. Oxford was one of the few cities where these outbreaks were analysed in any detail, by Sir Henry Acland and others.

Urban water supplies illustrate how municipal authorities gradually assumed full responsibility for water and sewage, which until the early 20th century had owed much to private companies and individuals, such as Otto Nicholson of the Carfax Conduit.

7 ISSUES AND ATTITUDES TO WATER SUPPLY

7.1 Attitudes and Initiatives

The framework of legislation described in Chapter 2 clearly provides scope for water features to be designated. There are in addition various systems of recording to indicate their presence within an area of proposed development. Mechanisms for protecting monuments, albeit not perfect, are in place, but the first step is for water features to be identified and entered into the appropriate list. This requires someone, usually at local level, to raise awareness and initiate the process.

Even when a historic feature has been recorded on the SMR or NMR, or even designated as an SM or Listed Building its preservation is not guaranteed. The NPPF has a '*presumption in favour of sustainable development'* and proposals should be implemented *'unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefit*s' (DCLG 2012, 4). During the planning process the decision to allow a development to proceed may mean that not all structures or sites will survive. At least if the feature is on record an informed decision about its future should result. What is less easy to ensure is a level of care and maintenance which will prevent deterioration of a feature and help avoid vandalism or accidental damage. When the Heritage at Risk lists were published in 2008 (EH 2008) a significant number of sites associated with water supply, although none within Oxfordshire, were featured mostly under threat from simple neglect rather than any proposed development. By 2012 (EH 2012) the list included one Oxfordshire water feature, the Grade II well-house at Wick Farm (SO042), discussed in Section 7.1.3.

It seems clear that the key aspect in the preservation of evidence of historic water supply is for some person or group to care enough about a site to assume responsibility for it. To

illustrate this in more detail a series of case studies is presented below. Three sites involve Listed Buildings, one is a site recorded on the Oxfordshire SMR and the other two sites identified only through local knowledge.

7.1.1 Maharajah's Well, Stoke Row

The well at Stoke Row (SO010) (Plate 7.1a), paid for by the Maharajah of Benares, has been described in Chapter 5. When it was sunk in 1863, the gift of the well was accompanied by enough land for a cherry orchard and a cottage for the Well Keeper (Plate 7.1b), with Trustees in overall charge. The intention was for the sale of fruit to provide enough money to fund the upkeep of the well and cottage, so that the villagers would be able to have free water in perpetuity (Williamson 1983, 5). The Well Keeper was provided with accommodation in return for ensuring that the well was not misused and later maintained a stock of guidebooks for sale to visitors. The benefaction was registered as a Charitable Trust with the Charity Commissioners. The Maharajah's local connection, Edward Reade, was a Trustee and later the churchwardens, augmented after 1917 by representatives of the Parish and District Council. In 1983 the Parish council became the sole Trustee (ibid, 12).

According to the guidebook, Edward Reade added a clause to the agreement preventing further approaches to the Indian benefactors if funds ran short. However, more recently contacts have been restored. When major restoration work has been required, which could not be met from fruit and book sales, major local fund-raising exercises have filled the gap, particularly during the 1980s. The position of Well Keeper passed down through one family from 1878 to 1972 (Williamson 1983, 7).

As it did not seem likely that the orchard would still provide an adequate source of income in the 21st century or that selling a few guide books would merit the use of the

cottage and it also seemed possible that this site might be a suitable candidate for one of the management agreements envisaged in the draft Heritage Protection Bill (DCMS 2007, 24), contact was made with the Trustees.

The arrangements for upkeep of the well and cottage have been revised in recent years. In 2000 the last Well Keeper retired and the cottage is now let out on a commercial basis, the income from rent, sales of books and donations intended to offset maintenance costs. The Secretary to the Trustees kindly supplied copies of accounts for 2006 and 2007, plus a summary of typical expenditure (Claire Dunk, Ipsden Parish council 2008).

Annual running costs are in the order of £3,100. The well is repainted every 10 years and the most recent cost for this was £21,000. The cottage will also need periodic refurbishment.

	2006	**2007**
Income - rental	5370.00	8460.00
Income – sales and other	2387.87	2392.16
Total income	**7757.87**	**10852.16**
Expenditure - refurbishment	6889.12	3336.66
Expenditure – regular		4974.38
Total expenditure	**11615.75**	**8311.04**
Income-expenditure balance	-3857.88	2541.12
Bank balance	20,714.28	22807.62

Table 7.1: Accounts for Maharajah's Well, 2006-7

As the summary of the accounts for the two years shows, the annual income is easily sufficient to cover yearly running costs, with a substantial surplus that should provide enough to pay for periodic refurbishment work.

The Trustees of the Maharajah's Well appear to have taken appropriate steps to ensure that it remains self-financing as had been intended by the original benefactor. Although

there is no need to use the well to supply the village with water, the structure remains in good condition and is an asset to the character and income of the village. In an emergency the supply might be reinstated without too much difficulty.

Unfortunately, the option of the new Management Agreements was not followed up as the trustees were unaware of possible changes to Heritage Protection, much less any detail of the proposals, which have not been implemented. Both well and cottage are Grade II Listed and consents are sought as required - replacement windows for the cottage for example. The Trustees have not experienced any difficulties in this respect (Claire Dunk, Ipsden Parish Council 2008).

7.1.2 Victoria Memorial Fountain, St Clement's, Oxford

The Victoria Fountain (OX005) (Plate 7.1c) was erected in 1899 and supplied water for people and horses until around WWII. The Grade II Listed Building is now located on a traffic island between the carriageways on the Magdalen Bridge side of the roundabout at The Plain. A local resident and trader led unsuccessful campaigns for its restoration in 1989 and 2003 (Oxford Mail 30/7/2003). In 2007 the proposal was raised again, this time as part of wider plans to improve the impact of the St Clement's area as a gateway to Oxford. As well as the Plain Traders Association, lead by Erica Steinhauer, the proposals were supported by the East Area Committee (Oxford Mail 26/4/2007). The wider plans were also supported by the Oxford Preservation Trust and Magdalen College. In 2008 the Oxford Mail carried an article announcing that restoration would be recommended to the City Council, but not reinstatement of the water supply, based on opinions from Council specialists, English Heritage and Thames Water (Bardsley 2008).

A number of arguments against the proposal for a water supply were cited:

- Danger to users from crossing the busy roads around the fountain;

- Damage to the structure during installation of pipework;
- Inability of Thames Water to guarantee purity of supply.

The first point has some merit.

In order to find out more about the project and the thinking behind the recommendations many of those known to be involved were approached. Not all replied. Unfortunately no contact details could be obtained for the relevant person at Thames Water. Questions raised include reasons behind the restoration, who would be responsible for maintenance, how the work would have damaged the features and the desirability of providing drinking fountains generally.

Gaelle Jolly (pers comm. 11/8/2008) said that the Oxford Preservation Trust had not given any thought to the provision of drinking fountains and had had no strong views on the St Clements case itself. She felt that it would be difficult to get people into the habit of using drinking fountains and having trust in their safety. The feature is in City Council ownership, and she could only assume that they would have to be responsible for upkeep

Councillor Young had felt that restoring the water to the fountain would have enhanced it as a historic feature. She does have concerns about the traffic problems in that area, but felt that there is a need for more working drinking fountains, and locations in East Oxford were being investigated (pers comm 14/9/2008).

Kathryn Davies of English Heritage talked about the extent to which the structure would have needed to be dismantled for pipework to be installed. She offered assurances that English Heritage was not opposed to restoration projects of that type generally, but that every case was considered on its individual merits. EH will consider the evidence for its

historic function, the state of society and its fitness for the site. In the case of St Clements, the location and traffic problems suggested that the amount of disruption to the fabric was not justifiable. Once restored, the lack of running water would not represent a significant detraction from its value (pers comm. 13/9/2008).

No respondent had felt that restoration to a working feature would affect potential vandalism. There was a general lack of awareness that in the UK communal water features are not used as they are on the Continent or that this situation might merit consideration, although the St Clements case did raise some possibilities in East Oxford.

The willingness of English Heritage and Thames Water to consider reconnection of water features where appropriate has been demonstrated in North Aston (CH016). The Victorian drinking fountain was restored as part of the village's millennium celebrations and does deliver water. The attached plaque, seen during a site visit, lists the above organisations among the sponsors of the project. Other millennium projects, identified during site visits, involving the erection of pumps, were identified in Little Milton (SO050) and Reading (BE007). The pump in the former is set among flower beds surrounded by boards listing parishioners, but doesn't work. As the Reading pump lies in the centre of a roundabout at a busy junction, a live active water supply would have been wasted. Why pumps were chosen is questionable in both cases.

7.1.3 Well House, Wick Farm, Barton

The 18th-century well house (SO042) at Wick Farm (Plate 7.1d) is a Grade II Listed Building, and the only one of Oxfordshire's designated water features to appear on EH's At Risk List (EH 2012). As part of the process of arriving at a plan for the conservation of the monument Oxford City Council, English Heritage and the then landowner in 2012 consulted buildings specialist Julian Munby of Oxford Archaeology. He identified the

possible links with the Walter family and Sarsden House discussed in Chapter 4. A Historic Buildings Study had been commissioned in 2011 (Robison 2011), which included measured survey.

The future of Wick Farm and its surrounding area is currently uncertain. The farmhouse has been sold separately and the farm with the well-house changed owner in the second half of 2012 (John D Wood Estate Agents 2012). Planning considerations for the site include the future of the well house and possible provision for limited public access. The area to the south falls under the Barton Area Action Plan (Oxford City Council 2012) and there are proposals for an extensive housing development. Although this would not affect the well house directly, the monument would attract more attention and lie on pedestrian routes into the countryside. This represents an opportunity for restoration of a significant water feature where the relevant local government and heritage bodies are actively involved in the process.

7.1.4 Woodcote Ponds

The village of Woodcote lies on the chalk hills of South Oxfordshire. To its south-east, at Greenmoor, are two ponds (SO 127), labelled on an undated post-medieval map as 'sheepwash ponds', which is how they are recorded on the HER. The ponds (Plate 7.2a) and their surroundings are rich in wildlife and negotiations are under way to designate the area as a Local Nature Reserve. The water level of the lower pond, which supplied the village with water into the 1920s, had been dropping since the beginning of the 21st century and in 2004 the Greenmoor Conservation Group, supported by the Parish Council, began investigations into the cause (Woolley 2005).

Two explanations seemed possible – a blockage in the line of the springs which fed the pond or a hole in the lining of the pond. A water diviner was called in to look for the

spring lines in 2006 and, knowing of the author's interest in wells, she made contact and a visit to Greenmoor on 21st June 2006, was arranged.

At the west end of the pond is a capped, brick-built well (SO129) (Plate 7.2b). Close by are concrete steps leading down into the pond. The author was able to supply photographs of similar structures and information about well restoration elsewhere, which might provide useful. Any restoration of the well will have to wait until the problems with water supply have been resolved because the wildlife is regarded as most important. By mid 2007 the cause of the drop had been identified as diversion of the aquifer and after remedial excavations were carried out water was flowing again and the pond level rising (Wooley 2007).

The village of Woodcote values its heritage and, although the ponds are primarily regarded as a wildlife site, the various local groups are also keen to investigate their history. Mark Bowden of English Heritage suspects that the ponds may have been important to a probable Romano-British site, surviving as an earthwork in nearby Friarhampstead Wood and English Heritage has considered Scheduling the ponds (Woolley pers comm. 2006). The use of the lower pond as a village water supply in the later post-medieval period is well known and it is likely that this had always been the case, despite the map designation of both ponds as 'sheepwash' ponds. The existing well appears to be 19th century in date, and resembles structures seen elsewhere (Dickens & Cessford 2007, 29; CH006) which house hydraulic ram pumps. Such a device would have made the task of water collection easier and according to locals there had been another well or pump closer to the road (SO207). However, until the well is opened it is not possible to know whether it is a ram chamber. The date of the steps or even their function is less certain. They may have been erected to help with water collection or to allow swimmers or fishermen access. From 1913 OS maps show a path leading directly

from the road to the steps on the pond.

The description of Greenmoor Ponds on the Oxfordshire HER demonstrates some limitations of this system. The original entry appears to have been based on map evidence and therefore fails to identify the additional features on the site, which demonstrate that their story is in fact more complex. There is no scope in the HER for the kind of site visit which would have identified the other features.

7.1.5 Hill Bottom Reservoir, Whitchurch Hill

In *c* 1886 Charles Laurence Weare Gardiner had a reservoir (SO120) constructed at Hill Bottom in Whitchurch Hill to collect filtered rainwater. The brick-built structure had an arched roof and measured 9.1 m by 2.4 m by 3.8 m deep. A pump house (SO121) stood alongside it with a caretaker to regulate its use. In 1927 it was filled in and two houses were built over it. When the site was sold for redevelopment in 1999 the excavations uncovered the reservoir and the area which collected the rainwater for it. The pump house had also survived (Whitchurch and Goring Local History Society 2003).

The family who had sold the site donated the pump house and various other items to the Whitchurch and Goring Local History Society. The group was able to obtain a Heritage Lottery Fund Grant and, with assistance from other bodies, has transferred the pump house to a permanent site by the Parish Hall and researched the reservoir's history. The original door of the pump house, which is preserved and visible inside it, had the conditions of use written on it (Whitchurch and Goring Local History Society 2003). The reservoir is unique in the area and the preservation of the painted notice (Plate 7.2c) is unusual.

7.1.6 Allotments, Little Milton

In July 2008 Helen d'Ayala of Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT) contacted OA asking for advice on a Victorian well (email 20/7/2008). The author arranged to visit the site in Little Milton to see the well (SO051) and provide some relevant advice. BBOWT was made aware by a local inhabitant of the existence of the well on allotments they own to the south-east of the village. The circular shaft is of standard Oxfordshire brick construction, with the remains of a square cover on the ground around it (Plate 7.2e). When the well was found there was little water visible, but the top layers of silt were removed and there is now clean water filling the shaft to a depth of around 1.5 metres. The full depth of the shaft was believed to be *c* 4.5 m, but the lower levels of fill were too difficult to remove with a pump.

BBOWT intended to restore the well, fitting a hand pump by its side so that allotment users would have access to a water supply. In its original condition when exposed it represented a hazard and the open shaft was fenced off. The major issue however lay with funding. The land belongs to BBOWT, which is a charity, but for wildlife. Using its limited, existing funds to pay for clearance and repair did not appear to be an option. The obvious source of funding for this type of project would be the HLF, but would they get sufficient local support and would the ownership by BBOWT be an issue?

The author was not able to provide much assistance, not having any direct experience of restoration. However, photographs of similar wells and details of a successful restoration in Bierton, Buckinghamshire (BU006) with contact information were gratefully received. The types of finds in the upper levels of the silt - 19th century pottery, clay pipe, coins etc. did not suggest that an archaeological excavation of the rest of the fill would merit the effort, which the health and safety requirements would make very expensive. High - pressure hoses and mechanical methods would still cost in the region of £1000-2000.

In the event money was found by BBOWT to fund pumping out of the well by an expert who works mainly on blocked sewers. Faced with a 'clean' job he enthusiastically but carefully removed finds, many of which were assigned a late 17th to mid 18th century date by John Cotter of Oxford Archaeology, suggesting when the well had first been sunk. It had originally stood next to a house. The interior of the well was in good condition, lined in typical Oxfordshire style with tile. Large flat stones were found covering the bottom, at a depth of *c* 2m. A manhole cover was installed over the hole, with a modern pump alongside (Plate 7.2d).

Coincidentally, allotment holders in North Hinksey decided in 2008 to investigate sinking a well. A site was selected with the help of a water diviner, and a pump (VW084) was erected over a borehole in early 2009 (Oxford Mail 2008).

These two projects clearly demonstrate that there is still a place for a non-mains supply, particularly where the water is not for human consumption. There is no reason to suppose that the water is unsafe, but certain expectations about guarantees of quality exist. At a time when the fear of litigation, if not actual legal action, is growing, supplying water from non-treated sources may be regarded as too high a risk. The decision to drain forty million litres of water in Portland, Oregon, USA in June 2011 after a man was recorded on CCTV urinating in the Mount Tabor Reservoir (Neves 2011) demonstrates these attitudes.

7.1.7 Comparison with European practice

A survey carried out for the Children's Food Campaign found that only 11% of the parks and open spaces for which a return was received currently provided water fountains. The 142 returns represented *c* 3% of all public open spaces in the UK. Fifteen parks, mostly in

London, contained 22 fountains in total, of which 12 were working. Only one Oxfordshire Park was included in this survey, Abbey Meadow in Abingdon (VW102), which does not have a drinking fountain (Haigh & Schnreider 2010).

Henley-on-Thames is very unusual for a UK town in having a working, modern drinking fountain in all its public car parks. A recent project between the historic Royal Parks and Tiffany & Co Fountains has set out to restore the drinking fountains in the Royal Parks, replacing them with new ones where repair proves impossible. The benefits are seen to include both the provision of clean drinking water and the reduction in the number of discarded plastic water bottles. In addition, in 2009 the Freeman Family foundation funded the first new drinking fountain (LO003) in Hyde Park for 30 years (Royal Parks press releases 2009-12).

During visits to a number of European countries the author has noticed a difference in how public water sources are considered in comparison with the UK. The vast majority are still connected to a supply even if they are unlikely to be used regularly. This applies from large cities through to remote rural areas.

A large 19th century pump (801) in Klausener Platz (Plate 7.3a), a modern street opposite the Charlottenburg Palace in Berlin, still works well. Elsewhere in Germany, at Müllenbach, a former open-air wash-house (803) has been carefully maintained (Plate 7.3b), although it is unlikely to be used again.

The continuing use of fountains and troughs was also witnessed on several occasions in Spain. Washing dustbins was carried out at a fountain in Pamplona (819) and a farmer stopped to drink from the trough in Bioxols (820). Working drinking fountains were seen in Saragossa (824), Roda (822), Benasques (823) and Garaioa (831), just like a Glenfield

and Kennedy lion head design (Plate 7.3c).

In France not only are fountains kept in working order, but many facilities are clearly designated as being '*potable'* or '*non-potable'*, sometimes with both types available from the same feature, as at St Antheme in the Auvergne (812, 813) (Plate 7.3d,e). In 1995, 0.5% of people in rural areas of France did not have access to piped water supply, relying on 30,000 water points, most of them wells (Ministry of Agriculture 2003). A new variation on drinking fountains was introduced in Paris in 2010 with La Pétillante (834), a fountain which delivers a choice of still or carbonated water. The initiative is intended to increase confidence in tap water and reduce the use of bottled water (Davies 2010).

With no lack of mains water or different public health legislation (WHO 2013), causes for the differences are uncertain. The British may find it easier to sue if water proves contaminated or have different perceptions of what is hygienic. It possible that in the cooler, wetter climate public facilities were less necessary and did not justify maintenance costs.

7.1.8 Global water supply

Among the threats of climate change is a reduction in access to a water supply to millions of people, with resultant possible conflict. Even now shortage of water or contaminated supplies are responsible for extreme hardship and many deaths, not just during periods of drought or natural catastrophe. Across the world the typical quantity of water used per person per day is *c* 10 litres, the amount that can be carried comfortably, given that many need to travel some distance to obtain water and may do multiple trips each day (Souter 2011). In the UK the average is 150 litres per day (Environment Agency 2012).

The problem globally lies not with the total amount of water on the planet, but with its distribution, availability and safety. Solutions include increased efficiency, changes in water uses or increases in supply. The last is expensive, but given the political will there are solutions to water shortages in vulnerable areas (New 2011). Aid projects are installing pumps to improve village supplies and the University of Oxford is involved in research for remote monitoring to ensure that pumps are repaired promptly when required. An experimental version has been installed in the garden of Kellogg College.

In the developed world plentiful, pure water and efficient removal of sewage and other waste products are taken for granted. Each year individual consumption figures rise and a temporary ban on the use of hosepipes or similar control measures cause public outcry. This unlimited access is under threat: in April 2012 hosepipe bans came into force in seven water authority areas in the southern part of the UK (Vaughan 2012). There is no shortage of water across the UK as a whole, but no infrastructure exists for ensuring even distribution. One approach to relieving local shortages might be initially to reactivate some of the surviving pumps and wells, at least for car washing, garden watering etc. The impact on the water table would need to be monitored and issues of water quality addressed before the majority of people would be persuaded to use these supplies for drinking water.

7.2 Water and Gender

Whatever supply system was adopted it is clear that until piped hot and cold water was provided, ensuring an adequate supply for a household entailed considerable effort on a daily basis. It is also clear from numerous studies in developing countries that the responsibility for this fell predominantly on women. (Coles 2005, 80-1). In the developed world, the North Carolina Farmer's Alliance calculated in 1886 that a woman would cover 6,068 miles collecting water over a 41 year period (Strasser 1982).

No specific studies relating to gender were identified for the UK, but there are references to collecting water in the literature and in contemporary illustrations. It would appear that paid water carriers were male, and indeed the 16th century Company of Water Tankard Bearers in London was forbidden by statute to employ women. However, collection of water for individual households was usually work for women or children. William Lamb made special provision of water from his conduit (LO004) for poor women in Snow Hill, London (Barty-King 1992, 35-7).

Illustrations from Oxfordshire show this same pattern. Yokes with buckets suspended were often used and a photograph of women in Beckley in the early 1900s (Plate 7.4a) includes a girl with a yoke (Wheeler 1999, 3). One woman from Nuney Green carried bottles of water back from her job at Mapledurham House two miles away and boys attending school in Mapledurham would take yokes to school with them and fill buckets on the way home (Preece, 2000-1, 9,12).

Pictures of the Maharajah's Well (SO010) at Stoke Row (Plate 7.4b) show both sexes carrying water (Preece 2001, 9) and an engraving from 1872 shows a man filling a woman's bucket (Spencer-Harper 1999, Cover), indicating the physical labour of operating some wells and pumps. The bucket of the Maharajah's Well took 10-15 minutes to winch up and one villager said in 1939 that she needed two people to help her (ibid, 43). Highmoor well (SO005) likewise needed two people to operate it (ibid, 50). There was also a change in attitudes to gender roles from the late 19th century. Flora Thompson writes that visiting the well was a job for the women, although some younger women who had been in service elsewhere would get their husbands to do the job at night. Initially this was seen as an imposition after the men's hard days labour, but it soon became common (Thompson 1954, 7).

A similar division in the distribution of labour has been recorded in contemporary Africa. In central Sudan men fetch water where it is difficult, for example wells over 30m deep, or far from the village, in that case more than half a mile away (Cole 2005, 80). The short distance reflects cultural attitudes to contact between women and strange men, which was not an issue in post medieval Oxfordshire. Another issue in developing countries is the way in which tasks such as water collection keep girls out of school, again not applicable to Oxfordshire. The scale of the problem was described in a letter from a girl in Ethiopia, received through an Action Aid sponsorship scheme which installed taps:

> *Because there was no water in my village, I had to get up at 2 am to walk two hours to the nearest river. During the dry season... the level of the river was .. low. Sometimes it would take so long to collect water that I would miss school.*

Stories of life in Oxfordshire in the early 20th century make frequent reference to the chore of collecting water, but seldom stress the burden it placed on women:

> *My neighbour with whom we shared the well was lucky enough to have a landlord who provided her with an electric pump.*
>
> (OFWI 1994, 57)
>
> *My brother, being the eldest, bathed first, my sister having carried upstairs for him several buckets of hot water from the kitchen copper.*
>
> (OFWI 1994, 59)

It is difficult to imagine how much lives, particularly for women, were changed by the provision of mains water and flushing water closets.

7.3 Housing Design and Society

During the post-medieval and modern periods, the organisation of English society has

undergone a number of changes, which are reflected in housing designs including the provision of water and waste disposal. Changes in these also reflect changes in attitudes to cleanliness.

Matthew Johnson (1993) explored the transition from open hall houses to closed, lobby-entry houses in rural Suffolk in the late 16th and 17th centuries, drawing parallels with the move away from the custom of the lord and retainers living closely together, sharing eating and working areas. Within the hall it was still easy to reflect the hierarchical structure of society (Johnson 1993, 55). As the upper stratum came to demand increased levels of privacy, the family ate and slept in private apartments. The hall decreased in importance while lobbies restricted ease of entry and access to the lord as society constrained the different classes to operate in separate spheres. This increasing polarization of society extended to water and waste, and the related systems installed in the home.

In the mid 16th century, in both rural and urban contexts, the main sources of water were wells, rivers and streams. Only the highest and richest members of society were able to pipe water to their houses; for example, Lord Bacon had a conduit house (HE001) built to supply Gorhambury, Hertfordshire (Girouard 1978, 248). Even where there was piped water in a town, few were allowed to install a 'quill' enabling them to connect directly to the supply. Similarly all were equipped with toilets consisting of a seat erected over a pit or, in the case of castles and large buildings, a chute emptying into the moat or a ditch (Priestley 1970, 97). The garderobe towers are still clearly visible at Beckley (SO108) (Girouard 1978, 248).

Upper class houses from the later 17th century were much more formal in design, accommodating the servants in separate quarters served by a back stair, reinforcing the

separation between classes. Improvements were carried out to water supplies, so that most would have a piped supply into the house itself. Although water wheel-driven pumps were increasingly used to provide water, at Blenheim (WO005) for example, it was still seldom provided above the ground floor. Some houses still relied on roof cisterns to collect rain water. Later, steam engines were installed to pump water and sewage, as at the Rothschild estate at Ascott, Buckinghamshire (BU007) (Palmer 2005, 99). Blenheim was unusual in having a bath with hot and cold running water in the basement and Carshalton House, Surrey (SU001) may have had a similar arrangement. Cold baths were much more common, like those at Rousham (WO056) and Heythrop (WO138) (Plate 7.4c).

Several estates, including Waterperry (SO107) (Plate 7.4d) and Woodeaton (SO001), had water towers for storage. Water closets had been invented by Harrington in the 16th century, but until Bramah produced his improved valve design, earth closets tended to be more popular, although Chatsworth (DE001) had ten WCs. Chamber pots and close stools were also widely used. Piped water enabled the provision of "buffets", built-in sinks, in dining rooms. Bathrooms were also installed in large town houses during this period (*op cit* 251-6).

Refinements in the design of WCs, which reduced the risk of unpleasant fumes, and the invention of gas geysers in 1868 meant that by the end of the 19th century a luxurious bathroom could be expected in an upper-class house. Despite this, some considered privacy more important, and persevered with close stools and slipper baths so guests were spared the embarrassment of being seen visiting a WC (Palmer 2005, 99). Even where bathrooms were installed however, these refinements were not necessarily extended to the servants, who frequently had to make do with an earth closet in the grounds. (Girouard 1978, 265). Resistance to bathrooms continued into the 20th century in places;

Ditchley Park (WO195) only had one bathroom in 1932 (Nicolson 1978, 234).

The upper classes and gentry had consisted of those families which had traditionally owned large areas of land. During the later post-medieval period a new land-owning group developed, comprising those who had made money in trade, the nabobs of the East India Company for example, and then from manufacturing. At the same time income from land was uncertain. Although their advancement was resisted, the nouveaux riches were gradually assimilated, particularly through aristocratic marriages. The Churchill family made several marriages with heiresses from the USA, whose money helped fund improvements to Blenheim and its estates, including systems for supplying the fountains of the water garden (WO053; WO131; WO132) (Plate 7.5a) with water from Rosamund's Well (WO006) (Bond & Tiller 1987, 131). Slowly the difference between the upper classes and at least the upper middle classes began to soften.

For the middle and lower classes there was little change until later in the 19th century, although more urban houses had a piped water supply. The major difference between these two groups related to levels of overcrowding and the employment of servants who could supply hot water where required. Flora Thompson describes the forge and Post Office at Candleford Green (really Fringford (CH225)) as having several wells, a pump and a bath-house in the former brew house, although the post-mistress had hot water taken to a bath in her room (Thompson 1954, 490).

In rural areas, as enclosure of land increased, the divisions between the social classes became more pronounced. Yeomen and tenant farmers became more distinct from the agricultural labourers, who became dependent on paid employment (Williamson 1995, 17). Those labourers living within closed parishes also depended on the large landowners for their housing and often their water supply. Conditions varied, but in general the

standard of housing in closed parishes was higher, particularly where the village was moved or rebuilt to fit in with the parkland landscape. Plans for some of the new houses, such as those constructed for the Bishop of Durham at Mongewell (SO197), show there was a privy in a separate outhouse, but no water supply (Airs 2001, 399). Lord Harcourt's houses at Nuneham Courtenay (SO199) are thought to have been similar, but at Holkham (NO001) the Earl of Leicester provided a wash-house in addition (Barley 1961, 50). The slow progress of improvement in the countryside was discussed more fully in Chapter 5.

To maximise the fluctuating economic returns obtained from agriculture, landowners adopted new technologies and farming practices, which resulted in the loss of many jobs on the land. This, combined with the growth of manufacturing industry and the harsh poor laws, resulted in large scale movement of the population towards towns, putting pressure on the housing supply. In 1801 only 33% of the population lived in towns, but this increased steadily from 50% in 1850, 72% in 1891 to 79% in 1911 (Rodger 1989, 7). The working class lived in squalid, overcrowded conditions and turned to crime and drink in large numbers. Disapproval of such life styles led to increased separation between the working and middle classes. Building of tenement blocks by philanthropists, discussed in Chapter 6, had a limited impact on the position of the working class (ibid, 44-6).

The town houses of the upper and middle classes were transformed during the later 19th century as piped water became more widely available. Indoor WCs and fitted bathrooms became almost standard, many equipped with geysers or even showers, particularly in new houses constructed on the outskirts of towns. Even if there was no bathroom, a tip-up bath could be fitted into a cupboard and in kitchens baths with hinged table-tops were not unusual. Later, sunken baths appeared in kitchens, at the Bourneville estate (WM001) for example (Darley 1994, 141).

New building on the outskirts of towns was carried out by speculative builders, who catered for two groups of purchaser: those who sought cheaper rents and were in a position to commute and the middle classes, who aspired to the lifestyle of country gentlemen. In Oxford, New Headington, built in the 1850s to the west of Windmill Road, catered for the first group, while its proximity to the notoriously unruly settlement of Headington Quarry deterred the second (Graham 1990, 150-3). Middle class housing was built in Headington after 1879 when the Highfield Estate was sold and also at Pullen's Lane, closer to the city (ibid, 155). Further out of the city, there were developments at Boars Hill and Radley.

The best studied middle class development in Oxford is in north Oxford on land released for building by St John's College from the mid 19th century. Two architectural styles predominated, the Italianate, as exemplified by Park Town, and Gothic, which proved more popular. Park Town has two crescent-shaped terraces surrounding an oval garden, reminiscent of Bath, and a number of detached villas designed by Seckham (Hinchcliffe 1992, 94). The detached and semi-detached properties which make up most of the area were also designed by well-respected architects, such as Bruton, Codd, Jackson and Wilkinson (ibid, 112).

The plans of these houses show that at least one WC was always present and, although bathrooms were common, they were not the rule, for example 113, Woodstock Road (OX129) (Hinchcliffe 1992, Plate 39). Some had several WCs for the family, such as 13, Norham Gardens (OX128) (ibid, Plate 43), but it was common for the servants to access their WC from outside the house, as at 60 Banbury Road (OX130) (ibid, Plate 42) (Plate 7.5b). By the early 20th century the level of facilities had improved. At 1, Belbroughton Road (OX133), built in 1926, there was a downstairs cloakroom with WC and upstairs, in addition to a family bathroom and WC, there was an en suite

bathroom shared by two bedrooms. The servants' WC opened off the scullery (ibid, plate 82). The WC was always separate from the bathroom.

Such refinements were not available to the working classes. The Oxford working class districts of Jericho and St Ebbe's were built *c* 1820, but the houses were not of high quality, having no water supply, a scullery and buckets for toilets. Ditches emptying into the Thames were provided for drainage. In Friars Street (OX131) one well and joint use of a pump were provided for tenements in multiple occupation (Morris 1971, 94). Later housing across the county was rather better, with a WC in the garden and often a tap in the scullery (Paine 1978, 191). Naldertown, Wantage (VW109) was built for employees of Nalder's Foundry before 1877. The 12 houses in the terrace all had an extension with a sink, copper, pump over the sink and WC, with water coming from wells shared by two houses (ibid, 206). William Wilkins was responsible for The Causeway (CH250) in Banbury's new suburb of Grimsbury in 1856-71 (Plate 7.5c). There was a copper in the kitchen and a WC to the rear, 2m from the back door. However, drainage was a problem and there were frequent complaints (ibid, 202-4).

There should have been improvement in working-class housing following a series of Acts of Parliament: The Public Health Act of 1875 required local authorities to comply with building regulations or bye-laws, making each house self-contained, with its own sanitation and water. However, few such houses were built in Oxfordshire other than in the Banbury and Bullingdon Rural District Council areas (Paine 1978, 192). There are still large areas of 19th century terraced houses in Banbury.

Erosion of the class divide in the 20th century was a slow process, helped by two world wars among other things. Conscription in World War I left the upper classes without most male servants and often female staff also left to replace men in occupations

previously closed to them. After the war, many of both sexes did not wish to return to service (Girouard 1978, 309). The upper classes themselves were badly hit by the high casualty rate, leaving many without an heir and with large inheritance bills, which led to the sale of many estates (Rowley 2006, 274) . For those of the upper and middle classes who were left without domestic help the provision of bathrooms and kitchens with built-in sources of hot water would have been highly desirable.

Those returning from the trenches were faced with a massive housing shortage, which was addressed through government subsidies to fund 'Homes for Heroes' (Priestley 1970,180). The designs of these new homes were informed by various advisory boards, including the Women's Housing Sub-Committee of the Advisory Council to the Ministry of Reconstruction, who said 'a bathroom is essential' (Burnett 1978,219). The role of the kitchen was also debated and possible layouts included:

a) a range in the kitchen and scullery with gas cooker, sink, copper and bath;
b) grate in living room, separate bathroom;
c) no cooking in the living room, upstairs bathroom.

According to the Local Government Board's 1919 Housing Manual every house was to have an internal WC, usually sited off a back lobby and a bath in either a bathroom or the scullery. (Burnett 1978, 219-21). Not all the new houses met these specifications and the hot water for the baths was often hand pumped from the copper.

Following World War II the growth of the Morris Car Works in Cowley, Oxford at a time when many industries were in recession, attracted workers from all over the country as well as the local area. In response to the demand for accommodation both the city Council and private builders constructed some large estates. Clive Road, part of a small

precursor to Florence Park, was built in 1929, each house having a combined bathroom and toilet on the first floor. Hot water was provided from a back boiler in the rear living room and there was an airing cupboard in the bathroom (Paine 1978, 213-4).

Of course these plans presupposed a piped water supply and in many rural areas this was not the case until well after World War II. Housing subsidies did not extend to major infrastructure projects. When council houses were built in Kidlington in 1921 a new well (CH165) was dug to supply them (OFWI 1994, 11). Several early 20th century groups of council houses in Cherwell District were noted by the author where a pump formed part of the design, including Milcombe (CH127), Fritwell (CH189) and South Newington (CH182) (Plate 7.5d). Other examples from South Oxfordshire are at Warborough (SO056) and Wheatley (SO180).

However, the subsidies did not address the issues of the millions of existing houses, of which around a third were more than 80 years old by 1951 (Burnett 1978, 277). An example from Bloxham illustrates the appalling conditions under which some people were forced to live. A cottage in Queens Square (CH253) had no sink or water supply, with all water fetched from a communal pump. There were 29 households in the square and one communal lavatory (Paine 1978, 199). Similar squalor existed in rural areas and greeted the journalist Robertson Scott when he moved to an Oxfordshire hamlet, Idbury, in the 1920s. Robertson Scott published semi-fictional descriptions highlighting the poor facilities in rural areas, without naming any villages. The cottages were leaky, the floors dug out below ground level and hence damp, and the privies at the bottom of the garden were falling apart and often shared, while the water supply was some distance away. Robertson Scott describes employing a new garden boy, who had never had a bath in his life and didn't know how to wash himself (Robertson Scott 1947, 16, 20, 25). From 1954 housing subsidies were targeted on slum clearance, but the process was slow. In 1961 of

a total of 6,504 households in Banbury, 231 had no water closet, 1,325 had no fixed bath, 1,643 had no hot water tap, and 98 had no cold water tap. (VCH Oxon X 1972, 71-89). The problem was tackled through rear extensions, conversion of bedrooms and by rehousing.

The working classes had to wait until the second half of the 20th century before they could expect to have WCs, fixed baths and hot and cold running water provided in their homes. The pace of change has accelerated and now a cloakroom with a WC is commonly provided as well. Many bathrooms have showers as well as or instead of baths. There are also many new houses in which there is an en suite bathroom in at least the main bedroom (Burnett 1978, 267-8). These features, which were available to the upper classes by the 19th century, are now accessible to anyone with sufficient money.

The changes in the provision of baths and WCs and their layout illustrates how attitudes to cleanliness have changed. At the beginning of this period, in the mid 16th century, bathing was a rare event, which for many people only happened when they immersed themselves in a stream or river. Bathing, particularly hot baths, came to be associated with immoral behaviour. Cleanliness was associated with clean linen rather than water (Ashenburg 2007, 106-7). The phrase 'cleanliness is next to godliness' was intended by Wesley to refer to dress rather than bodies (ibid, 131).

From the 17th century bathing for health grew in popularity, and then became linked to cleanliness. By *c* 1800 the leader of fashion, Beau Brummel, was advocating a daily all-over wash (Ashenburg 2007, 150). Around the same period the Salop and Liverpool Infirmaries (SH001, ME001) were opening their baths to the public, although at 1/- per person they were only accessible to the middle classes (Smith 2007, 243). Laundry was also done more frequently and the monthly or seasonal wash was being replaced by a

weekly one (ibid, 232).

Increasing availability of piped water made regular bathing a possibility for the upper and middle classes who, once odour free, noticed that the working classes smelled. Thackeray coined the expression the 'great unwashed' in the mid 19th century, a description that was still applied in the 1930s when Orwell recorded being taught that 'the lower classes smell', although he also described why this was difficult to avoid for many of them (Orwell 1962, 112). The phenomenon did not help bridge the class divide.

As scientific advances demonstrated the link between dirt and disease, the drive towards cleanliness gained momentum. Easy to clean white porcelain was adopted for sanitary fittings and laundry was boiled (Smith 2007, 299). Bathrooms became a standard fixture in better homes in the 19th century, Dickens having one installed in 1851 (Ashenburg 2007, 162).

Attitudes to sewage also changed slowly. The close stool and chamber pot of necessity if not choice remained in use, but the cess pit and earth closet were usually situated at some distance from the dwelling, where smells would be less noticeable. Indoor water closets were unpopular until Bramah had designed an effective valve to prevent sewage vapour intruding. Even so the WC was at first located across a yard, then accessed from the outside and only later moved inside the house. Many felt that a WC had no place in a bathroom, and Dickens had his partitioned off to keep the functions separate (Ashenburg 2007, 162).

For many, bath night was a weekly ritual when the same water was used by everyone from the youngest first, particularly when the bath needed to be filled with water heated on the stove. This, and the idea of a fixed bath in the kitchen, is no longer acceptable

(Strang 2004, 74-5). Today a daily bath or shower and change of clothes are regarded as the norm (*ibid.*, 199), an idea that has spread from the USA, where it was adopted in the 1950s (Ashenburg 2007, 261). Post World War II personal hygiene advertising and consumerism have established the idea that everyone must have a shower and a washing machine and promoted the use of deodorants and other cosmetics, even for men (Smith 2007, 330). For some even a bath is not now seen as clean, but as sitting in dirty water (Strang 2004, 75).

Whether climate change and water shortage will produce a further change in attitudes remains to be seen. There are those who refrain from flushing WCs after each use in order to conserve water, although there are social embarrassments associated with this (Strang 2004, 203). Among the recommendations for relieving the 2012 water shortage is to collect so called 'grey water', such as bath water, for watering the garden (Fryer 2012). Some new housing is plumbed for this and for flushing toilets (Environment Agency 2011). The name 'grey water' seems unlikely to encourage the practice.

The study of water supplies illustrates the impact of social class on people's lives and their attitudes to each other. While the better off were able to receive piped water and by the early 20th century rely on having fixed baths and indoor WCs, this was not the case for many of the working classes until the later 20th century. The differences between the slum housing of St Ebbe's and the elegant villas of north Oxford illustrate this clearly.

This section has also explored how attitudes to cleanliness across all strata of society have changed since the 16th century. At the beginning of the period bathing was rare, but the bath itself is being replaced by showers. Attitudes to and expectations of water supply continue to change.

7.3 Memorial and ritual

Water plays its part in ritual and memorial within an urban context and many of Oxfordshire's holy wells discussed in the previous chapter were located within towns. Walton (or Bruman's) Well (OX028) gave its name to the major road through Oxford's Jericho district and in 1885 a drinking fountain was erected on its site. This was paid for by Alderman Ward and the inscription includes the instruction 'Drink and think of Him who is the fountain of life' (Saint 1970, 95).

Drinking fountains are very common memorials to events or people and can be found across the county in towns and villages. Most were erected at the expense of a wealthy public official, like Alderman Ward above, or in rural areas the lord of the manor. In Spelsbury (WO018) and its hamlet, Taston (WO058), the Dillon family is commemorated by a pair of fountains. According to the inscription, the North Aston fountain (CH016), restored for the millennium, was paid for by William Foster Melliar. The Churchill fountain (WO017) (Plate 7.6a), dating from 1870, commemorates James Langston, and was erected by his daughter the Countess of Ducie (Pevsner & Sherwood 1974, 545). This structure is an unusually large gothic design with multiple spouts, and a strong resemblance to the Carfax Conduit. These two examples are very unusual in still giving water.

The Phillimore Fountain next to the church in Henley (SO014) commemorates the tenure of a former vicar, Greville Phillimore. It was erected in 1885 in a more prominent situation at the central crossroads (SO090) but moved in 1903 to reduce traffic congestion. Restoration in 2008, not unfortunately of its water supply, was part-funded by his great grandson, Lord Francis Phillimore (Henley Standard 2012). The Hawkins Drinking Fountain (SO011) in Wallingford was installed in 1885 to replace a hand pump. The structure, made by Macfarlane of Glasgow, was paid for by Alderman Hawkins,

whose draper's shop *Field and Hawkins* overlooked the site (Dewey & Dewey 2010). In 1921 another Hawkins, Sidney, paid for it to be relocated to Bullcroft, a public park, to make room for the war memorial, but it was restored to its original location in 1979 (Beasley 2004, 127).

The fountain at The Plain, St Clements, Oxford (OX005) is one of several erected to commemorate Queen Victoria's Diamond Jubilee, and was paid for by the Morrell brewing family. Another can be found in Playing Close, Charlbury (WO001). The Kibble Fountain (Plate 7.6b) jointly commemorated the visit of Queen Victoria in 1886, the provision of piped water in the town in 1896 and the Diamond Jubilee in 1897 (VCH Oxon X 1972, 131-132).

More unusual is the drinking fountain at Shipton-under-Wychwood (WO019), erected to the memory of 17 villagers drowned when the *Cospatrick* sank in 1874 as they emigrated to New Zealand (OFWI 1999, 194).

Ornamental fountains continue to be erected as memorials, the most famous recent example being the Diana Memorial Fountain in Hyde Park. In Thame, the Pearce family erected one (SO052) in 1926. The combination of a fountain or other water features with war memorials is rare. Using the UK National Inventory of War Memorials, no such examples were identified in Oxfordshire or Berkshire and only one in Buckinghamshire, at Chesham Bois (BU002). The inventory currently lists some 62,000 memorials of which 46 are fountains and 15 troughs (UKNIWM 2012). In addition one at Skenfrith has a trough built into an enclosure around a cross (GW001). In general, war memorials do not serve a secondary function, but four church clocks are recorded in Oxfordshire, from a total of 300 nationally. Given the association between water and cleansing or rebirth (Strang 2004, 84), this lack of water in war memorials is puzzling. A possible explanation

is that they are designed to represent individuals whose contributions set them apart from the general population and general access to the water would remove this distinction. In Colchester a public meeting in 1919 placed public baths on the shortlist for the choice of war memorial, but a conventional monument was eventually chosen (Tiller 2013, 31).

The motivation behind the erection of memorial fountains is not simple. A drinking fountain will provide a useful resource for the community, as exemplified by the Langston Fountain (WO017), which is equipped with multiple outlets and a water-filled trough extending around all four sides. The unanswerable question is one of balance between helping the community, a desire to perpetuate a memory and the opportunity to demonstrate the donor's status. For local landowners the donation was another demonstration of their power in the area and for politicians it was a possible aid to gaining and maintaining support. The St Clement's fountain (OX005) was funded by the MP Philip Morrell, Walton's Well (OX013) by an alderman and the well at Whitchurch Hill (SO119) by a High Sheriff of Oxfordshire. As always, if drinking water was needed in an area, then a philanthropist need not wait for a further excuse of a memorial. The locations of these fountains are generally prominent within the settlement, both for the convenience of users and as a clearly visible symbol. The St Clement's fountain occupies a key position between the suburb and the city of Oxford itself, possibly chosen to demonstrate a separate sense of identity and worth. The toll house, a clear marker of the divide from the city, had stood there until 1874 (Oxford Preservation Trust 2010).

Religion and water have long association. For Christians, baptism is an important rite requiring a font or, in the case of non-conformist sects such as the Baptists, a total immersion pool. Water also has its part in Jewish ritual and excavations at Magdalene College, Oxford uncovered a pool with stairs leading down to it, which was identified as a possible mikveh or ritual bath (OX057). The site of Magdalen College was occupied by

Oxford's Jewish population in the medieval period, with a burial ground located on the opposite side of High Street, and mikvaoth are often connected to cemeteries. Jews were expelled from England in 1290, but they began to return to Oxford from the 17th century. From 1848 a series of different sites were used as synagogues, the current one is in Nelson Street, Jericho. In 2008, for the first time in the modern era, a mikveh (OX092) was opened at the Chabah House Jewish Centre in Cowley Road (Roberts 2001-8).

7.4 Summary

Despite the existence of the various historic environment designation and recording systems, it is clear that the survival of historic water features is best served where a particular individual or group takes responsibility for it. This may be its owner, a parish council, a heritage conservation body or a non-heritage related community group. A number of initiatives discussed above suggest a resurgence in use of historic water sources. In mainland Europe the older public water sources have often remained in use in both urban and rural areas, albeit with some consideration of modern expectations on water quality. New drinking fountains are more common on the continent. As population increases and climate change put water supply under increasing pressure, reconsideration of how water is used and alternatives to pure treated water from the mains will become increasingly important.

Where mains water is not provided it is usually the task of women and children to collect sufficient supplies, particularly in Third World countries. There is evidence that a similar situation existed in Oxfordshire, continuing into the 20th century in areas such as the Chilterns in its south-west.

Accommodation of indoor water supplies, lavatories and eventually bathrooms into housing designs evolved slowly. Facilities were provided for the upper classes first, but the rate of change for all classes was much quicker in urban than rural areas. Some

country house owners preferred to pay for the luxury of servants rather than install bathrooms. An indoor privy, even a WC, only slowly came to be regarded as clean. As people have come to take an unlimited supply of water for granted, attitudes to bathing have changed, encouraged by the advertising industry, so that a daily shower is seen as essential by many. By the later 20th century the difference between social classes in their ability to meet these expectations had almost disappeared.

Water has been linked to ritual since the prehistoric period and the provision of a water supply has been a popular form of memorial. These are usually dedicated to a particular individual, but sometimes commemorate particular events such as royal jubilees. The motives of donors are often less obvious, and philanthropy may mask more egoistic aims, such as political influence. Surprisingly, few war memorials take the form of water features.

8 CONCLUSIONS

8.1 Overview

The aim of this research has been to demonstrate that a study of the provision of water supply during the post-medieval and early modern period can make a valuable contribution to understanding how society operated in these periods. It uses Oxfordshire as the case study accompanied by comparisons with other parts of the UK and with mainland Europe. The time period covered extends to the early 1970s when the large water companies were established and the slow process of change in water provision prior to that time is described.

8.2 Conclusions

This thesis had four aims, as discussed in Chapter 1. These were:

- to document the archaeology of water supply;
- to demonstrate a significant contribution to the understanding of social history;
- to investigate protection under existing Historic Environment legislation, guidance and recording systems;
- to explore attitudes to and perceptions of water supply.

The key findings for each are given below.

8.2.1 Archaeology of water supply

A historical review of water supply and the development of related technology is included in Chapters 3 and 4 with particular strands developed in more detail in Chapters 5-7. This is informed in large part by the archaeological evidence provided by the surviving features identified in this research, supported by documentary records.

Using a wide range of sources, 910 water-related sites from Oxfordshire were identified, for 655 of which some evidence survives. These sites were classified into 34 types, grouped in 7 categories for the purpose of the analysis described in Chapter 4. The largest category was Supply, with 72.4% of the total (659 sites). Storage was the next at 12.4% (113 sites). None of Processing, Leisure/Ornament, Health/Cleanliness, Waste and Miscellaneous represented more the 6% of the total. Only five types of feature were represented in significant numbers. Wells comprised 22.3% of the total (203 sites), pumps 17.1% (156 sites) and springs 5.9% (54 sites) with holy wells and water towers both representing 6.5% (59 sites).

The distribution of sites across the Districts was Cherwell 28.1%, Oxford City 15.2%, South Oxfordshire 22.3%, Vale of White Horse 12.2% and West Oxfordshire 22.2%. The lower percentage for Oxford City reflects its smaller area and that for the Vale of White Horse its long history as part of Berkshire. The level of documentary sources for that county is lower than for Oxfordshire.

The post-medieval period provided 67.1% of the sites recorded (611 sites). Of these 44.2% (270 sites) could not be assigned to a particular century, but most are probably 19th century in date. Of the post-medieval total, 41.2% (252 sites) are from the 19th-century. The number of sites from the 16th century was around 1.2% (7 sites), the 17th century 5.2% (32 sites) and the 18th century 8.2% (50 sites). The modern period contributed 13.1% (119 sites) of the total.

It was not possible to date 9.3% of the total (85 sites). Of the 9.2% (84 sites) from the medieval period 68% (54 sites) were holy wells. The number of sites of known earlier date was very small, 1.2% (11 sites) of the total.

From the 15 larger late 19th- and early 20th-century waterworks identified, none of the steam engines have survived, although some buildings still stand (OX019, SO088). However the gas-powered pumps installed in County Hall to supplement the Abingdon supply have been preserved *in situ* (VW055).

Place-names, patterns of early settlement and the development of towns demonstrate how important water supply was to a settlement, the pattern of distribution reflecting the different geologies across Oxfordshire (Figures 3.1, 3.4). In the south of the county, on the chalk, natural water sources are scarce in comparison with the limestone areas in the north. Of the 910 features identified 48.6% were in limestone areas, 33.7% on clay and only 9.7% and 8.0% were found in on chalk and sand geologies respectively. The figure for clay includes sites in Oxford itself, where the density was particularly high. The difference is also displayed by Registered Parks and Gardens, 53% on limestone and none on chalk, and by holy wells, where 62.9% were found on limestone, 6.6% on sand and only 3.3% on chalk. The over-riding factor influencing water supply is geology.

These differences are reflected in settlement density with many isolated hamlets in the south on the chalk and larger nucleated villages in the north (Figures 4.5, 4.6). Deep wells were dug into the chalk in the 19th century, for example at Kidmore End (SO009) and Gallowstree Common (SO008), while springs had always supplied the tites of Hook Norton (CH062, 054, 122, 172) and Upper Heyford (CH068).

Even when social factors such as the difference between open and closed parishes are considered (Section 4.4.2), the over-riding importance of geology for water supply is apparent. The closed parishes are more common in the arable limestone areas of West Oxfordshire, reaching 58% with only 7.4% open parishes. The creation of the large land holdings which led to the establishment of the tightly controlled closed parishes took

place in the areas where geology favoured arable agriculture.

This study has explored distribution patterns for water features from particular manufacturers (Figures 4.35, 4.36), although – apart from the distinctive Wilder of Wallingford wells (Plate 4.4d) in South Oxfordshire (Figure 4.37) – it is often impossible to identify the make. The mass-produced products of these companies in the late 19th and early 20th century were mainly of similar designs, although Glenfield and Kennedy (Plate 4.1c) and H M Baker (Plate 4.2a) were exceptions in this respect. Much more variation in design was apparent in the one-off features, which often served as memorials. Another cluster identified was roadside taps, of which over 50% were installed in Cherwell District.

8.2.2 Water and social history

The analysis of sites in Chapter 4 formed the basis for the detailed studies of their contribution to social history in Chapters 5, 6 and 7, the second aim of the thesis.

Across society water has been used in religious practices. Many of the *c.* 150 medieval holy wells identified in Oxfordshire, mainly found in limestone areas (63.9%), were associated with the healing powers of water. In the post-medieval period, the church authorities tried to suppress associated rituals (OX042, OX043), although recently interest has revived, including the Palm Sunday practice of visiting the well in Wilcote (WO043). Many holy wells were lost, for example Cottmoor Well, Thame (SO081), or became part of the supply system, such as the Ruddy Well, Stonesfield (WO067), but a few developed into spas, although none prospered in Oxfordshire. The use of spas was mainly confined to the wealthier classes (Section 5. 9.3). Water also has a long association with health. Drinking of spa water was common and mineral waters were produced in a number of locations across the county (WO052, WO153, BE002) and the

Blenheim Estate (WO187) is still a supplier to the current bottled water market.

Many Oxfordshire towns, had a municipal supply before the end of the medieval period, for example Abingdon (VW001). The technological development of water supply during the post-medieval period was marked by improvements in water wheel design in the 17th and 18th centuries (OX15), followed by the introduction of hydraulic ram pumps in the early 19th century (VW013, CH003). The use of steam engines for pumping (OX019, SO088) represented the most significant improvement for supply, although the benefits were not delivered to some rural areas until the mid 20th century. Progress was non-linear, with the use of wells (SO119, WO038) and manual pumps (VW003, CH009) for example continuing alongside more sophisticated techniques such as turbines (WO185) or steam engines (CH014), as illustrated in Chapters 5 and 6. Water supply improved overall during the post-medieval period, but the rate of progress varied between rural and urban environments and across social classes.

The water features of Oxfordshire illustrate clearly how much disparity there was in the availability of clean water and effective drainage to different social classes until the later 20th century. Supply systems, at Coleshill for example (VW096), cold baths such as at Rousham (WO056) and fountains like those at Blenheim (WO053) were found at the large country estates. These contrast very starkly with the village pump still being provided to supply new council houses in the 1930s, for example in South Newington (CH182). These facilities did not conform to policy recommendations of the time, raising the issue of public funding for housing after World War I. However, anecdotal evidence shows that these houses were regarded as great improvements by their new occupants (OFWI 1994). Greys Court (SO006) had an effective well from the 16th century, while the villages around, sharing the same chalk geology, were forced to collect water from distant rivers until the late 19th century. Access to a plentiful water supply was

easier for the upper classes.

Differences in provision in open and closed parishes also demonstrate how dependent the lower classes were on the philanthropy and attitudes of landowners to improvement. This is illustrated by the statistics in Section 4.4.2, which found that 40.9% of the sample sites were in closed parishes, 39.8% in intermediate and only 19.3% in open. The landowners in closed parishes controlled many aspects of the inhabitants lives including housing provision and access to places of worship as well as water supply. The improvements in water supply may have been one of the means they employed to retain good workers. Documentary sources record landowners including pumps or wells in their plans for estate housing (WO192, CH185) and several examples were identified of local gentry providing funding for a feature in their villages (SO190, VW068, VW119), as described in Chapter 5. Provision of water was generally better in closed than open parishes and was better generally in areas where a particular individual took responsibility.

Many of the communal pumps and wells were erected in a central location, such as village greens (CH050, SO163) or at the centre of a crescent of new houses (CH165). Water collection would have been a major chore, but also an opportunity to socialise.

In urban areas the provision of water was historically more complex than in rural areas and improvements were instigated sooner. The density of population in towns placed a strain on the infrastructure, particularly with respect to waste disposal, contributing to the large-scale water-borne epidemics of the mid 19th century such as cholera, which in Oxford prompted construction of a new waterworks in Lake Street (OX019) in 1854.

When detailed studies of different types of housing (Barley 1961, Burnett 1978) are considered the contrasts are even more marked. In the 19th century evangelical Christians

and social reformers began working to improve working class housing, such as the Christ Church tenements (OX099, OX100) in Oxford, and the Temperance Movement influenced the foundation of the Drinking Fountain Association (CH025) and Temperance Hotels (CH128, OX125). Houses also reflected changes in attitudes to water usage and cleanliness which accompanied the improvements in supply. In country houses many preferred the attentions of servants in private rooms to their being observed on the way to shared bathrooms for example (Girouard 1978). Baths, usually portable, in working class homes were first installed in kitchens close to ranges where water could be heated. Associations with smells and dirt meant that early WCs were accessed from outside the house. Now all houses include discreet indoor provision and a daily shower is increasingly the norm. Access to a plentiful water supply was better in urban than rural areas.

Improvements to WCs encouraged their adoption, but again the change was more rapid in urban than rural areas and for the higher social classes. These variations emerge clearly from studies of house plans (Hinchcliffe 1992, Paine 1978), which also illustrate how attitudes to WCs and bathing have changed. Initially doubts about smell and cleanliness meant it was not acceptable to have the WC inside the house. Baths moved from portable to built-in and from kitchens and sculleries to purpose built bathrooms, accompanied by changes in expectations over bathing frequency.

The study has also attempted to identify the provider of features. In towns this was frequently the local authority, from parish pumps (OX002) to the waterworks (SO018). Until the 20th century private individuals (SO191) and landowners (WO192) were the main providers in rural areas. In several cases it appears that the philanthropy of the donor may have masked other motives, such as seeking political support, establishing a sense of obligation or retaining key workers.

Better water supplies also led to increases in the use of water for leisure. Although Oxfordshire's rivers were already used for swimming, municipal authorities and private individuals began to construct pools.

8.2.3 Implications for legislation and protection

Only five water supply features within Oxfordshire are Scheduled Monuments, and of these only two are independent features, the Carfax Conduit (SO025) and the North Hinksey Conduit House (VW020), the others lying within castles or a historic house. They were all scheduled between 1950 and 1962. The number of Listed Buildings in Oxfordshire linked to water is 98, unevenly distributed across the county, ranging from eight in Cherwell to 32 in South Oxfordshire. The existing designation criteria are robust and changes would not be appropriate.

As discussed in Chapter 2, the criteria for designation, with their focus on nationally important sites, are difficult to use for water features. The listing selection guide on Street Furniture published in 2011, which covers pumps and drinking fountains, states that 'Post-1840 structures that were mass produced and survive in very large numbers are unlikely to warrant designation' (EH 2011b, 2). Most water features would only be deemed of local importance and are unlikely to benefit from the protection of designation.

It is not always clear why there is an uneven distribution of Listed Buildings across the county or why one feature was selected rather than another, for example the Wilder's of Wallingford well Wood Lane, Kidmore End (SO009) is Listed, while the apparently identical well and roof on Gallowstree Common Road, Sonning Common (SO008) is not. A review of features might be beneficial, perhaps giving more consideration to group

value and historical associations, for example the two wells in Islip parish both funded by a wealthy Indian family, but only one Listed.

In the 2011 Heritage at Risk report, only one of Oxfordshire's Scheduled and Listed water features was included: the Grade II Well House at Wick Farm, Barton (SO042). Nationally there were three Scheduled Monuments and 28 Listed Buildings with a specific relationship with water supply in the list (EH 2012g). This suggests that once water features have achieved designation they are maintained.

The current pressure towards local listing may help to address the low level of recognition of water features, although such designation does not bring into force any specific restrictions on their removal (EH 2012i, 7). A major strength of the local listing process is the involvement of the community in nominating features for inclusion, as surviving elements of water supply are more likely to be valued locally.

Pressure on local government funded services has resulted in reduced staffing levels in the historic environment field. The scope for undertaking projects to enhance the records in the field of water supply will be very limited and the current under-recording seems likely to continue. At present less than 30% of the sites identified appear on the national and county heritage lists. The CBA is working with HERs to develop a toolkit to help groups and individuals to add sites to their local record (Heyworth 2013, 63). Initially targeted on structures surviving from World War I, this scheme might be adapted for water features.

8.2.4 Attitudes to water

Finally, the thesis aimed to explore the current attitudes to water supply of a range of stakeholders.

The results of field research, analysed in Chapter 4, and the cases studies in Chapter 7 show that the condition of features depends on who has responsibility for them. When the condition of surviving features was compared 16.1% of sites in private ownership and 10.8% under local authority control scored the highest Grade 1. The figures for Grade 2 were 23.6% and 13.7% respectively, but for Grade 5 they were 20.0 % and 32.3%, reversing the pattern. Private owners are more closely connected to the feature and more likely to carry out maintenance. The difference in scores was very marked for sites controlled by the national/regional bodies with 51.6% at Grade 1 and 9.7% at Grade 5, reflecting the number of reservoirs etc. which still form part of the supply network and are thus regularly maintained. Survival of water supply features is dependent on some person or organisation taking 'ownership'.

This 'ownership' is demonstrated by conservation projects such as the Oxford Preservation Trust and the St Clements drinking fountain (OX005). Where a feature is ignored, it is vulnerable and likely to be removed. The poor level of preservation of many of the wayside taps in Cherwell, reduced to a short length of sealed off pipe, exemplifies this, although this District is the only one with a significant number of such taps, 53.1% of the total.

Differences in attitudes to water supply can also be seen in the level of survival of features. Elaborate memorials such as the Churchill Fountain (WO017) tend to be better preserved, possibly because they are more likely to be protected as Listed Buildings.

The aesthetic quality of water is clearly illustrated by its continuing importance in garden designs. Examples from Oxfordshire span the entire period of this study, from the 16th-century moats at Beckley (SO140) to Jellicoe's work at Ditchley (WO159), with Blenheim Palace (WO160) the outstanding example. Ornamental fountains are also found in public settings, such as the former Radcliffe Infirmary (OX021). Many of the ornamental features have been erected as memorials, for example the Phillimore Fountain (SO014), combining aesthetic and religious aspects of water. Interestingly, Oxford has no water features as war memorials.

The use of photographic evidence and personal recollections have proved of particular benefit for studying issues such as gender, while anthropological studies also make a significant contribution. Water supply has traditionally had a strong influence on the everyday life of women and children. In the chalk areas of South Oxfordshire collecting water from some distance was generally their responsibility (Preece 2000-1), although there are photographs showing men at wells (Plate 7.4b). Having ready access to water would have reduced the labour of washing and cooking. Water collection was traditionally a job for women and children, and continues to be so in developing countries (Coles 2005).

Given global population increases and climate change, issues relating to water supply will become increasingly important. Among the threats of climate change is a reduction in access for millions of people, possibly leading to conflict. Even now, in some parts of the world water shortage and contamination are responsible for extreme hardship and many deaths, not just during periods of drought or natural catastrophe. In the developed world plentiful, pure water and efficient removal of sewage are taken for granted. Each year individual consumption figures rise and a temporary ban on the use of hosepipes or similar control measures causes public outcry, possibly reflecting the lack of

accountability, particularly at local level, of centralised providers such as Thames Water. Approaches to water supply in the past may help in addressing problems with maintaining the current level of availability of this vital resource.

8.3 The Contribution of Archaeology

8.3.1 Recording and Interpretation

For the post-medieval and modern periods archaeology is far from the only source of information available to inform understanding of how people lived in the past. However, archaeology, both through standing remains and archaeological catalogues, can offer information not recorded elsewhere or offering a unique perspective, complementing other sources.

A problem with all sources is their selectivity. Information from maps only provides a snapshot of what was present and recorded at a particular date. The reliability of recording of smaller features such as pumps and wells in part depends on the scale of the map. Fieldwork shows that features marked on modern maps may not still exist (SO021) and that the mapping is far from complete. Inspection in the field is the only accurate way to determine survival of early features and to assess the extent of that survival.

Researchers only include what they deem of interest or relevant. As discussed in Chapter 2, water supply is not well represented in studies of the country house. Where local histories do talk about water supply, precise locations are seldom mentioned and details such as manufacturer, ownership and responsibility etc. are not included. Secondary sources which provide syntheses on topics like public health select their data to support a particular argument.

It will never be the case that every piece of information is preserved, even given the ever-expanding potential of electronic resources. However, the difficulty in tracing archives for the numerous water companies in Oxfordshire which were later absorbed into Thames Water shows how easily complete sets of records can be lost.

The archaeological evidence surveyed by this thesis falls into two parts: archaeological remains, above and below ground, and the excavated evidence and documentation. The evolution of various cataloguing systems for archaeology was discussed in detail in Chapter 2. Their availability allows researchers to discover what water supply features have been recorded in any locality and carry out comparisons with other areas. These catalogues are by no means complete, as the analysis in Chapter 4 shows.

When archaeological recording and excavation are carried out, the underlying principles employed require a systematic approach leading to the final deposition of physical remains and documentary records to an archive. The rationale is that the primary evidence can be accessed and used in the future to answer new research questions or when new analytical techniques emerge. Although reality often falls short of this ideal, the potential to reassess the evidence is a particular strength of archaeology.

In situ remains have a particular contribution to make to the study of water supply. The presence of a group of features within a particular area allows patterns to be identified, several of which have been explored in this study. Use of a particular manufacturer's products is immediately obvious in the field for example, but it would take a considerable amount of documentary research to identify it.

The presence of an old water feature raises many questions, starting from the simple,

such as its date, to more complex issues about its relationship to the society it served, which, as discussed in Chapter One, have formed the basis for this study. It is unlikely that mere reference to a pump in a documentary source or even a photograph will generate the same interest or as many questions, some of which can be answered through closer examination of the feature, although more often answers require other available information sources to be consulted.

Seeing surviving features in their original location, even where the context of their surroundings has changed, stimulates the imagination in ways that documentary sources or photographs seldom can. The imaginative stimulus that accompanies direct observation applies to researchers no less than the general public. Richard Morris, when Director of the CBA wrote '*What greater stimulus to the imagination, than to contemplate a place of sepulchre 3,500 years old in the cold fog and gloom of November?'* (Morris 1998).

As Chapter 7 demonstrates, old water supplies arouse considerable interest and commitment from local people once they are made aware of their presence and helped to explore their significance. In recent years more and more people have become interested in exploring their identity and investigating their ancestors. For older generations the sight of these water features can stimulate reminiscences about their youth and family.

8.3.2 Theory and significance

The structure of this thesis allows a focus on the different theoretical traditions in archaeology, discussed in Chapter 2. The establishment of the database of features created an assemblage within which recurring patterns could be identified. The significance of sites was first assessed in relation to their function as a water supply and what they could contribute to the history of water technology and access to water for

different groups in society. At this stage water features were considered from a processual perspective. Only the Henley Waterworks (SO088), the first to adopt the Atkins preservation system, has any individual significance, but collectively the sites make an important contribution to understanding of how water supply operated.

In order to address the complexities of relationships between groups in society it was necessary to proceed in a post-processual way, allowing validity to different attitudes and interpretations. Landowners' motives for providing facilities for their tenants, and those underlying the philanthropic movements of the 19th century are not straightforward. Features were also selected for discussion based on the significance of their aesthetic qualities, at Blenheim Park (WO160) for example and their associations with particular individuals such as Sir Henry Acland (OX019) or the Maharajah of Benares (SO010).

Both these theoretical approaches have merit, but also weaknesses in relation to water supply and neither provides a satisfactory assessment of its complexity. Processual theory will relate to the impact of the development of water supply on broad social groups, such as the development of steam powered water pumping stations, but does not consider the way that individuals interact with and influence the world around them in the way that post-processual theory does. The latter seeks to interpret elements such as design and distribution of features, for example the symbolism of landscaped parks and their water gardens. The significance of water features to the communities they served arose from a mixture of the functional provision of an essential element of life and the attitudes and obligations of both users and suppliers. The broader theoretical approaches of material culture studies and historical archaeology are more suitable for this (Cochran & Beaudry 2006, 192-4).

The research was underpinned throughout by historical archaeology, with its combination

of field evidence and documentary sources and the focus on everyday activities and those often absent from documentary records. The materiality of the surviving archaeological features has generated themes for analysis, with the statistics produced in Chapter 4 further developed in Chapters 5-7, and documentary references to lost ones has assisted in creating a statistically viable sample. The picture of society obtained from the documents provides a good starting point, but when different sources are put alongside the field evidence a more complex picture emerges. Lack of interaction between different specialisms stifles the development of new approaches to the topic and does not reflect the role of water supply and its assets within the society that employed them.

Many of the characteristics of historical archaeology identified by Deetz underlie this thesis. It looked at the cultural remains of literate societies and particularly material objects which survive above ground and also made use of archaeological informants and of photography (Deetz 1997, 5-9). Although large-scale water enterprises were considered, many of the remains were everyday features such as pumps used by ordinary people. The study is using material culture to look at aspects of society which are seldom mentioned, one of the important elements of historical archaeology (Deetz 1997, 11; Hicks & Beaudry 2006, 194).

Researchers are selective and include what they deem to be important. Theorists have tended to focus on aesthetics, politics and society rather than the functional and pragmatic aspects of life and, as a result, water supply has been largely overlooked. The multi-disciplinary approach and the emphasis on 'small things' and under-represented sections of society of historical archaeology provide opportunities to redress this imbalance.

8.4 Further Research Agenda

This thesis has demonstrated the survival of *in situ* historic water features, which can provide a basis for explorations of technology and social history. A number of areas for future research have emerged from the results

8.4.1 Expansion of the database

Many more water features existed than have been identified to date, and a significant number must survive *in situ*. More of these need to be added to the database, particularly in areas where no evidence for the historic water supply has been recorded in a parish.

Within the county the intensity of fieldwork has varied across the districts. The most exhaustive survey was carried out across Cherwell District, although this focused on the settlements not isolated rural areas. The author lives in South Oxfordshire and was thus more familiar with that district and its resources. Oxford City is geographically a small urban area, which has been extensively studied, and where it was relatively easy to identify surviving water supply features.

The available documentary sources likewise show a variation in the depth of coverage. Those parts of South Oxfordshire and the Vale of the White Horse Districts which were transferred to Oxfordshire from Berkshire in 1974 are included by the Victoria County History in the latter county. The Berkshire volumes were published in the early 20th century, when the scope was largely confined to manorial and church history. Although the VCH coverage of pre-1974 Oxfordshire is not yet complete, the published volumes are more recent and usually include some indication of how water and drainage were managed. A wider range of documentary sources remains to be explored.

8.4.2 Classification of parishes in the area transferred in 1974

The study classifying open and closed parishes did not cover the whole county (Byung Khun Song 2002, 209). Production of a similar classification of the former Berkshire for which a simplified designation had employed, would be beneficial to provide a firmer basis for comparisons. The 2002 results could also be reconsidered, to identify any conflicts with evidence from other sources.

8.4.3 Extension to other counties

The research carried out in Oxfordshire for this thesis does not appear to have been carried out for other parts of the country, although some work has been done on the broad relationship between settlement patterns and distributions of wells and springs in Worcestershire (Noke 2013). Similar databases for other counties would provide the opportunity to test whether the patterns in provision identified for Oxfordshire are valid and whether they are replicated elsewhere.

Oxfordshire is not necessarily representative of the national picture, as for example it does not have many large towns and even Oxford is a relatively small city by national standards. Oxfordshire is situated in central England with no extremes of topography or climate, although compared to many areas the geology is quite varied. Similar studies are needed elsewhere, with which the conclusions for Oxfordshire can be compared. As well as physical differences, differences in social structures and levels of industry should be considered.

8.4.4 Manufacturers

An extensive catalogue of manufacturers of water features, their designs and any identification symbols used needs to be drawn up. This would contribute to the history of

water technology and of the manufacturers themselves as well as allowing patterns of distribution and their causes to be further explored, including approaches to marketing and advertising.

The ability to identify the manufacturer of a particular feature is currently limited, although several groups are recording the existence of pumps across the UK. However, few carry a maker's mark and systematic research into documentary sources or comparative studies have not yet been carried out.

8.4.5 Providers, motivations and access

More needs to be done to record the providers of water features and to explore funding sources and any associated restrictions on access. This thesis has found considerable variety in who was responsible for installing water features and has suggested possible motives for their actions, which link to wider social themes, as discussed in Sections 5.5 and 7.3 for example.

8.4.6 Specific local case studies

Many opportunities exist for detailed studies of a specific aspect of water supply, for example provision within the estates of a particular landowner, similar to that for the Wantage estates at Lockinge and Ardington (see Section 5.4.3). Further evidence for association with trends such as the temperance movement, such as the provision of temperance hotels and the work of the Drinking Fountain Association (see Section 6.4), might also be explored.

8.4.7 Comparison with mainland Europe

It would appear from the author's experience in other countries, discussed in Section 7.1.7, that early water features have continued to be used to a far greater extent than is the case in the UK, where restoration does not often result in their re-use, as illustrated by the St Clements fountain (OX005) (see Section 7.1.2). These countries all have good, modern mains supply systems and similar legislative regimes to the UK (WHO 2010). If statistics can be obtained confirming the difference in continuity of use, the reasons for it would merit further investigation.

8.4.8 Oral histories

Recording of oral histories and other personal recollections should be a priority. For over 30 years the Oral History Society has been encouraging the recording of the contribution to historical studies of ordinary people (http://www.ohs.org.uk/about_ohs.php).

A full understanding of life in the past should include how people felt about their circumstances and their positions in society, the sort of stories published by Mayhew and more recently by the Fellowship of Women's Institutes (OFWI 1999). There remain limited opportunities to record first-hand evidence for what life was like before the arrival of universal piped water. It will be challenging for younger people to realise how recently this occurred and how rapidly change can happen. An example of rapid change within a single lifetime, which would be suitable for an oral history record, is the author's own memories of visiting her grandparents in a Cornish town in the 1950s and 60s. They brought up six children in a house with a single cold tap and sink in the kitchen and retired to a smaller house with the same arrangement. Both had an outside WC, the one at the second house in a converted cellar accessed via a passage off the street. On a visit to an elderly cousin's farm in 1958, the earth closet in its shed had to be used.

8.4.9 Raising awareness

Opportunities to disseminate information about water supply in the past and to engage with a range of stakeholders need to be identified and acted upon. While the author can circulate this thesis, publish papers and deliver lectures, action from the wider heritage sector is required.

The survival of *in situ* water features, better representation in catalogues and documentary sources and a more central place in research and publication will depend on increasing awareness of the existence of assets and their potential value, and this relies on a sense of ownership.

Many societies exist for those with an interest in vernacular features, for example The Milestones Society, which maintains a database (www.milestonesociety.co.uk). For water, only The British Water Tower Appreciation Society (http://bwtas.blogspot.com) has been identified, although some individuals maintain websites (www.villagepumps.org.uk).

Dissemination must go outside the historic environment community, including a contribution to education of children and of adults, for instance through lectures. The new National Curriculum for England, which comes into force in September 2014, provides opportunities at key Stages 2and 3, where History is expected to involve a local study and Science looks as mechanisms as well as the water cycle (DfE 2013a, 2013b).

Local groups, such as the Greenmoor Conservation Group, can be involved. This group has followed the route promoted by Archaeology Scotland's 'Adopt-a-Monument' Scheme (www.archaeologyscotland.org.uk).

8.5 Outcomes

The foundations of a comprehensive catalogue of water features in Oxfordshire has been established, with 910 entries to date. This is the first such undertaking for this county, probably for any county in the UK. Patterns emerging from the analysis of the data have been developed to demonstrate the capacity of water supply to inform understanding of how society operated in the past, particularly at local level. Using the features as the starting point for research represents a fresh approach whereas it has been usual for the theme to be established with elements of water supply selected for illustration.

The study exemplifies social archaeology and shows the tremendous amount of information about communities which is embodied in overlooked, broken and missing components of water systems. Archaeology makes a vital contribution to our understanding.

The maintenance of this class of architectural feature is important and, as demonstrated in this thesis, if no-one feels any sense of ownership then survival is uncertain. Without increased awareness of the existence and significance of these features, there is a danger that a valuable resource for understanding of past societies will be lost.

The Historical Archaeology of Post-medieval Water Supply in Oxfordshire

Volume II: Bibliography, Plates, Appendices

Thesis submitted for the degree of Doctor of Philosophy

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Hilary 2014

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a) WO130: Spring, Gagingwell



b) VW029: Sunningwell Pond



c) CH002: Manor Farm, Noke



d) CH008: Newton Purcell

Plate 3.1



a) SO006: Donkey Wheel, Greys Court



b) VW001: Abingdon Conduit House



c) BE001: St Anne's Well, Caversham



d) WO006: Bushell's Waterworks, Enstone (Plot)

Plate 3.2



a) SO012: Wilder Well & Clip, Ipsden



b) CH025: Drinking Trough, Banbury



c) CH165: Council House Well, Kidlington (OCC - Oxfordshire History Centre)



d) VW030: Farmoor Reservoir

Plate 3.3



a)WO023: Dunstable Safety Elevator Co



b) WO015: Evans



c) VW014: Glenfield & Kennedy



d) VW022: Godwin

Plate 4.1



a) WO010: H AM Baker



b) WO104: Hemming



c) SO050: Jiangyang



d) CH152: Lee Howl

Plate 4.2



a) SO011: Mac Farlane

b)VW021: Owen





c) VW072: Proteus

d) CH009: Roberts



Plate 4.3



a) SO 117: Sigma Group



b) VW052: Warner

c) VW024: Whatley



d) SO0008: Wilder



Plate 4.4



a)

WO017: Gothic



b)WO058: Gothic



c) WO016: Baroque



d) OX013: Baroque

Plate 4.5



a) WO018: Arts and Crafts –



b) SO056: Arts and Crafts



c) SO078: Indian Influence



d) BU003: Egyptian Influence

Plate 4.6



a) CH063: Tite, Hook Norton



b) CH009: Pump, Finmere



c) SO092: Water Tower Nuneham Courtenay

d) CH185: Pump, Mixbury



Plate 5.1



a) VW013: Ashbury Ram Pump



b) CH006: Hydraulic Ram,

Great Bourton



c) SO001: Water Tower,

Woodeaton Manor



d) CH043: Water Tower,

Trow Pool

Plate 5.2



a) SO013: Well, Shiplake Row



b)SO119: Well, Whitchurch Hill



c) SO100: Well, Gallowstree Conmmon



d) WO002: Trough, Fordwells

Plate 5.3



a) WO006: Rosamund's Well, Blenheim Park



b) WO005: Grand Bridge, Blenheim Park



c) WO007: Reservoir, Blenheim Park



d) VW025: Tap, Buscot

Plate 5.4



a) WO056: Cold Bath, Rousham Park



b) CH092: Horsewell, Middle Aston



c) WO038: Ledwell



d) CH085: Eoppa's Well, Epwell

Plate 5.5



a) VW017: Badwell, Appleton



b) OX007: St Margaret's Well, Binsey



c) WO043: Ladywell, Wilcote

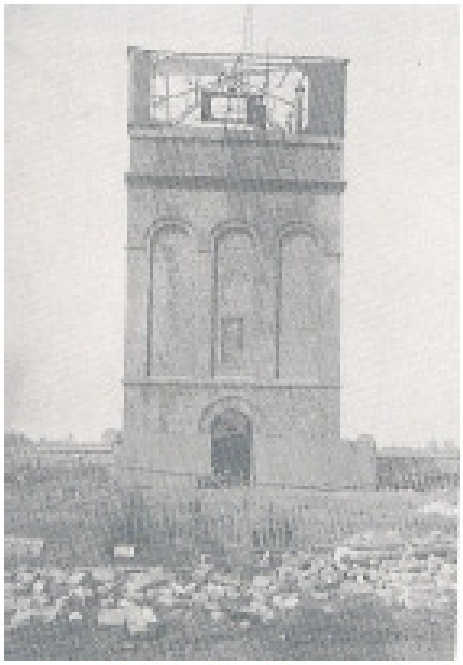
Plate 5.6



a) VW055: Abingdon Town Hall –



b) SO094: Wallingford Water Tower



c) WO062Witney Water Tower

(Worley 1981)



d) Henley Waterworks – SO088

Plate 6.1



a) VW006: Wantage Waterworks

b) SO128: Woodcote Reservoir



c)LO008: Bazalgette Monument



d) SO148: Thame Drinking Trough



Plate 6.2



a) CH016: North Aston Drinking Fountain



b) OX125: Dodson's Temperance Hotel



c) OX099: Christ Church Old Buildings



d) OX071: Tumbling Bay

Plate 6.3

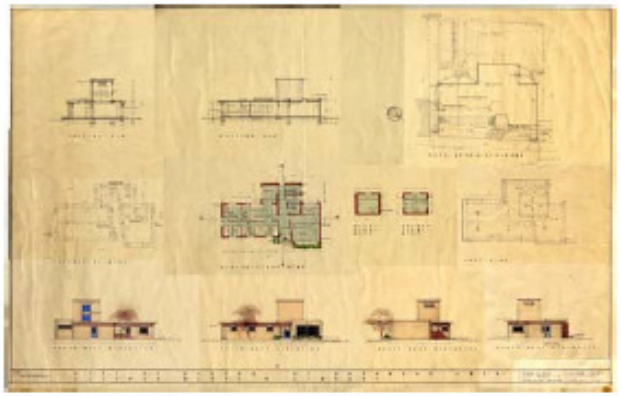


a) OX088: St Clements Baths

(Whittock 1830)



b) CH128: Banbury Temperance Hotel



c) OX084: St Barnabas Baths Plan

(OCC – Oxfordshire History Centre



d) OX049: St Edmund Hall Well

Plate 6.4



a) OX011: Oxford Castle Wellhouse

(Oxford Archaeology)



b) VW020: North Hinksey Conduit



c) SO025: Carfax Conduit



d) OX019: Lake Street Waterworks

Plate 6.5



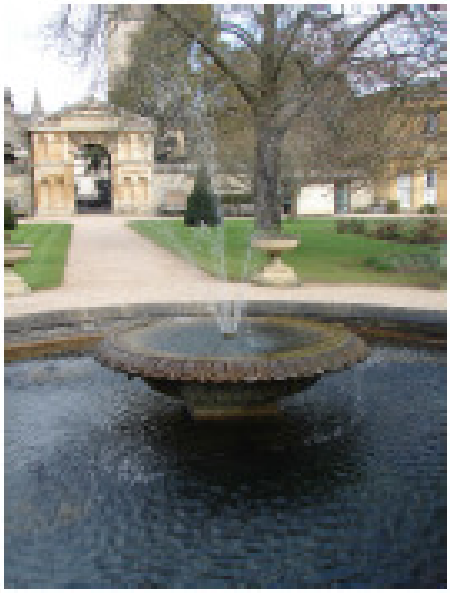
a) OX002: St Mary's Parish Pump



b) OX080: Rosehill Cemetery



c) OX001: Carfax Tower



d) OX006: Botanic Garden

Plate 6.6



a) SO146: 42 Upper High St, Thame



b) SO018: Thame Waterworks



c) SO052: Whitehound Pond, Thame



d) SO143: Thame Market House

Plate 6.7



a) OX028: Oxford University Press



b) CH233: RAF Upper Heyford

c) WO090: Cornbury US Camp

(Oxford Archaeology)





d) SO164: Fairmile Hospital

Plate 6.8



a) SO162: Didcot, Station Water Tank

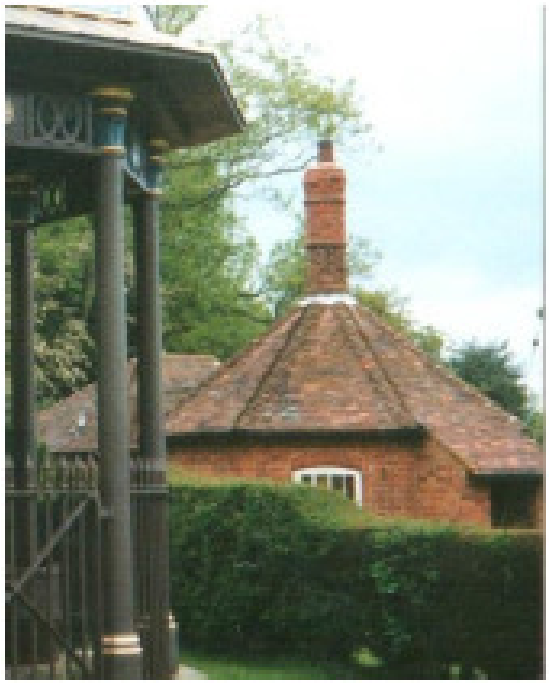
b) CH004: Clattercote, Canal Reservoir



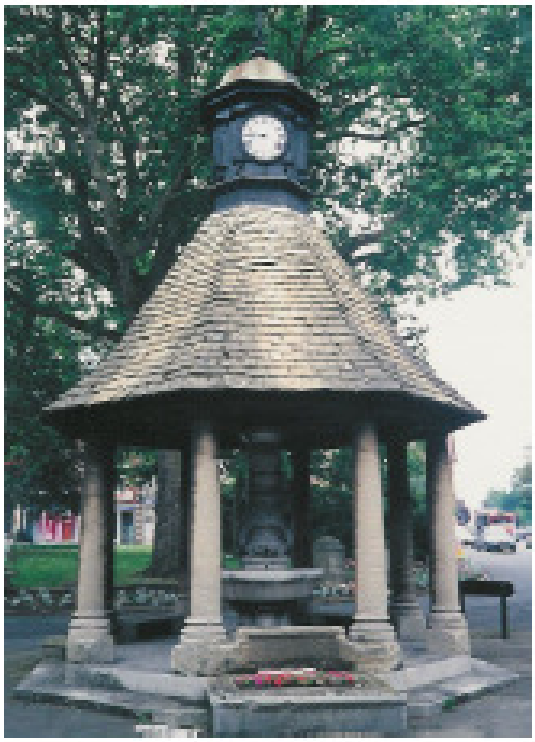
Plate 6.9



a) SO010: Maharajah's Well



b) Well Keeper's Cottage, Stoke Row



c) OX005: St Clement's Fountian

d) SO042: Wick Farm Well House

(Courtesy Julian Munby)



Plate 7.1





a) SO127: Greenmoor Pond;

b) SO129: Greenmoor Well





c) SO121: Whitchurch Hill Charges

d) and e) SO051: Little Milton Allotment Pump and Well



Plate 7.2



a) 801: Berlin, Germany



b) 803: Mullenbach, Germany



c) 831: Garaioa, Spain

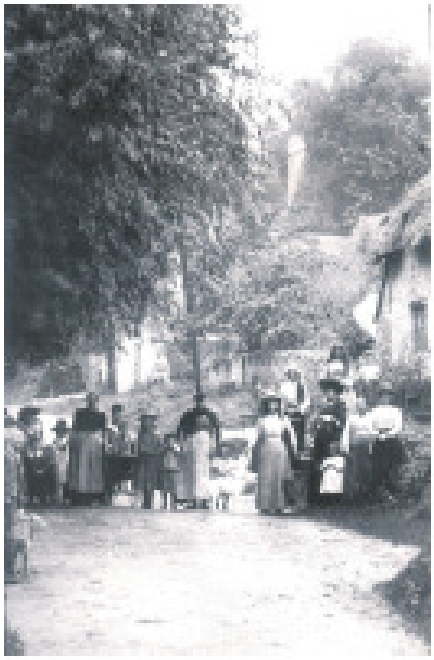
d) 814: St Antheme, France (non potable)





e) 813: St Antheme, France (potable)

Plate 7.3



a) Women in Beckley collecting water (Wheeler 1999)



b) Mixed sex collectors in Stoke Row (Spencer-Harper 1999)



c) WO138: Bath House (©Michael Dibbs, Creative Commons)



d) SO103: Woodperry Water Tower

Plate 7.4



a) WO053: Blenheim Palace – Bernini Fountain



b) OX130: 60 Banbury Road, Oxford



c) CH250: Grimsbury, Banbury



d) CH182: South Newington Council Houses

Plate 7.5



a) WO001: Kibble Fountain, Charlbury

b) WO019: Shipton-under-Wychwood



Plate 7.6

Appendix 1: Witney Water Tower Poems

The Bursting of the Tank

1 Water tower,
Tank on top.
Filled with water,
Went off pop.

2 Sudden strain,
Sides bent,
Consequently,
Big rent.

3 Losing water,
Quite a crock,
To the Council,
Quite a shock.

4 Great sensation,
Council run,
And people too,
To see the fun(?)

5 Poor little lamb,
With names below,
So proudly raised,
Dishonoured so.

6 It's not our fault,
Perhaps they'll say,
But who will have,
To *pay, pay, pay*?

Witney Gazette 27th Feb 1904

“Hinc IllæLachrymæ”

1 Rejected, scorned,
Poor old Tank;
Piece by piece to earth
It sank! R.I.P.

2 Old girders gone –
The new arrive;
A better job to make
They strive’

3 A nice YOUNG Tank
Grows up each day;
Until at last it seems
To say –

4 “Oh, fill me up with
Water, more,” (Moore)
And in the stream begins
To pour.

5 Proudly it gleams with
Colour bright;
Its bright red paint
Dazzles sight.

6 Pride goes before a fall
They say,
And so it seemed to be
That day!

7 For all at once the side
Fell out!
Contents poured out like a
Water spout!

8 What fate is this that seems
To hang
About this Tower, makes Tanks
Go bang?

9 Is it to keep the names
On view?
Or keep their owners in
A stew?

10 Oh, poor old Tank! Poor
YOUNG one too!
Alas, that we should mourn
For you!

1905 Postcard

Appendix 2: Site Catalogues

The Catalogue lists in Appendix 2 provide a summary of the key information relating to sites. More detail, including images where possible, are given in the Database included as a CD. A sample record for each of the three groups of sites – Oxfordshire, Rest of UK, Europe – is included here for illustration. The database is compatible with Access™ 2007 or later versions.

For the Rest of UK, the catalogue only contains sites directly relevant to the text, and is not a complete list of all sites and features identified by the author.

Abbreviation used in Catalogue

Oxfordshire Districts

CH	Cherwell
OX	Oxford City
SO	South Oxfordshire
VW	Vale of White Horse
WO	West Oxfordshire

Category of Feature

A	Supply
B	Processing
C	Storage
D	Leisure/ornament
E	Health/cleanliness
F	Waste
G	Miscellaneous

UK County

BD	Bedfordshire
BE	Berkshire
BR	Bristol
BU	Buckinghamshire

CA	Cambridgeshire
CE	Cheshire
DE	Derbyshire
DV	Devon
ES	Essex
GG	Glasgow
GL	Gloucestershire
GW	Gwent
HE	Hertfordshire
IW	Isle of Wight
LI	Lincolnshire
LO	Greater London
ME	Merseyside
NN	Northamptonshire
NO	Norfolk
PO	Powys
SH	Shropshire
SM	Somerset
SU	Surrey
SX	Sussex
TY	Tyneside
WA	Warwickshire
WM	West Midlands
YO	Yorkshire

Figure A2.1: Database Record: Oxfordshire

Oxfordshire

Site Number:	CH001
District:	Cherwell
Parish:	Noke
Place:	Briggs Cottage, Noke
Feature Name:	
Feature Type:	Well
Site Category:	A
Easting:	454770
Northing:	212810
Date:	UN
Condition:	2
Ownership:	Private
Parish Type:	Closed
Geology:	Oxford Clay
Geology Category:	Clay
SM:	
LB:	
RPG:	
EHA:	
HER/UAD:	

Description:	Rectangular stone lined shaft with wooden surround, now covered with wooden lid. Water clear and within 0.5 m of top. Deeds to cottages in row contain right of access to the well. Occupant of Briggs Cottage remembers well in use post WW II, with some mechanism for drawing water, but no well house or similar.
Reference:	Simon Walton, house owner, pers. comm.
Image Source:	J Hind
Image:	

Figure A2.2: Database Record:Rest of UK

Rest of UK

Number:	BD001	Grid reference:	TL085613
County:	Bedfordshire	Date:	PM
District:	Bedford	Condition:	3
Parish:	Bolnhurst & Keysoe	Ownership:	Local Authority
Place:	Keysoe Row	Description:	Series of Glenfield & Kennedy lion head features along roads. Obviously part of village network.
Feature Name:		Image Source:	Google
Feature Type:	Pump	Image:	

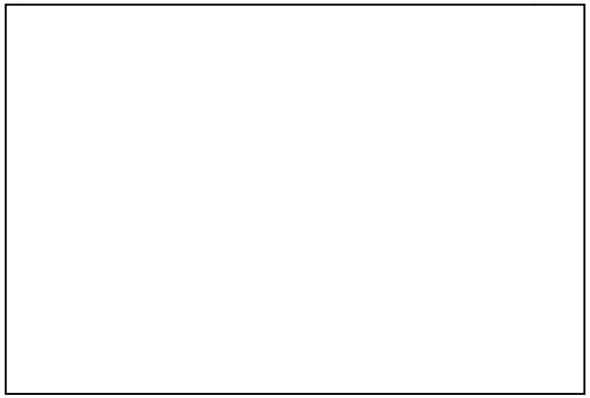


Figure A2.3: Database Record: Europe

Europe

Number:	801
Country:	Germany
Town/Village:	Berlin
Place:	Klausenerplatz
Feature Name:	
Feature Type:	Pump
Date:	c1900
Condition:	1
Description:	Large local water pump with dolphin decoration. Typical of city. Still supplying water. Not seen used but no reason why not.
Image source:	J Hind
Image:	

Catalogue of Sites in Cherwell District

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH001	Noke	Briggs Cottage, Noke		Well	A	UN	2	Private	Closed	Clay	UN	SP547128
CH002	Noke	Manor Farm, Noke	Manor Farm Well	Well	A	PRE	3	Private	Closed	Clay	UN	SP542134
CH003	Wardington	Upper Wardington	Granny Well	Well	A	C19	2	Private	Intermediate	Limestone	UN	SP493463
CH004	Claydon with Clattercote	Between Claydon and the A423	Clattercote Reservoir	Reservoir	C	C18	1	National/ Regional	Closed	Limestone	HER	SP453486
CH005	Bourton	StanWell Road, Great Bourton	Butter Well	Well	A	MED	4	Private	Intermediate	Limestone	UN	SP458457
CH006	Bourton	StanWell Road, Great Bourton		Pump	A	C19	2	Private	Intermediate	Limestone	UN	SP457456
CH007	Bourton	Swan Lane, Great Bourton		Tap	A	C19	5	Local Authority	Intermediate	Limestone	UN	SP458456
CH008	Newton Purcell with ShelsWell	A421, Newton Purcell		Well	A	PM	1	Local Authority	Closed	Limestone	HER	SP625305
CH009	Finmere	Valley Road, Finmere		Pump	A	C19	2	Local Authority	Closed	Limestone	UN	SP636328
CH010	Finmere	Mere Lane, Finmere		Pump	A	C19	3	Local Authority	Closed	Limestone	UN	SP637322
CH011	Adderbury	New Road, Adderbury	Pump House Garage	Pump House	A	C19	5	Private	Open	Limestone	HER	SP467349
CH012	Adderbury	Chapel Lane, Adderbury	Forester's Cottage	Well	A	UN	2	Private	Open	Limestone	UN	SP469353

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH013	Banbury	Horsefair, Banbury	Banbury Cross	Fountain	A	C19	5	Local Authority	Open	Limestone	UN	SP453404
CH014	Banbury	Holman Bridge, Banbury		Waterworks	B	C19	5	National/ Regional	Open	Limestone	HER	SP458417
CH015	Launton	Station Road, Launton		Pump	A	C19	2	Local Authority	Intermediate	Clay	UN	SP609225
CH016	North Aston	The Green, North Aston		Fountain	A	C19	2	Local Authority	Closed	Limestone	UN	SP477289
CH017	Souldern	High Street, Souldern		Pump	A	C19	2	Local Authority	Intermediate	Limestone	LB	SP520315
CH018	Souldern	High Street, Souldern		Spring	A	UN	1	Local Authority	Intermediate	Limestone	UN	SP522315
CH019	Deddington	The Chestnuts, Clifton		Tap	A	PM	5	Local Authority	Open	Limestone	UN	SP490318
CH020	Deddington	Clifton Road, Clifton		Tap	A	UN	5	Local Authority	Open	Limestone	UN	SP489318
CH021	Adderbury	Horn Hill Road, Adderbury		Well	A	C19	1	Local Authority	Open	Limestone	UN	SP466351
CH022	Bloxham	Little Bridge Road, Bloxham		Pump	A	C19	2	Private	Open	Limestone	UN	SP431373
CH023	Sibford Gower	Main Street, Sibford Gower		Well	A	C19	3	Local Authority	Intermediate	Limestone	LB	SP351378
CH024	Sibford Gower	Main Street, Sibford Gower		Pond	A	UN	3	Local Authority	Intermediate	Limestone	UN	SP351379
CH025	Banbury	Southam Road, Banbury		Trough	A	C19	3	Local Authority	Open	Limestone	UN	SP453409
CH026	Ardley	Water Lane, Ardley		Pump	A	C19	3	Local Authority	Closed	Limestone	UN	SP542275
CH027	FritWell	Heath Farm, FritWell	Wishing Well	Spring	A	MED	4	Private	Closed	Limestone	UN	SP524293
CH028	Bourton	Manor Road, Great Bourton		Well	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP457457

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH029	Wardington	Upper Wardington	Granny Well	Well	A	PM	2	Private	Intermediate	Limestone	UN	SP493463
CH030	Wardington	Upper Wardington	Granny Well	Well	A	PM	2	Private	Intermediate	Limestone	UN	SP493463
CH031	Chesterton	Chesterton village		Pump	A	C19	5	Local Authority	Closed	Limestone	UN	SP561212
CH032	Deddington	Deddington	Deddington Castle	Well	A	MED	4	National/ Regional	Open	Limestone	SM	SP471316
CH033	Banbury	Neithrop House		Well	A	RO	UN	Unknown	Open	Limestone	HER	SP439379
CH034	Tadmarton	Tadmarton	Holy Well	Well	A	MED	UN	Private	Intermediate	Limestone	NMR	SP393356
CH035	Sibford Gower	nr Bishop Blaize public House, Burdrop Gower	Holy Well	Well	A	MED	3	Local Authority	Intermediate	Limestone	NMR	SP357377
CH036	Newton Purcell with ShelsWell	Newton Purcell		Pump	A	PM	2	Local Authority	Closed	Limestone	HER	SP625308
CH037	Gosford & Water Eaton	parallel to A34 under hedge		Well	A	PM	UN	Local Authority	Closed	Clay	HER	SP496131
CH038	Drayton	E of Keepers Lodge, Wroxton Park		Pump House	A	PM	5	Private	Closed	Limestone	HER	SP425412
CH039	Ardley	W side of complex Ashgrove Farm		Pump House	A	PM	UN	Unknown	Closed	Limestone	HER	SP536226
CH040	Kidlington	Kidlington		Well	A	UN	UN	Private	Open	Limestone	HER	SP491151
CH041	Kidlington	Kidlington		Well	A	RO	UN	Unknown	Open	Clay	HER	SP498149
CH042	Middleton Stoney	Middleton Stoney		Well	A	PM	UN	Private	Closed	Limestone	HER	SP527233

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH043	Bucknell	Trowpool, Bucknell	Trowpool	Water Tower	C	PM	2	Private	Closed	Limestone	HER	SP549248
CH044	Drayton	Drayton		Bath	E	RO	UN	Private	Closed	Limestone	HER	SP429415
CH045	Hampton Gay and Poyle	Hampton Gay		Well	A	PM	UN	Private	Closed	Clay	HER	SP487165
CH046	Bicester	Bicester		Well	A	PM	UN	Private	Open	Limestone	HER	SP583224
CH047	Sibford Gower	E of Burdrop House, Burdrop		Pump	A	C19	UN	Private	Intermediate	Limestone	LB	SP359378
CH048	Shenington with Alkerton	Pump Cottage, Alkerton		Pump	A	C19	2	Local Authority	Intermediate	Limestone	LB	SP375428
CH049	North Newington	Banbury Road, North Newington		Pump	A	C19	3	Local Authority	Closed	Limestone	LB	SP420398
CH050	North Newington	Main Street, North Newington		Pump	A	C19	3	Local Authority	Closed	Limestone	LB	SP418399
CH051	Bloxham	High Street, Bloxham		Pump	A	C19	2	Local Authority	Open	Limestone	LB	SP430359
CH052	Bletchingdon	Bletchingdon Park, Bletchingdon		Pump House	A	C19	UN	Private	Closed	Limestone	LB	SP504181
CH053	Wigginton	Wigginton		Tap	A	PM	3	Private	Intermediate	Limestone	UN	SP388334
CH054	Hook Norton	Brick Hill		Spring	A	PM	4	Local Authority	Intermediate	Limestone	UN	SP357330
CH055	Wigginton	Wigginton		Pump	A	C19	3	Local Authority	Intermediate	Limestone	UN	SP387334
CH056	Stratton Audley			Water Tower	C	C20	2	Private	Closed	Limestone	HER	SP608264

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH057	Fringford	Church Close/Main Street		Pump	A	PM	4	Local Authority	Closed	Limestone	UN	SP607290
CH058	Hethe	Main Street		Pump	A	PM	2	Private	Closed	Limestone	UN	SP594294
CH059	Fringford	Pump Cottage, Rectory Lane		Pump	A	C19	2	Local Authority	Closed	Limestone	UN	SP604290
CH060	Deddington	Hempton		Tap	A	C20	2	Local Authority	Open	Limestone	UN	SP444318
CH061	Wigginton	Wigginton		Well	A	PM	2	Local Authority	Intermediate	Limestone	UN	SP390333
CH062	Shenington with Alkerton			Pump	A	PM	UN	National/ Regional	Intermediate	Limestone	HER	SP367426
CH063	Hook Norton	Hook Norton	Downend	Well	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP357332
CH064	Bicester	Howes Lane	Bicester Waterworks	Waterworks	B	C20	5	Local Authority	Open	Limestone	HER	SP571238
CH065	Fringford	The Green		Pond	A	UN	1	Private	Closed	Limestone	UN	SP603289
CH066	Hethe		St George's Spring	Spring	A	PM	1	Local Authority	Closed	Limestone	UN	SP594294
CH067	Hardwick with Tusmore			Pump	A	C19	2	Private	Closed	Limestone	UN	SP577297
CH068	Upper Heyford			Spring	A	C19	3	Local Authority	Intermediate	Limestone	UN	SP496260
CH069	Deddington	Deddington Castle St		Well	A	PM	2	Private	Open	Limestone	UN	SP469317
CH070	Banbury		Holy Well	Well	A	MED	5	Unknown	Open	Limestone	UN	SP456403
CH071	Banbury	High Street	Jacob's Well	Well	A	PM	5	Private	Open	Limestone	UN	SP455405
CH072	Banbury		St Stephen's Well	Well	A	PM	5	Unknown	Open	Limestone	UN	SP447403

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH073	Begbroke		St Begga's Well	Holy Well	A	PM	5	Unknown	Open	Limestone	UN	SP469143
CH074	Bicester		St Edburga's Well	Well	A	C13	5	Unknown	Open	Limestone	UN	SP575225
CH075	Bicester		Crock Well	Well	A	MED	5	Unknown	Open	Limestone	UN	SP582228
CH076	Bicester		Brockless Spring	Spring	A	PM	5	Local Authority	Open	Limestone	UN	SP577222
CH077	Bloxham		GodsWell	Well	A	PM	5	Unknown	Open	Limestone	UN	SP431357
CH078	Bloxham		Snap Dragon	Spring	A	PM	5	Unknown	Open	Limestone	UN	SP423367
CH079	Broughton		Chad's Well	Well	A	PM	5	Unknown	Closed	Limestone	UN	SP405390
CH080	Caversfield		Hawk's Well	Well	A	PM	5	Unknown	Closed	Limestone	UN	SP568245
CH081	Charlton-on-Otmoor		Healing Wells	Well	A	PM	UN	Unknown	Intermediate	Clay	UN	SP562157
CH082	Claydon with Clattercote		Perennial Spring	Spring	A	PM	5	Unknown	Closed	Limestone	UN	SP457500
CH083	Deddington		King's Spring	Spring	A	PM	5	Unknown	Open	Limestone	UN	SP466324
CH084	Duns Tew		BickWell Spring	Spring	A	PM	5	Unknown	Closed	Limestone	UN	SP458285
CH085	EpWell		Eoppa's Well	Well	A	PM	1	Local Authority	Intermediate	Limestone	UN	SP354403
CH086	HanWell		Perennial Spring	Spring	A	MED	UN	Unknown	Closed	Limestone	UN	SP438435
CH087	Hook Norton		Robber's Well	Holy Well	A	MED	5	Unknown	Intermediate	Limestone	UN	SP354331
CH088	Horley		Yellow Well	Holy Well	A	PM	5	Unknown	Intermediate	Limestone	UN	SP416445
CH089	Islip		Holy Well	Holy Well	A	RO	UN	Private	Intermediate	Clay	UN	SP536127
CH090	Kirtlington		Dunsbey's Spring	Spring	A	PM	UN	Unknown	Closed	Limestone	UN	SP518192

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH091	Kirtlington		Dashwood's Pond	Pond	A	UN	5	Unknown	Closed	Limestone	UN	SP500199
CH092	Middle Aston		Horse Well	Holy Well	A	PM	1	Local Authority	Closed	Limestone	UN	SP472270
CH093	Noke		Healing Well	Holy Well	A	MED	5	Unknown	Closed	Clay	UN	SP542131
CH094	Oddington		Healing Wells	Holy Well	A	PM	5	Unknown	Intermediate	Clay	UN	SP554149
CH095	Piddington		MusWell Spring	Spring	A	MED	5	Unknown	Intermediate	Clay	UN	SP644154
CH096	Piddington		Cow Close Spring	Spring	A	UN	UN	Unknown	Intermediate	Clay	UN	SP644162
CH097	Shenington with Alkerton	Shenington	KinWell Spring	Spring	A	PM	5	Unknown	Intermediate	Limestone	UN	SP366443
CH098	Sibford Gower		Cain's Well	Spring	A	UN	5	Local Authority	Intermediate	Limestone	UN	SP366397
CH099	Steeple Aston		Duckworth's Well	Holy Well	A	PM	5	Unknown	Open	Limestone	UN	SP480257
CH100	Stoke Lyne		Old Oak Well	Holy Well	A	PM	5	Local Authority	Closed	Limestone	UN	SP568287
CH101	Swalcliffe		Stour Well	Holy Well	A	PM	UN	Unknown	Intermediate	Limestone	UN	SP378363
CH102	Wigginton		Holy Well	Holy Well	A	PM	UN	Unknown	Intermediate	Limestone	UN	SP385233
CH103	Banbury	Neithrop		Water Tower	C	C20	1	National/ Regional	Open	Limestone	UN	SP439400
CH104	Bicester	Bignell Park		Water Tower	C	PM	2	Private	Open	Limestone	UN	SP552222
CH105	Bicester	Bicester		Water Tower	C	C20	1	National/ Regional	Open	Limestone	UN	SP591245
CH106	Bletchingdon			Water Tower	C	PM	UN	Unknown	Closed	Limestone	UN	SP503180
CH107	Cottisford			Water Tower	C	C20	5	Local Authority	Closed	Limestone	UN	SP592313

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH108	Hardwick with Tusmore	Pimlico Farm		Water Tower	C	PM	UN	Unknown	Closed	Limestone	UN	SP557314
CH109	Hethe			Water Tower	C	PM	5	Local Authority	Closed	Limestone	UN	SP595297
CH110	Shenington with Alkerton	Shenington		Water Tower	C	PM	5	Local Authority	Intermediate	Limestone	UN	SP357431
CH111	Shipton-on-CherWell and Thrupp	Bunkers Hill		Water Tower	C	C20	UN	Private	Closed	Limestone	UN	SP482174
CH112	Souldern	BoveWell		Water Tower	C	PM	UN	Private	Intermediate	Limestone	UN	SP515315
CH113	Stoke Lyne	Tusmore Park Farm		Water Tower	C	PM	3	Unknown	Closed	Limestone	UN	SP555303
CH114	Upper Heyford			Water Tower	C	C20	1	National/ Regional	Intermediate	Limestone	UN	SP513259
CH115	Noke	B4027	Noke Reservoir	Reservoir	C	C20	1	National/ Regional	Closed	Clay	UN	SP538128
CH116	Noke			Pond	A	UN	1	Private	Closed	Clay	UN	SP548129
CH117	Drayton			Pump House	A	PM	5	Local Authority	Closed	Limestone	HER	SP425412
CH118	Sibford Ferris			Well	A	PM	5	Private	Intermediate	Limestone	HER	SP357374
CH119	Bucknell	Trowpool		Pump	A	C20	UN	Local Authority	Closed	Limestone	HER	SP548248
CH120	Shenington with Alkerton	Shenington		Trough	A	PM	2	Local Authority	Intermediate	Limestone	UN	SP372428
CH121	Shenington with Alkerton	Shenington		Trough	A	PM	2	Private	Intermediate	Limestone	UN	SP372428

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH122	Hook Norton	Southrop		Well	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP358328
CH123	Shenington with Alkerton	Shenington		Pump	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP370427
CH124	Shenington with Alkerton	Shenington		Pump	A	PM	3	Private	Intermediate	Limestone	UN	SP372427
CH125	Shenington with Alkerton	Shenington	Dairy Well	Well	A	PM	2	Private	Intermediate	Limestone	UN	SP371429
CH126	Shenington with Alkerton	Alkerton		Well	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP375428
CH127	Milcombe			Pump	A	C20	2	Local Authority	Intermediate	Limestone	UN	SP409346
CH128	Banbury	Bus Station		Bath	E	C19	3	Private	Open	Limestone	UN	SP459406
CH129	Wardington	Williamscot		Spring	A	UN	1	Local Authority	Intermediate	Limestone	UN	SP481455
CH130	Hook Norton	Hook Norton		Spring	A	PM	UN	Unknown	Intermediate	Limestone	UN	SP350332
CH131	Wardington	Upper Wardington		Spring	A	PM	1	Private	Intermediate	Limestone	UN	SP496460
CH132	Wardington	Upper Wardington		Pump	A	C19	3	Private	Intermediate	Limestone	UN	SP496460
CH133	Wardington	Wardington		Pump	A	C19	3	Private	Intermediate	Limestone	UN	SP492463
CH134	Cropredy	Cropredy		Well	A	PM	2	Private	Open	Limestone	UN	SP469469
CH135	Cropredy	Cropredy		Pumping Station	B	C20	1	National/ Regional	Open	Limestone	UN	SP469465
CH136	Cropredy	Cropredy		Well	A	C20	2	Private	Open	Limestone	UN	SP469467

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH137	Mollington	Mollington		Pump	A	C19	1	Private	Closed	Limestone	UN	SP443474
CH138	Mollington	Mollington		Pump	A	C19	UN	Private	Closed	Limestone	UN	SP439475
CH139	Mollington	Mollington		Spring	A	PM	3	Local Authority	Closed	Limestone	UN	SP440475
CH140	Upper Heyford			Water Tower	C	C20	1	National/ Regional	Intermediate	Limestone	UN	SP510258
CH141	Bourton	Little Bourton		Well	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP458443
CH142	HanWell			Spring	A	PM	1	Local Authority	Closed	Limestone	UN	SP435438
CH143	HanWell			Pump	A	C19	2	Local Authority	Closed	Limestone	UN	SP434436
CH144	Hornton			Pump	A	C19	UN	Private	Intermediate	Limestone	UN	SP392447
CH145	Wroxton	Balscote		Spring	A	C17	1	Private	Intermediate	Limestone	UN	SP391417
CH146	Wroxton	Balscote		Spring	A	UN	1	Private	Intermediate	Limestone	UN	SP392418
CH147	Wroxton	Balscote		Well	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP392418
CH148	Wroxton			Pump	A	C19	2	Local Authority	Intermediate	Limestone	UN	SP414418
CH149	Wroxton			Spring	A	PM	1	Local Authority	Intermediate	Limestone	UN	SP414418
CH150	Drayton			Pump	A	C19	2	Private	Closed	Limestone	UN	SP428417
CH151	Shutford		The Tyte	Spring	A	PM	1	Local Authority	Closed	Limestone	UN	SP386401
CH152	Sibford Gower	Lane Head		Well	A	PM	2	Private	Intermediate	Limestone	UN	SP350378
CH153	Sibford Ferris			Spring	A	PM	4	Local Authority	Intermediate	Limestone	UN	SP356373
CH154	Sibford Gower	Burdrop		Spring	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP358377

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH155	Swalcliffe			Tap	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP379379
CH156	Swalcliffe			Tap	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP379378
CH157	Swalcliffe			Pump	A	PM	2	Private	Intermediate	Limestone	UN	SP379378
CH158	Bloxham	Prints Cottage		Pump	A	PM	2	Private	Open	Limestone	UN	SP427355
CH159	Bloxham			Spring	A	PM	1	Private	Open	Limestone	UN	SP430358
CH160	Broughton		Wyatt AlmsHouses	Well	A	C19	2	Private	Closed	Limestone	UN	SP421384
CH161	North Newington			Pump	A	C19	2	Private	Closed	Limestone	UN	SP416399
CH162	Steeple Aston			Pump	A	C19	2	Private	Open	Limestone	UN	SP477259
CH163	Steeple Aston			Pump	A	C19	2	Private	Open	Limestone	UN	SP477260
CH164	Milton			Trough	A	C20	2	Private	Intermediate	Limestone	UN	SP452351
CH165	Kidlington			Well	A	C20	5	Local Authority	Open	Clay	UN	SP485145
CH166	Barford St John			Well	A	PM	2	Local Authority	Closed	Limestone	UN	SP438331
CH167	Barford St Michael			Tap	A	C20	3	Local Authority	Closed	Limestone	UN	SP438326
CH168	Fringford	Church Farm		Pump	A	C19	2	Private	Closed	Limestone	UN	SP606291
CH169	Deddington	Hempton		Well	A	PM	3	Local Authority	Open	Limestone	UN	SP444318
CH170	Deddington	Hempton		Tap	A	PM	3	Local Authority	Open	Limestone	UN	SP446318
CH171	Deddington	Hempton		Tap	A	PM	3	Local Authority	Open	Limestone	UN	SP445318

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH172	Hook Norton	Down End		Pump	A	PM	4	Local Authority	Intermediate	Limestone	UN	SP358332
CH173	Hook Norton			Pump	A	PM	2	Private	Intermediate	Limestone	UN	SP352332
CH174	Hook Norton	Netting Lane		Well	A	PM	2	Private	Intermediate	Limestone	UN	SP357330
CH175	Hook Norton	Sun Inn		Pump	A	PM	2	Private	Intermediate	Limestone	UN	SP355331
CH176	Hook Norton	Brewery		Well	A	PM	UN	Private	Intermediate	Limestone	UN	SP348333
CH177	Hook Norton	Pear Tree Inn		Well	A	PM	3	Private	Intermediate	Limestone	UN	SP351332
CH178	Wigginton	Manor Farm		Pump	A	C19	3	Local Authority	Intermediate	Limestone	UN	SP390334
CH179	Wigginton			Pump	A	C19	2	Local Authority	Intermediate	Limestone	UN	SP389332
CH180	Wigginton			Pump	A	C19	3	Local Authority	Intermediate	Limestone	UN	SP389333
CH181	Wigginton			Reservoir	C	C20	1	National/ Regional	Intermediate	Limestone	UN	SP385345
CH182	South Newington			Pump	A	C20	2	Local Authority	Intermediate	Limestone	UN	SP409331
CH183	Duns Tew			Pump	A	C19	3	Private	Closed	Limestone	UN	SP459287
CH184	Duns Tew			Pump	A	C19	3	Local Authority	Closed	Limestone	UN	SP457283
CH185	Mixbury			Pump	A	C19	2	Local Authority	Closed	Limestone	UN	SP607337
CH186	Cottisford			Pond	A	UN	1	Local Authority	Closed	Limestone	UN	SP589311
CH187	Fringford	Pump House, Rectory Lane		Pump	A	C19	2	Private	Closed	Limestone	UN	SP604290

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH188	Hethe	Whitmore Arms		Pump	A	C19	2	Private	Closed	Limestone	UN	SP593294
CH189	FritWell			Pump	A	C20	2	Local Authority	Closed	Limestone	UN	SP528294
CH190	FritWell			Pond	A	PM	1	Local Authority	Closed	Limestone	UN	SP528297
CH191	FritWell			Well	A	PM	2	Private	Closed	Limestone	UN	SP528293
CH192	FritWell			Well	A	PM	2	Private	Closed	Limestone	UN	SP527290
CH193	FritWell			Pump	A	PM	4	Local Authority	Closed	Limestone	UN	SP527290
CH194	Somerton			Pump	A	C19	2	Private	Closed	Limestone	UN	SP498287
CH195	Somerton			Well	A	C19	3	Local Authority	Closed	Limestone	UN	SP498288
CH196	Somerton			Pump	A	C19	3	Private	Closed	Limestone	UN	SP497289
CH197	Upper Heyford			Tap	A	C20	1	National/ Regional	Intermediate	Limestone	UN	SP512246
CH198	Upper Heyford			Pump	A	C19	2	Private	Intermediate	Limestone	UN	SP496259
CH199	Upper Heyford			Well	A	PM	2	Private	Intermediate	Limestone	UN	SP496259
CH200	Upper Heyford			Tap	A	C20	2	Local Authority	Intermediate	Limestone	UN	SP496259
CH201	Upper Heyford			Tap	A	C20	3	Local Authority	Intermediate	Limestone	UN	SP495260
CH202	Lower Heyford			Tap	A	C20	3	Local Authority	Intermediate	Limestone	UN	SP486247
CH203	Lower Heyford			Tap	A	C20	3	Local Authority	Intermediate	Limestone	UN	SP489248
CH204	Lower Heyford			Well	A	C20	4	Local Authority	Intermediate	Limestone	UN	SP489248

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH205	Lower Heyford	Caulcott		Pond	A	UN	1	Local Authority	Intermediate	Limestone	UN	SP508242
CH206	Horton-cum-Studley			Well	A	PM	2	Private	Intermediate	Clay	UN	SP598124
CH207	Fenton & Murcott	Murcott		Pond	A	UN	1	Local Authority	Intermediate	Clay	UN	SP587157
CH208	Oddington		Wirepool	Pond	A	UN	1	Local Authority	Intermediate	Clay	UN	SP553150
CH209	Finmere	FulWell Road		Well	A	C19	2	Local Authority	Closed	Limestone	UN	SP634331
CH210	Islip			Pump	A	C19	2	Local Authority	Intermediate	Clay	UN	SP528139
CH211	Bletchingdon			Well head	A	C18	UN	Private	Closed	Limestone	UN	SP506180
CH212	Launton			Pond	A	UN	1	Local Authority	Intermediate	Clay	UN	SP612228
CH213	Stratton Audley			Tap	A	PM	3	Local Authority	Closed	Limestone	UN	SP608261
CH214	Stratton Audley	Stone row		Pump	A	C19	3	Private	Closed	Limestone	UN	SP607262
CH215	Yarnton			Well	A	PM	2	Private	Intermediate	Clay	UN	SP482121
CH216	Kidlington			Well	A	PM	2	Private	Open	Clay	UN	SP495145
CH217	Kidlington			Well	A	PM	2	Private	Open	Clay	UN	SP499141
CH218	Ardley			Well	A	PM	2	Private	Closed	Limestone	UN	SP540275
CH219	Weston-on-the-Green			Pond	A	UN	1	Local Authority	Closed	Limestone	UN	SP532190
CH220	Wendlebury			Well	A	PM	3	Private	Intermediate	Clay	UN	SP559194
CH221	Bucknell		Trigger Pond	Pond	A	UN	1	Local Authority	Closed	Limestone	UN	SP559254
CH222	Bucknell			Well	A	PM	2	Private	Closed	Limestone	UN	SP561256

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH223	Shenington with Alkerton			Pump	A	C19	3	Private	Intermediate	Limestone	UN	SP372427
CH224	Shenington with Alkerton			Well	A	PM	2	Private	Intermediate	Limestone	UN	SP372428
CH225	Claydon with Clattercote			Well	A	PM	2	Private	Closed	Limestone	UN	SP457499
CH226	HanWell			Well	A	PM	2	Private	Closed	Limestone	UN	SP439439
CH227	Sibford Gower			Tap	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP351378
CH228	Kirtlington			Pond	A	UN	1	Local Authority	Closed	Limestone	UN	SP500199
CH229	Shenington with Alkerton	Shenington		Pond	A	UN	5	Local Authority	Intermediate	Limestone	UN	SP372428
CH230	Banbury	Grimsbury		Reservoir	C	C20	1	National/ Regional	Open	Limestone	UN	SP459421
CH231	Banbury			Swimming pool	D	C20	1	Local Authority	Open	Limestone	UN	SP446405
CH232	Wardington	Upper Wardington		Spring	A	C17	2	Private	Intermediate	Limestone	UN	SP497461
CH233	Upper Heyford			Water Tower	C	C20	1	National/ Regional	Intermediate	Limestone	UN	SP504259
CH234	Banbury	Newland Road		Conduit	A	PM	5	Local Authority	Open	Limestone	UN	SP456403
CH235	Banbury	North Bar Street		Pump	A	PM	5	Unknown	Open	Limestone	UN	SP453401
CH236	Banbury			Bath	E	PM	5	Unknown	Open	Limestone	UN	SP450405

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH237	Banbury	Corner Horsefair and High Street		Pond	A	PM	5	Unknown	Open	Limestone	UN	SP454404
CH238	Banbury	Newland Road		Pond	A	PM	5	Unknown	Open	Limestone	UN	SP456402
CH239	Banbury	Newland Road		Well	A	PM	5	Unknown	Open	Limestone	UN	SP457404
CH240	Banbury	Newland Road		Well	A	PM	5	Unknown	Open	Limestone	UN	SP457404
CH241	Banbury	Market Place		Pond	A	PM	5	Unknown	Open	Limestone	UN	SP457406
CH242	Banbury	End of Market Place by Bridge Street		Pump	A	PM	5	Unknown	Open	Limestone	UN	SP458406
CH243	Banbury	Newland Road		Spring	A	PM	5	Unknown	Open	Limestone	UN	SP455401
CH244	Drayton	High Street		Pump	A	PM	5	Local Authority	Closed	Limestone	UN	SP429418
CH245	Finmere	Mere Road		Well	A	C19	5	Local Authority	Closed	Limestone	UN	SP640327
CH246	Hook Norton	Brewery		Water Tower	C	PM	1	Private	Intermediate	Limestone	UN	SP348333
CH247	Sibford Gower			Spring	A	UN	UN	Local Authority	Intermediate	Limestone	UN	SP354378
CH248	Gosford and Water Eaton		Kings Weir	Pumping station	B	C19	5	Local Authority	Closed	Clay	UN	SP480104
CH249	Banbury			Reservoir	C	C19	5	Local Authority	Open	Limestone	UN	SP454397
CH250	Banbury	The Causeway		Residential	G	C19	1	Local Authority	Open	Limestone	UN	SP464407
CH251	Banbury			Sewage works	F	C19	3	National/ Regional	Open	Limestone	UN	SP460404
CH252	Banbury			Swimming pool	D	C19	5	Local Authority	Open	Limestone	UN	SP459412

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
CH253	Bloxham	Queens Square		Residential	G	PM	5	Private	Open	Limestone	UN	SP428356
CH254	Bloxham		Bloxham and District Water Co	Waterworks	B	C19	5	Private	Open	Limestone	UN	SP425356
CH255	Fringford	Post Office		Well	A	C19	UN	Private	Closed	Limestone	UN	SP605289
CH256	HanWell	HanWell Castle		Fountain	A	C18	5	Private	Closed	Limestone	UN	SP436437

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Catalogue of Sites in Oxford District

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
OX001	Oxford	Carfax, High Street, Oxford	Carfax Tower	Fountain	A	C19	2	Local Authority	Open	Clay	UN	SP513062
OX002	Oxford	Turl Street, Oxford	St Mary the Virgin Church	Pump	A	C19	3	Local Authority	Open	Clay	UN	SP517065
OX003	Oxford	The Prince of Wales, Church Way, Iffley		Pump	A	C19	2	Private	Open	Clay	UN	SP528038
OX004	Oxford	Headington Road, Oxford	Headington Reservoir	Reservoir	C	C19	2	National/ Regional	Open	Clay	UN	SP534068
OX005	Oxford	The Plain, St Clements, Oxford	Victoria Fountain	Fountain	A	C19	2	Local Authority	Open	Clay	LB	SP522060
OX006	Oxford	Botanic Gardens, High Street, Oxford		Fountain	A	C19	1	Private	Open	Clay	LB	SP520061
OX007	Oxford	St Margaret's Church, Binsey Lane, Binsey, Binsey	St Margaret's Well	Holy Well	A	MED	1	Private	Open	Clay	LB	SP486081
OX008	Oxford	Abingdon Road, Oxford		Trough	A	C20	5	Local Authority	Open	Clay	UN	SP517047
OX009	Oxford	Outside Lamb and Flag, St Giles, Oxford	Well	Well	A	C19	5	Local Authority	Open	Clay	HER	SP513068

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
OX010	Oxford	Graveyard, St Cross Church, HolyWell, Oxford	Jenny Newton's Well	Well	A	MED	5	Private	Open	Clay	UN	SP521066
OX011	Oxford	Oxford	Oxford Castle	Well	A	MED	2	Local Authority	Open	Clay	SM	SP510062
OX012	Oxford	HolyWell Manor House	Holy Well	Well	A	MED	5	Private	Open	Clay	LB	SP520067
OX013	Oxford	Walton Well Road, Oxford	Walton Well	Fountain	A	C19	2	Local Authority	Open	Clay	LB	SP505073
OX014	Oxford	Lloyds Bank, plaque, NE corner of Carfax	Carfax Conduit - site	Conduit	A	C17	5	Local Authority	Open	Clay	LB	SP513062
OX015	Oxford	E side of Folly Bridge, moved to Isis St		Waterworks	B	PM	5	Local Authority	Open	Clay	HER	SP515055
OX016	Oxford	Carfax, Oxford	Carfax Conduit - site of	Conduit	A	C17	5	Local Authority	Open	Clay	LB	SP513062
OX017	Oxford	Butcher's Row, Oxford		Well	A	PM	5	Local Authority	Open	Clay	HER	SP512062
OX018	Oxford	10/12 Middle Way, Oxford		Well	A	PM	5	Private	Open	Clay	HER	SP506091
OX019	Oxford	Lake St, New Hinksey		Waterworks	B	PM	3	Local Authority	Open	Clay	HER	SP514048
OX020	Oxford	Great Quadrangle, Christchurch College, St Aldates, Oxford	Mercury Fountain	Fountain	A	C17	1	Private	Open	Clay	LB	SP515060
OX021	Oxford	Radcliffe Infirmary, Woodstock Road, Oxford		Fountain	A	C19	1	Private	Open	Clay	LB	SP510071
OX022	Oxford	Isis Street		Waterworks	B	C19	5	Local Authority	Open	Clay	HER	SP513056

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
OX023	Oxford	Oxford Castle	Trough	Trough	A	PM	4	Local Authority	Open	Clay	UN	SP510062
OX024	Oxford	New College		Tap	A	PM	1	Private	Open	Clay	UN	SP518064
OX025	Oxford	St Giles		Pond	A	UN	5	Local Authority	Open	Clay	UN	SP512069
OX026	Oxford	Corpus Christi		Trough	A	C18	2	Private	Open	Clay	UN	SP516060
OX027	Oxford	Queen Elizabeth House		Tap	A	PM	5	Private	Open	Clay	UN	SP512069
OX028	Oxford	Walton Street	Oxford University Press	Reservoir	C	C19	2	Private	Open	Clay	UN	SP508069
OX029	Oxford	HolyWell Green	Holy Well	Holy Well	A	C17	5	Unknown	Open	Clay	UN	SP520065
OX030	Oxford		Pule Well	Holy Well	A	MED	5	Unknown	Open	Clay	UN	SP513061
OX031	Oxford	Osney	Harold's Well	Holy Well	A	C17	5	Unknown	Open	Clay	UN	SP505060
OX032	Oxford		Ulward's Well	Holy Well	A	C17	5	Unknown	Open	Clay	UN	SP513061
OX033	Oxford		Child's Well	Holy Well	A	C16	5	Unknown	Open	Clay	UN	SP509061
OX034	Oxford		Stock Well	Well	A	MED	5	Unknown	Open	Clay	UN	SP509065
OX035	Oxford	Long Wall Street	Crow Well	Holy Well	A	MED	5	Unknown	Open	Clay	UN	SP519065
OX036	Oxford		Slaying Well	Holy Well	A	C17	5	Unknown	Open	Clay	UN	SP513060
OX037	Oxford		Aylmer's Well	Holy Well	A	MED	5	Unknown	Open	Clay	UN	SP501091
OX038	Oxford	HolyWell	Holy Well	Holy Well	A	MED	5	Unknown	Open	Clay	UN	SP520067
OX039	Oxford		Aristotle's Well	Holy Well	A	MED	5	Unknown	Open	Clay	UN	SP503079
OX040	Oxford		Postern Well	Holy Well	A	C17	5	Unknown	Open	Clay	UN	SP519063
OX041	Oxford	Wolvercote	St Frideswide's Well	Holy Well	A	MED	5	Private	Open	Clay	UN	SP484091
OX042	Oxford	Cowley	St Edmund's Well	Holy Well	A	MED	5	Unknown	Open	Clay	UN	SP525061
OX043	Oxford	Cowley	St Bartholomew's Well	Well	A	MED	5	Unknown	Open	Clay	UN	SP545043
OX044	Oxford		St Mary's Well	Holy Well	A	C17	5	Unknown	Open	Clay	UN	SP516065
OX045	Oxford	Wolvercote		Water Tower	C	PM	UN	Private	Open	Clay	UN	SP496096

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
OX046	Oxford	Queens College		Fountain	A	C18	2	Private	Open	Clay	LB	SP518064
OX047	Oxford	Magdalen College		Latrine	F	C18	3	Private	Open	Clay	LB	SP522062
OX048	Oxford	Oriel College		Pump	A	C18	2	Private	Open	Clay	LN	SP516061
OX049	Oxford	St Edmund Hall		Well	A	MED	2	Private	Open	Clay	LB	SP519063
OX050	Oxford	All Souls College		Tank	C	C20	5	Private	Open	Clay	UAD	SP517063
OX051	Oxford	Oriel College		Tank	C	C20	5	Private	Open	Clay	UAD	SP516062
OX052	Oxford	Bodleian Quadrangle		Tank	C	C20	5	Private	Open	Clay	UAD	SP516064
OX053	Oxford	Lincoln College		Tank	C	C20	5	Private	Open	Clay	UAD	SP515063
OX054	Oxford	Pembroke College		Tank	C	C20	5	Private	Open	Clay	UAD	SP513060
OX055	Oxford	Queens College		Tank	C	C20	5	Private	Open	Clay	UAD	SP518063
OX056	Oxford	St John's College		Tank	C	C20	5	Private	Open	Clay	UAD	SP513067
OX057	Oxford	Magdalen College		Bath	E	MED	4	Private	Open	Clay	UAD	SP522062
OX058	Oxford	Corpus Christi College		Well	A	PM	4	Private	Open	Clay	UAD	SP516061
OX059	Oxford	43 St Giles		Well	A	PM	5	Private	Open	Clay	UAD	SP511068
OX060	Oxford	Christ Church Cathedral		Well	A	MED	4	Private	Open	Clay	UAD	SP515059
OX061	Oxford	New College	Long Room	Latrine	F	MED	3	Private	Open	Clay	UAD	SP518064
OX062	Oxford	Ashmolean Museum		Tank	C	C20	5	Private	Open	Clay	UAD	SP512065
OX063	Oxford	Old Ashmolean Museum		Well	A	PM	5	Private	Open	Clay	UAD	SP515064
OX064	Oxford	Radcliffe Camera		Tank	C	C20	5	Private	Open	Clay	UAD	SP516063
OX065	Oxford	4 Broad Street		Well	A	PM	5	Unknown	Open	Clay	UAD	SP513064
OX066	Oxford	Broad Street		Well	A	PM	5	Unknown	Open	Clay	UAD	SP513064
OX067	Oxford	High Street		Pipe	A	C17	5	Local Authority	Open	Clay	UAD	SP514062
OX068	Oxford	Lincoln College		Pipe	A	C17	5	Private	Open	Clay	UAD	SP515063
OX069	Oxford	Nuffield College		Pond	A	C20	1	Private	Open	Clay	LB	SP510063
OX070	Oxford	New Hinksey	Hinksey Pool	Swimming Pool	D	PM	1	Local Authority	Open	Clay	UN	SP514048

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
OX071	Oxford		Tumbling Bay	Swimming Pool	D	PM	4	Local Authority	Open	Clay	UN	SP502066
OX072	Oxford	Broad Street		Pump	A	C17	5	Local Authority	Open	Clay	UN	SP515065
OX073	Oxford			Shaduf	A	C17	5	Unknown	Open	Clay	UN	SP510061
OX074	Oxford	St Aldates		Pump	A	C17	5	Local Authority	Open	Clay	UN	SP514061
OX075	Oxford	Queen Elizabeth House		Pump	A	PM	4	Private	Open	Clay	UN	SP512062
OX076	Oxford	Cornmarket		Pump	A	C17	5	Local Authority	Open	Clay	UN	SP513063
OX077	Oxford	Magdalen Street		Pump	A	C17	5	Local Authority	Open	Clay	UN	SP512064
OX078	Oxford	St Giles		Pump	A	C17	5	Local Authority	Open	Clay	UN	SP511068
OX079	Oxford	Turl Street		Tap	A	PM	5	Local Authority	Open	Clay	UN	SP515063
OX080	Oxford	Rosehill Cemetery		Pump	A	PM	3	Local Authority	Open	Clay	UN	SP537039
OX081	Oxford	Botanic Garden		Pond	A	PM	3	Private	Open	Clay	UN	SP520060
OX082	Oxford	Botanic Garden		Tank	C	C18	2	Private	Open	Clay	UN	SP521061
OX083	Oxford	Botley Road		Fountain	A	C19	4	Local Authority	Open	Clay	UN	SP500062
OX084	Oxford	Jericho	St Barnabas Baths	Bath	E	C20	5	Local Authority	Open	Clay	UN	SP507068
OX085	Oxford	Catherine Street	East Oxford Slipper Baths	Bath	E	C20	5	Private	Open	Clay	UN	SP531049
OX086	Oxford	Cripley Road		Trough	A	C19	5	Local Authority	Open	Clay	UN	SP504063
OX087	Littlemore	Littlemore		Pumping station	B	PM	5	Local Authority	Open	Clay	HER	SP526032
OX088	Oxford	Bath Steet	St Clements Baths	Bath	E	C18	5	Private	Open	Clay	UN	SP525062
OX089	Oxford	Oxford Prison		Tank	C	PM	4	Local Authority	Open	Clay	UN	SP509062
OX090	Oxford	Oxford Castle		Pump	A	PM	5	Local Authority	Open	Clay	UN	SP509062
OX091	Oxford	Botley		Aqueduct	A	MED	5	Unknown	Open	Clay	UN	SP492060
OX092	Oxford	Chabad Centre, Cowley Road		Bath	E	C20	1	Private	Open	Clay	UN	SP525059

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
OX093	Oxford	59-65 New High Street, Headington		Well	A	PM	5	Private	Open	Clay	UN	SP547069
OX094	Oxford	Bath Place		Bath	E	C19	5	Private	Open	Clay	UN	SP511061
OX095	Oxford	Paradise Square		Bath	E	C20	5	Local Authority	Open	Clay	UN	SP510069
OX096	Oxford	Merton Street		Swimming Pool	D	C19	5	Private	Open	Clay	UN	SP518061
OX097	Oxford	St Giles		Latrine	F	C19	1	Local Authority	Open	Clay	UN	SP512066
OX098	Oxford	Magdalen Street East		Latrine	F	C20	1	Local Authority	Open	Clay	UN	SP513065
OX099	Oxford	The Hamel	Christchurch Old Buildings	Residential	G	C19	3	Private	Open	Clay	UN	SP508061
OX100	Oxford	Osney Lane	Chirst Church New Buildings	Residential	G	C19	5	Private	Open	Clay	UN	SP507061
OX101	Oxford	Old Ashmolean Museum		Well	A	PM	2	Private	Open	Clay	UN	SP515064
OX102	Oxford	University Parks	Parson's Pleasure	Swimming Pool	D	C16	2	Private	Open	Clay	UN	SP521071
OX103	Oxford	University Parks	Dame's Delight	Swimming Pool	D	C20	4	Private	Open	Clay	UN	SP252071
OX104	Oxford	St Ebbe's		Swimming Pool	D	C19	5	Local Authority	Open	Clay	UN	SP509055
OX105	Oxford	Long Bridges, near Donnington Bridge		Swimming Pool	D	C19	4	Local Authority	Open	Clay	UN	SP522047
OX106	Oxford	Wolvercote		Swimming Pool	D	C19	4	Local Authority	Open	Clay	UN	SP487094
OX107	Oxford	Cuttesloe	Sunnymede	Swimming Pool	D	C20	5	Local Authority	Open	Clay	UN	SP513098
OX108	Oxford	St Clements		Swimming Pool	D	C19	5	Local Authority	Open	Clay	UN	SP527064

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
OX109	Oxford	Temple Cowley		Swimming Pool	D	C20	4	Local Authority	Open	Clay	UN	SP544044
OX110	Oxford	Headington		Reservoir	C	C19	5	Local Authority	Open	Clay	UN	SP537065
OX111	Oxford	67 Old High Street, Headington	British Workman	Bath	E	C19	5	Private	Open	Clay	UN	SP546074
OX112	Oxford	Town Hall		Fountain	A	C19	5	Local Authority	Open	Clay	UN	SP514062
OX113	Oxford	Oxford Market		Fountain	A	C19	5	Private	Open	Clay	UN	SP513063
OX114	Oxford	Littlegate Street		Fountain	A	C19	5	Local Authority	Open	Clay	UN	SP512059
OX115	Oxford	Magdalen Bridge		Fountain	A	C19	5	Local Authority	Open	Clay	UN	SP521061
OX116	Oxford	Merton Street		Bath	E	C19	5	Private	Open	Clay	UN	SP519062
OX117	Oxford	Hythe Bridge Street		Bath	E	C19	5	Private	Open	Clay	UN	SP507063
OX118	Oxford	Cornmarket Street		Bath	E	C19	5	Private	Open	Clay	UN	SP513063
OX119	Oxford	Cornmarket		Tank	C	C17	5	Local Authority	Open	Clay	UN	SP513062
OX120	Oxford	Magdalen College		Culvert	A	MED	5	Private	Open	Clay	UN	SP521063
OX121	Oxford	High Street		Drain	F	MED	5	Local Authority	Open	Clay	UN	SP515062
OX122	Oxford	Castle Street		Drain	F	MED	5	Local Authority	Open	Clay	UN	SP511061
OX123	Oxford	Merton College		Pipe	A	MED	5	Private	Open	Clay	UN	SP518060
OX124	Oxford	St Thomas Street Brewery		Pump	A	C19	5	Private	Open	Clay	UN	SP508061
OX125	Oxford	Botley Road	Dodson's Temperance Hotel	Residential	G	C19	3	Private	Open	Clay	UN	SP504062
OX126	Oxford	Park End Street	Castle Temperance Hotel	Residential	G	C19	3	Private	Open	Clay	UN	SP506062
OX127	Oxford	98 St Clements		Residential	G	C19	5	Private	Open	Clay	UN	SP524060
OX128	Oxford	13 Norham Gardens		Residential	G	C19	1	Private	Open	Clay	UN	SP513074

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
OX129	Oxford	113 Woodstock Road		Residential	G	C19	1	Private	Open	Clay	UN	SP507083
OX130	Oxford	60 Banbury Road		Residential	G	C19	3	Private	Open	Clay	UN	SP511075
OX131	Oxford	Friars Street		Residential	G	C19	5	Private	Open	Clay	UN	SP510057
OX132	Oxford	Queen Street	Wilberforce Temperance Hotel	Residential	G	C19	3	Private	Open	Clay	UN	SP513062
OX133	Oxford	1 Belbroughton Road		Residential	G	C19	UN	Private	Open	Clay	UN	SP510084
OX134	Oxford			Spring	A	MED	5	Private	Open	Clay	UN	SP535066
OX135	Oxford	St Edward's School		Swimming Pool	D	C19	3	private	Open	Clay	UN	SP506090
OX136	Oxford	St Clements		Well	A	PM	5	Unknown	Open	Clay	UN	SP523060
OX137	Oxford	Godstow Abbey		Well	A	MED	4	Private	Open	Clay	UN	SP484091
OX138	Oxford	36-37 Pembroke Street		Bath	E	C19	4	Private	Open	Clay	UN	SP513064

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Catalogue of Sites in South Oxfordshire District

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO001	Woodeaton	Woodeaton Manor, Woodeaton	Woodeaton Manor	Water Tower	C	C18	2	Private	Closed	Clay	LB	SP535120
SO002	Woodeaton	Main Street, Woodeaton	Holy Rood Well	Well	A	PM	4	Local Authority	Closed	Clay	HER	SP535119
SO003	Great Milton	The Green, Great Milton	Great Milton Well	Well	A	PM	3	Local Authority	Closed	Clay	UN	SP630028
SO004	Great Milton	Priory Bank, The Green, Great Milton	Great Milton Pump	Pump	A	C19	3	Private	Closed	Clay	LB	SP630027
SO005	Highmoor	Well Cottage, Highmoor Cross	Highmoor Cross	Well	A	C19	1	Private	Open	Chalk	HER	SU701843
SO006	Rotherfield Greys	Greys Court, Rotherfield Greys	Donkey Wheel and Well House	Well	A	C16	1	National/ Regional	Open	Chalk	SM	SU724835
SO007	Rotherfield Greys	Greys Court, Rotherfield Greys	Dower House Pump	Pump	A	C19	2	National/ Regional	Open	Chalk	UN	SU724834
SO008	Sonning Common	Gallowstree Common Road, Gallowstree Common	Gallowstree Common Well	Well	A	C19	2	Local Authority	Closed	Chalk	UN	SU701811
SO009	Kidmore End	Wood Lane, Kidmore End	Kidmore End Well	Well	A	C19	2	Local Authority	Intermediate	Chalk	LB	SU698794

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO010	Ipsden	Kit Lane, Stoke Row	Maharajah's Well	Well	A	C19	2	Private	Intermediate	Chalk	LB	SU680841
SO011	Wallingford	Market Place, Wallingford		Fountain	A	C19	2	Local Authority	Open	Sand	LB	SU607894
SO012	Ipsden	The Street, Ipsden	Ipsden Well	Well	A	C19	2	Local Authority	Intermediate	Chalk	UN	SU636842
SO013	ShipLake	Main Street, ShipLake Row		Well	A	C19	2	Local Authority	Intermediate	Chalk	UN	SU752785
SO014	Henley-on-Thames	Hart Street, Henley-on-Thames	Phillimore Fountain	Fountain	A	C19	2	Local Authority	Open	Chalk	LB	SU762827
SO015	Pishill with Stonor	No 15, Cottages by Upper Assendon Farm, Stonor		Well	A	UN	3	Private	Closed	Chalk	UN	SU735883
SO016	Chinnor	Hempton Wainhill, Chinnor		Pump	A	C19	3	Private	Closed	Sand	UN	SP767016
SO017	Little Wittenham			Pump	A	C19	5	Unknown	Closed	Sand	UN	SU565932
SO018	Towersey	Kingsey Road, Towersey		Waterworks	B	C20	5	Private	Closed	Sand	UN	SP729062
SO019	Ewelme	God's Close, Almshouses, High Street, Ewelme	Ewelme Almshouses	Well	A	C19	2	Private	Intermediate	Sand	UN	SU646914

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO020	Great Haseley	Rycote Chapel, Rycote Park, Rycote Lane, Great Haseley	Rycote Chapel	Well	A	MED	5	Private	Intermediate	Clay	UN	SP667047
SO021	Ipsden	Braziers Lane, Ipsden		Well	A	UN	5	Unknown	Intermediate	Chalk	UN	SU635842
SO022	Ipsden	Bering Hill, Well Place		Well	A	UN	5	Unknown	Intermediate	Chalk	UN	SU650849
SO023	Ipsden	Urquhart Lane, Well Place		Well	A	UN	5	Unknown	Intermediate	Chalk	UN	SU651852
SO024	Harpsden	Perseverance Hill, Mays Green		Well	A	UN	5	Unknown	Open	Chalk	UN	SU750799
SO025	Nuneham Courtenay	Nuneham Park, Nuneham Courtenay	Carfax Conduit	Conduit	A	C17	3	Private	Closed	Clay	SM	SU537977
SO026	Wallingford	Market Place		Well	A	PM	5	Private	Open	Sand	HER	SU607894
SO027	Berinsfield	Berinsfield	Coll Well	Well	A	MED	5	Private	Open	Sand	NMR	SU579959
SO028	Ipsden	Ipsden		Well	A	RO	5	Unknown	Intermediate	Chalk	NMR	SU653850
SO029	Brightwell-cum-Sotwell	Brightwell cum Sotwell	Sat Well	Well	A	EMED	3	Private	Open	Sand	NMR	SU583909
SO030	Brightwell-cum-Sotwell	Brightwell cum Sotwell		Well	A	UN	5	Private	Open	Sand	HER	SU578902
SO031	Harpsden	Lower Bolney Farm		Well	A	PM	UN	Private	Open	Chalk	HER	SU772806
SO032	Nuneham Courtenay	Nuneham Courtenay		Pump	A	PM	3	Private	Closed	Clay	HER	SU543980

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO033	West Hagbourne			Pump House	A	C20	3	Unknown	Open	Sand	UN	SU505875
SO034	Little Milton	Wells Farm, Little Milton		Well	A	PM	UN	Private	Intermediate	Clay	HER	SP624015
SO035	Nuneham Courtenay	Nuneham Courtenay		Pump	A	PM	UN	Private	Closed	Clay	HER	SU545983
SO036	Stanton St John	Stanton St John		Well	A	RO	5	Unknown	Intermediate	Limestone	HER	SP578105
SO037	Garsington		Manual Spring	Spring	A	EMED	UN	Unknown	Intermediate	Clay	UN	SP589030
SO038	Forest Hill with Shotover	Forest Hill		Well	A	PM	5	Local Authority	Intermediate	Clay	HER	SP584077
SO039	Henley-on-Thames	Henley-on-Thames		Well	A	PM	5	Local Authority	Open	Chalk	HER	SU758825
SO040	Nuneham Courtenay	Nuneham Park, Nuneham Courtenay		Well head	A	PM	2	Private	Closed	Clay	LB	SU541977
SO041	Nuneham Courtenay	Nuneham Park, Nuneham Courtenay		Well Head	A	C19	2	Private	Closed	Clay	LB	SU540980
SO042	Beckley and Stowood	Wick Farm, Beckley		Well House	A	C17	2	Private	Closed	Limestone	LB	SP553086
SO043	Thame	Thame Park, Thame Park Road, Thame		Fountain	A	C19	2	Private	Open	Sand	LB	SP717038
SO044	Cholsey	Fairmile Hospital, Cholsey		Water Tower	C	C19	3	Local Authority	Open	Chalk	NMR	SU598860

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO045	Forest Hill with Shotover	Shotover		Well Head	A	C18	2	Private	Intermediate	Clay	LB	SP580060
SO046	Toot Baldon	The Queen's Cottage, Toot Baldon		Pump	A	C19	3	Private	Closed	Clay	LB	SP570010
SO047	Great Haseley	Haseley Court, Little Haseley		Fountain	A	C18	2	Private	Intermediate	Clay	LB	SP645006
SO048	Waterstock	Waterstock House, Waterstock		Pump House	A	C19	3	Private	Closed	Clay	LB	SP637057
SO049	Stadhampton	D'Oyley's Farm		Pond	A	UN	1	Private	Closed	Clay	UN	SU605989
SO050	Little Milton	Crossroads		Pump	A	C21	2	Local Authority	Intermediate	Clay	UN	SP619009
SO051	Little Milton	Allotments		Well	A	C18	2	National/ Regional	Intermediate	Clay	UN	SP622005
SO052	Thame	Upper High Street		Pond	A	UN	2	Local Authority	Open	Clay	UN	SP709057
SO053	ShipLake	ShipLake College		Water Tower	C	C19	2	Private	Intermediate	Chalk	LB	SU768783
SO054	ShipLake	River		Spring	A	PM	5	Unknown	intermediate	Chalk	UN	SU767781
SO055	Little Milton	Spring Cottage		Spring	A	PM	1	Private	Intermediate	Clay	UN	SP620007
SO056	Warborough			Pump	A	C20	2	Local Authority	Open	Sand	UN	SU597938
SO057	Adwell		Adda's Well	Well	A	MED	UN	Unknown	Closed	Sand	UN	SU699995
SO058	Beckley and Stowood	Woodperry	Woodperry Well	Well	A	PM	UN	Unknown	Closed	Limestone	UN	SP575104
SO059	Beckley and Stowood	Beckley	St Donanverdh Well	Well	A	MED	3	Unknown	Closed	Limestone	UN	SP565123

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO060	Berrick Salome		Hillpit Spring	Spring	A	PM	UN	Unknown	Intermediate	Sand	UN	SU625937
SO061	Bix and Assendon	Assendon	Phrophetic Spring	Well	A	PM	UN	Unknown	Intermediate	Chalk	UN	SU741853
SO062	Brightwell Baldwin		Cada's Well	Well	A	MED	UN	Unknown	Closed	Sand	UN	SU647957
SO063	Brightwell Baldwin	CadWell Farm	Holy Well	Well	A	EMED	5	Unknown	Closed	Sand	UN	SU647956
SO064	Britwell Salome		Briton's Well	Well	A	MED	UN	Unknown	Closed	Chalk	UN	SU673936
SO065	Crowell		Crow's Well	Well	A	MED	UN	Unknown	Intermediate	Chalk	UN	SU743997
SO066	Cuddesdon and Denton	Cuddesdon	White Horse Well	Spring	A	UN	UN	Unknown	Closed	Clay	UN	SP603030
SO067	Drayton St Leonard		Shad Well	Well	A	PM	UN	Unknown	Intermediate	Sand	UN	SU586970
SO068	Elsfield		Penny Well	Well	A	PM	UN	Unknown	Closed	Clay	UN	SP538099
SO069	Ewelme		Great Well	Well	A	MED	UN	Unknown	Intermediate	Sand	UN	SU642916
SO070	Ewelme		Ewelme Well	Well	A	PM	UN	Unknown	Intermediate	Sand	UN	SU647916
SO071	Garsington		Scholar's Well	Holy Well	A	PM	UN	Unknown	Intermediate	Clay	UN	SP584030
SO072	Garsington		Elf Well	Holy Well	A	MED	5	Unknown	Intermediate	Clay	UN	SP582033
SO073	Garsington		Combe Well	Holy Well	A	MED	5	Local Authority	Intermediate	Clay	UN	SP574026
SO074	Garsington		Pettiwell	Holy Well	A	UN	5	Unknown	Intermediate	Clay	UN	SP580021
SO075	Garsington		Priest's Well	Holy Well	A	UN	5	Unknown	Intermediate	Clay	UN	SP582020
SO076	Great Haseley		Queenshood Spring	Spring	A	PM	UN	Unknown	Intermediate	Clay	UN	SP650004
SO077	Nettlebed		Mother Hiddlemeer Spring	Holy Well	A	PM	UN	Unknown	Open	Chalk	UN	SU700870

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO078	Rotherfield Peppard		Sedgehill Spring	Well	A	MED	UN	Unknown	Intermediate	Chalk	UN	SU712810
SO079	Rotherfield Peppard		Kingswood Well	Well	A	PM	4	Local Authority	Intermediate	Chalk	UN	SU698821
SO080	Stanton St John		Nanny/ Nelly Martin's Well	Holy Well	A	PM	UN	Unknown	Intermediate	Limestone	UN	SP552086
SO081	Thame		Cottmoor Well	Holy Well	A	UN	5	Unknown	Open	Clay	UN	SP723052
SO082	Thame		Court Well	Holy Well	A	UN	4	Private	Open	Clay	UN	SP702059
SO083	Tiddington with Albury	Milton Common		Water Tower	C	C20	1	National/ Regional	Closed	Clay	UN	SP653035
SO084	Berinsfield	Fane Drive		Water Tower	C	C20	1	National/ Regional	Open	Sand	UN	SU574968
SO085	Crowmarsh	Howberry		Water Tower	C	C20	1	Private	Intermediate	Chalk	UN	SU614900
SO086	Henley-on-Thames	Riverbank gardens, Meadow Road	Obelisk	Tap	A	C18	4	Local Authority	Open	Chalk	LB	SU760830
SO087	Henley-on-Thames	Hart Street		Pump	A	PM	5	Local Authority	Open	Chalk	UN	SU763826
SO088	Henley-on-Thames	Between Deansfield Road and Greys Road	Henley Waterworks	Waterworks	B	C19	1	National/ Regional	Open	Chalk	UN	SU758823
SO089	Henley-on-Thames	Market Place	Obelisk	Fountain	A	C18	5	Local Authority	Open	Chalk	UN	SU760826
SO090	Henley-on-Thames	Hart Street/ Market Place	Phillimore Fountain	Fountain	A	C19	5	Local Authority	Open	Chalk	UN	SU761826

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO091	Nuneham Courtenay	Nuneham Home Farm		Water Tower	C	PM	UN	Private	Closed	Clay	UN	SU542982
SO092	Swyncombe	Coates Copse, Cookley Green		Water Tower	C	PM	UN	National/ Regional	Intermediate	Chalk	UN	SU693905
SO093	Thame			Water Tower	C	C20	5	Local Authority	Open	Clay	UN	SP711053
SO094	Wallingford			Water Tower	C	PM	UN	National/ Regional	Open	Sand	UN	SU600896
SO095	Watlington	Christmas Common		Water Tower	C	PM	UN	Unknown	Open	Chalk	UN	SU724954
SO096	Eye and Dunsden	Caversham		Reservoir	C	C20	1	National/ Regional	Closed	Chalk	UN	SU726774
SO097	Forest Hill with Shotover		Brasenose Reservoir	Reservoir	C	C20	1	National/ Regional	Intermediate	Limestone	UN	SP559064
SO098	Horspath		Horspath Reservoir	Reservoir	C	C20	1	National/ Regional	Closed	Clay	UN	SP575058
SO099	Holton	Holton Park		Conduit	A	C16	2	Private	Closed	Clay	LB	SP598064
SO100	Kidmore End	Well Cottage, The Hamlet, Gallowstree Common		Well House	A	C19	2	Local Authority	Intermediate	Chalk	LB	SU691802
SO101	Newington	Newington House		Latrine	F	C17	3	Private	Intermediate	Sand	LB	SU609964
SO102	Shirburn	Shirburn Castle		Pump	A	C19	UN	Private	Closed	Sand	LB	SU696971
SO103	Stanton St John	Woodperry		Water Tower	C	C18	2	Private	Intermediate	Limestone	LB	SP576105
SO104	Stanton St John	Woodperry		Pump House	A	C18	2	Private	Intermediate	Limestone	LB	SP577106
SO105	Brightwell-cum-Sotwell	The Street		Well	A	PM	5	Local Authority	Open	Sand	UN	SU582907

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO106	Woodeaton	Woodeaton Manor		Tank	C	C20	2	Local Authority	Closed	Clay	UN	SP534120
SO107	Waterperry with Thomley	Waterperry House		Water Tower	C	PM	UN	Private	Closed	Limestone	UN	SP629064
SO108	Beckley and Stowood	Beckley Park		Latrine	F	C16	UN	Private	Closed	Clay	LB	SP577120
SO109	Stadhampton	The Old Vicarage, Copson Lane		Pump	A	C19	UN	Private	Closed	Clay	LB	SU604988
SO110	Mapledurham			Wash House	E	C19	UN	Private	Closed	Chalk	LB	SU670767
SO111	Mapledurham	Mapledurham Mill		Pump House	A	C19	UN	Private	Closed	Chalk	LB	SU670767
SO112	Shirburn	Shirburn Lodge		Pump	A	PM	UN	Private	Closed	Chalk	HER	SU718943
SO113	Rotherfield Greys	Greys Court		Pump	A	C19	3	Private	Open	Chalk	HER	SU724834
SO114	Swyncombe	Range Botton, Warburg Nature Reserve		Well	A	PM	UN	National/ Regional	Intermediate	Chalk	HER	SU721879
SO115	Shirburn	Shirburn Castle		Pump house	A	C19	UN	Private	Closed	Sand	LB	SU695971
SO116	Shirburn	Shirburn Castle		Water Tower	C	C19	UN	Private	Closed	Chalk	LB	SU697960
SO117	Ipsden			Pump	A	C19	2	National/ Regional	Intermediate	Chalk	UN	SU634857
SO118	Goring Heath	Butler's Farm, Whitchurch Hill		Pond	A	UN	2	Private	Intermediate	Chalk	UN	SU639788
SO119	Goring Heath	Whitchurch Hill		Well	A	C19	2	Local Authority	Intermediate	Chalk	UN	SU640789

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO120	Goring Heath	Hill Bottom, Whitchurch Hill		Reservoir	C	C19	5	Private	Intermediate	Chalk	UN	SU643793
SO121	Goring Heath	Hill Bottom, Whitchurch Hill		Pumping Station	B	C19	4	Private	Intermediate	Chalk	UN	SU637787
SO122	Kidmore End			Pond	A	UN	2	Local Authority	Intermediate	Chalk	UN	SU699793
SO123	Ewelme		Kings Pool	Pond	A	UN	2	Local Authority	Intermediate	Sand	UN	SU645915
SO124	Pishill & Stonor	Russell's Water		Pond	A	UN	2	Local Authority	Closed	Chalk	UN	SU708897
SO125	West Hagbourne			Pond	A	UN	2	Local Authority	Open	Sand	UN	SU513877
SO126	Thame	Moreton		Pond	A	UN	3	Local Authority	Open	Clay	UN	SP697048
SO127	Woodcote		Greenmoor Ponds	Pond	A	UN	2	Local Authority	Intermediate	Chalk	UN	SU646813
SO128	Woodcote			Reservoir	C	PM	3	National/ Regional	Intermediate	Chalk	UN	SU647812
SO129	Woodcote	Greenmoor		Well	A	PM	4	Local Authority	Intermediate	Chalk	UN	SU646813
SO130	Woodcote			Waterworks	B	PM	4	National/ Regional	Intermediate	Chalk	UN	SU647814
SO131	Benson		River Mead	Swimming pool	D	PM	3	Local Authority	Open	Sand	UN	SU614915
SO132	Benson		Benson Lido	Swimming pool	D	PM	5	Private	Open	Sand	UN	SU614915
SO133	Wallingford			Swimming pool	D	C20	1	Local Authority	Open	Sand	NMR	SU611895
SO134	Garsington	Garsington Manor		Swimming pool	D	C20	UN	Private	Intermediate	Clay	LB	SP582019

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO135	Waterperry with Thomley			Pump	A	C19	UN	Private	Closed	Limestone	LB	SP628064
SO136	Shirburn		Shirburn Castle	Park	D	C18	UN	Private	Closed	Sand	RPG	SU685960
SO137	Garsington		Garsington Manor	Park	D	C20	UN	Private	Intermediate	Clay	RPG	SP582019
SO138	Forest Hill with Shotover		Shotover	Park	D	C18	UN	Private	Intermediate	Clay	RPG	SP583068
SO139	Thame		Thame Park	Park	D	C18	UN	Private	Open	Sand	RPG	SP715037
SO140	Beckley and Stowood		Beckley Park	Park	D	C16	UN	Private	Closed	Clay	RPG	SP577120
SO141	Nuneham Courtenay		Nuneham Courtenay	Park	D	C18	UN	Private	Closed	Clay	RPG	SU542978
SO142	Thame	Buttermarket		Bath	E	C20	5	Private	Open	Clay	UN	SP707059
SO143	Thame	Upper High Street		Well	A	PM	3	Local Authority	Open	Clay	UN	SP707058
SO144	Thame	2 Priest End		Well	A	PM	2	Private	Open	Clay	UN	SP702062
SO145	Thame	Birdcage Yard		Pump	A	PM	5	Private	Open	Clay	UN	SP707059
SO146	Thame	Upper High Street		Pump	A	C18	2	Private	Open	Clay	UN	SP707058
SO147	Thame	Upper High Street		Pump	A	C19	5	Local Authority	Open	Clay	UN	SP709057
SO148	Thame	Park Terrace		Trough	A	C19	3	Private	Open	Clay	UN	SP712053
SO149	Thame	Southern Road		Well	A	PM	5	Local Authority	Open	Clay	UN	SP703057
SO150	Thame	East Street		Pump	A	PM	5	Local Authority	Open	Clay	UN	SP713057
SO151	Thame	North Street		Tank	C	PM	5	Local Authority	Open	Clay	UN	SP707059
SO152	Goring			waterworks	B	C19	3	National/ Regional	Intermediate	Chalk	UN	SU607817

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO153	Watlington			Reservoir	C	PM	1	National/ Regional	Open	Chalk	UN	SU701940
SO154	Watlington			Reservoir	C	C20	1	National/ Regional	Open	Chalk	UN	SU701916
SO155	Wallingford			Pump house	A	C19	4	Local Authority	Open	Sand	UN	SU613900
SO156	South Moreton			Pump house	A	PM	3	Private	Closed	Sand	UN	SU562880
SO157	Stanton St John			Reservoir	C	PM	2	Private	Intermediate	Limestone	UN	SP570090
SO158	Crowmarsh	The Lake, North Stoke		Spring	A	PM	2	Private	Intermediate	Chalk	UN	SU614862
SO159	Nuffield	Churchyard		Tap	A	PM	1	National/ Regional	Intermediate	Chalk	UN	SU668873
SO160	Great Haseley			Tap	A	C20	1	Private	Intermediate	Clay	UN	SP637022
SO161	Chinnor	Black Boy		Well	A	PM	UN	Private	Closed	Sand	UN	SP754010
SO162	Didcot	Station		Water Tower	C	C19	2	National/ Regional	Open	Sand	UN	SU525907
SO163	Eye and Dunsden	Dunsden		Well	A	C19	4	Local Authority	Closed	Chalk	UN	SU739771
SO164	Cholsey	Fairmile Hospital		Water Tower	C	C20	2	Private	Open	Chalk	UN	SU598861
SO165	Ipsden	Churchyard		Tap	A	C19	2	National/ Regional	Intermediate	Chalk	UN	SU634857
SO166	Crowmarsh	Mongewell		Lake	D	C18	2	Private	Intermediate	Chalk	UN	SU613880
SO167	Rotherfield Peppard	Peppard	Peppard Hospital	Water Tower	C	C19	5	National/ Regional	Open	Chalk	UN	SU700818
SO168	Rotherfield Greys			Well	A	C19	4	Local Authority	Open	Chalk	UN	SU734824
SO169	West Hagbourne			Pumping Station	B	PM	4	Private	Open	Sand	UN	SU510875

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO170	Towersey	Manor Road		Well	A	PM	5	Local Authority	Closed	Clay	UN	SP735052
SO171	Towersey	Church Lane		Well	A	PM	5	Local Authority	Closed	Clay	UN	SP735053
SO172	Dorchester			Water Tower	C	PM	5	Local Authority	Open	Sand	UN	SU578944
SO173	Drayton St Leonard	High Street	Methodist Church	Pump	A	PM	5	Local Authority	Intermediate	Sand	UN	SU596964
SO174	Drayton St Leonard	High Street	Fairview	Pump	A	PM	5	Local Authority	Intermediate	Sand	UN	SU597963
SO175	Drayton St Leonard	Ford Lane		Pump	A	PM	5	Local Authority	Intermediate	Sand	UN	SU597965
SO176	Long Wittenham		St Anthony's Well	Well	A	PM	3	Private	Open	Sand	UN	SU541935
SO177	Didcot			Water Tower	C	PM	5	Local Authority	Open	Sand	UN	SU516903
SO178	Wheatley	High Street		Pump	A	PM	5	Local Authority	Open	Clay	UN	SP594058
SO179	Wheatley	Crown Road	Crown Inn	Pump	A	PM	5	Private	Open	Clay	UN	SP599056
SO180	Wheatley	The Avenue		Pump	A	C20	5	Local Authority	Open	Clay	UN	SP605054
SO181	Brightwell-cum-Sotwell	Church Lane		Spring	A	PM	3	Local Authority	Open	Sand	UN	SU580910
SO182	Brightwell-cum-Sotwell	Village Hall		Fountain	A	PM	5	Local Authority	Open	Sand	UN	SU579909
SO183	Nettlebed	Nettlebed Common	The Sea, Stradwell Pond, Wanbone Pond	Pond	A	PM	4	Local Authority	Open	Chalk	UN	SU702873
SO184	Rotherfield Greys	Greys Green		Pond	A	PM	3	Local Authority	Open	Chalk	UN	SU718830
SO185	Ipsden	Homer		Pond	A	UN	2	Private	Intermediate	Chalk	UN	SU660858

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid Ref
SO186	Goring Heath	Whitchurch Hill	Tyne Pit	Pond	A	UN	2	Local Authority	Intermediate	Chalk	UN	SU638792
SO187	Goring	Crays Pond		Pond	A	UN	UN	Local Authority	Intermediate	Chalk	UN	SU657806
SO188	Mapledurham	Nuney Green		Pond	A	UN	UN	Local Authority	Closed	Chalk	UN	SU671794
SO189	Henley-on-Thames	Mill Lane		Pump	A	C19	5	Private	Open	Chalk	UN	SU772817
SO190	Kidmore End	Cane End		Well	A	C19	5	Local Authority	Intermediate	Chalk	UN	SU679795
SO191	Mapledurham	Tinkers Green		Well	A	C20	5	Local Authority	Closed	Chalk	UN	SU689781
SO192	Mapledurham	Noke Green		Well	A	C19	5	Local Authority	Closed	Chalk	UN	SU688767
SO193	Mapledurham	Trench Green		Pump	A	PM	5	Private	Closed	Chalk	UN	SU685777
SO194	Checkendon	Neals Farm	Boroughcourt Hospital	Well	A	C20	5	National/ Regional	Intermediate	Chalk	UN	SU685828
SO195	Didcot	Railway centre		Water Tower	C	C19	2	National/ Regional	Open	Sand	UN	SU525907
SO196	Cholsey	Cholsey Hill		Pump House	A	C20	5	Private	Open	Chalk	UN	SU572883
SO197	Crowmarsh	Mongewell		Residential	G	C19	3	Private	Intermediate	Chalk	UN	SU614876
SO198	Nuneham Courtenay	Nuneham Park		Pond	A	C18	4	Private	Closed	Clay	UN	SU546985
SO199	Nuneham Courtenay			Residential	G	C18	1	Private	Closed	Clay	UN	SU553993
SO200	Thame			Sewage Works	F	C19	1	National/ Regional	Open	Clay	UN	SP711066
SO201	Woodcote			Well	A	C19	5	Local Authority	Intermediate	Chalk	UN	SU646813
SO202	Woodeaton			Tap	A	C19	3	Local Authority	Closed	Clay	UN	SP535119
SO203	Culham	Kiln Cottage, Tollgate Road		Pump	A	PM	3	Private	Closed	Clay	UN	SP509500

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Catalogue of Sites in Vale of White Horse District

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish type	Geology	Designation	Grid Ref
VW001	Abingdon	Albert Park, Abingdon	Abingdon Conduit	Conduit	A	C16	3	Local Authority	Open	Clay	LB	SU492973
VW002	Abingdon	Conduit Road, Abingdon	Carswell or Ely's Conduit	Well	A	PM	3	Local Authority	Open	Clay	LB	SU493970
VW003	East Hendred	High Street, East Hendred		Pump	A	C19	3	Local Authority	Open	Sand	UN	SU460886
VW004	East Hendred	SParks Farm, High Street, East Hendred		Well	A	C19	2	Private	Open	Sand	UN	SU461888

Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish type	Geology	Designation	Grid Ref
VW005	Wantage	Eagles Close Almshouses, Post Office Lane, Wantage	Eagles Close Almshouses Well	Well	A	C19	2	Private	Open	Sand	LB	SU400878
VW006	Wantage	Manor Road, Wantage		Waterworks	B	C19	5	National/Regional	Open	Sand	UN	SU396868
VW007	Blewbury	Watts Lane, Blewbury	Watts Spring	Spring	A	UN	3	Local Authority	Open	Chalk	UN	SU531857
VW008	Blewbury	Parsonage Farm, Blewbury		Well	A	UN	2	Private	Open	Chalk	UN	SU532858
VW009	Blewbury	Orchard Dene Cottage, Blewbury		Well	A	UN	1	Private	Open	Chalk	UN	SU534859
VW010	Blewbury	The Cleeve, Blewbury		Spring	A	UN	4	Local Authority	Open	Chalk	UN	SU531857
VW011	Buckland	New Row, Buckland Road, Buckland		Well	A	C19	2	Private	Open	Limestone	LB	SU343978
VW012	Ashbury	Cress Cottage, Station Road, Ashbury		Pump	A	C19	3	Private	Closed	Sand	UN	SU262853
VW013	Ashbury	Ashbury Hill, Ashbury		Reservoir	C	C19	3	Private	Closed	Sand	UN	SU266851
VW014	Bourton	The Hill, Bourton		Pump	A	C19	2	Local Authority	Closed	Clay	UN	SU233870
VW015	Drayton	High Street, Drayton		Pump	A	C19	3	Local Authority	Open	Clay	LB	SU482941
VW016	Sutton Courtenay	Church Street, Sutton Courtenay		Pump	A	C19	3	Private	Open	Clay	UN	SU501194

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish type	Geology	Designation	Grid Ref
VW017	Appleton-with-Eaton	Badswell Lane, Appleton	Badwell	Well	A	MED	2	Local Authority	Open	Limestone	UN	SP436015
VW018	Cumnor	Leys Road, Bablock Hythe	Physic Well	Holy Well	A	C17	4	Private	Open	Limestone	HER	SP441044
VW019	Appleton-with-Eaton	The Eight Bells, Bablock Hythe Road, Eaton		Well	A	C19	2	Private	Open	Limestone	UN	SP448032
VW020	North Hinksey	Well House, The Fold, Harcourt Hill, North Hinksey	North Hinksey Conduit House	Conduit	A	C17	2	National/Regional	Open	Clay	SM	SP495050
VW021	East Challow	Main Street, East Challow		Pump	A	C19	3	Local Authority	Open	Sand	LB	SU380882
VW022	Denchworth	Hyde Road, Denchworth		Pump	A	C19	2	Local Authority	Open	Clay	LB	SU382919
VW023	Great Faringdon	Market Place, Faringdon	Port well	Well Head	A	C18	4	Local Authority	Closed	Limestone	LB	SU289956
VW024	Shrivenham	Highworth Road, Shrivenham		Pump	A	C19	2	Local Authority	Closed	Clay	UN	SU241889
VW025	Buscot	The Street, Buscot		Well	A	C19	3	Local Authority	Closed	Clay	LB	SU231975
VW026	Watchfield	Little Wellington Rd, Watchfield		Well House	A	RO	5	Private	Intermediate	Clay	HER	SU255902
VW027	Wantage	N side Locks Lane, Wantage	Alfred's Well	Well	A	UN	UN	Local Authority	Open	Sand	HER	SU393879
VW028	Buckland	Buckland Park		Water Tower	C	C20	UN	Private	Open	Limestone	HER	SU336983
VW029	Sunningwell	Sunningwell	Sunning Well	Pond	A	MED	2	Local Authority	Closed	Clay	NMR	SP496006

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish type	Geology	Designation	Grid Ref
VW030	Besselsleigh	Besselsleigh Manor, Besselsleigh		Well	A	UN	UN	Private	Closed	Limestone	HER	SP455011
VW031	Kingston Bagpuize with Southmoor	Kingston Bagpuize with Southmoor	Spa Well	Well	A	PM	5	Private	Intermediate	Limestone	HER	SU395980
VW032	Chilton	Malt Cottage, Chilton		Well	A	PM	UN	Private	Open	Chalk	HER	SU489856
VW033	Buscot	Buscot Park, Buscot		Reservoir	C	C19	1	Private	Closed	Clay	NMR	SU245967
VW034	Little Coxwell	Little Coxwell	Old Cock Well	Well	A	UN	UN	Private	Open	Sand	NMR	SU278931
VW035	Hinton Waldrist	Hinton Manor, Hinton Waldrist		Fountain	A	C18	UN	Private	Open	Limestone	LB	SU375992
VW036	Fernham	Fernham		Pump	A	PM	3	Local Authority	Closed	Sand	HER	SU293919
VW037	Cumnor	Swinford		Waterworks	B	C20	UN	National/Regional	Open	Clay	HER	SP445085
VW038	Cumnor	Farmoor	Farmoor Reservoirs	Reservoir	C	C20	1	National/Regional	Open	Clay	HER	SP446062
VW039	Uffington			Pump	A	C19	2	Private	Intermediate	Sand	UN	SU302893
VW040	Great Coxwell			Pump	A	C19	3	Local Authority	Closed	Limestone	UN	SU269935
VW041	Coleshill			Well	A	C19	5	Private	Closed	Limestone	UN	SU235937
VW042	Wantage	Belmont		Water Tower	C	C20	5	Private	Open	Sand	UN	SU389884
VW043	Wantage	St Mary's Convent		Water Tower	C	C20	5	Private	Open	Sand	UN	SU393883
VW044	Milton	Featherbed Lane, Milton Hill		Water Tower	C	C20	3	Private	Closed	Sand	UN	SU475905

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish type	Geology	Designation	Grid Ref
VW045	Wantage	Factory site		Water Tower	C	C20	5	Private	Open	Sand	UN	SU399888
VW046	Watchfield			Bath	E	C18	5	Private	Intermediate	Limestone	UN	SU235905
VW047	Upton		Hagbourne Hill Reservoir	Reservoir	C	C20	1	National/Regional	Intermediate	Chalk	UN	SU501868
VW048	Cumnor	Beacon Hill	Beacon Hill Reservoir	Reservoir	C	C20	1	National/Regional	Open	Clay	UN	SP449080
VW049	Steventon			Reservoir	C	C20	1	National/Regional	Open	Sand	UN	SU474910
VW050	Drayton	Sutton Wick Lane, Drayton		Pump	A	C19	3	Local Authority	Open	Clay	LB	SU480947
VW051	Longworth	Longworth Manor		Water Tower	C	C20	UN	Private	Closed	Limestone	LB	SU383994
VW052	Baulking	The Green		Pump	A	C19	UN	Local Authority	Closed	Clay	LB	SU318913
VW053	Baulking	Spencer's Farmhouse, The Green		Pump	A	C19	UN	Private	Closed	Clay	LB	SU317913
VW054	Shrivenham	Elm Tree House, High Street		Pump	A	C19	UN	Private	Closed	Clay	LB	SU240890
VW055	Abingdon	Market House		Pump	A	C20	2	Local Authority	Open	Clay	LB	SU498971
VW056	Abingdon	Abbey Meadow		Swimming Pool	D	C20	1	Local Authority	Open	Clay	NMR	SU501970
VW057	Abingdon		Old Free School	Fountain	A	PM	4	Private	Open	Clay	UN	SU498970
VW058	Watchfield	Strattenborough Castle Farm		Pump	A	C19	UN	National/Regional	Intermediate	Limestone	UN	SU237921
VW059	Childrey			Pond	A	UN	2	Local Authority	Open	Sand	UN	SU362875
VW060	Wootton	Boars Hill		Reservoir	C	C20	1	National/Regional	Open	Limestone	UN	SP484030
VW061	Cumnor			Pond	A	UN	2	Local Authority	Open	Limestone	UN	SP460042

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish type	Geology	Designation	Grid Ref
VW062	Little Coxwell			Pond	A	UN	2	Local Authority	Open	Sand	UN	SU282934
VW063	Drayton			Pond	A	UN	2	Local Authority	Open	Clay	UN	SU479947
VW064	Lyford			Pond	A	UN	2	Local Authority	Intermediate	Clay	UN	SU392944
VW065	Great Faringdon	Faringdon House		Swimming Pool	D	PM	UN	Private	Closed	Limestone	UN	SU287958
VW066	Coleshill		Coleshill	Park	D	C19	3	Private	Closed	Limestone	HER	SU240935
VW067	Eaton Hastings		Buscot Park	Park	D	C18	1	Private	Closed	Clay	RPG	SU252967
VW068	Ardington	Village Hall		Bath	E	C19	5	Private	Closed	Sand	UN	SU432884
VW069	Lockinge	Larkhill		Reservoir	C	C20	1	National/Regional	Closed	Sand	UN	SU410873
VW070	Letcombe Regis			Reservoir	C	C20	1	National/Regional	Open	Chalk	UN	SU361855
VW071	Chilton			Pump	A	PM	3	Local Authority	Open	Chalk	UN	SU490858
VW072	Longcot			Pump	A	PM	UN	Local Authority	Intermediate	Clay	UN	SU273909
VW073	Blewbury	Church Street	Plenty's Well	Well	A	UN	UN	Private	Open	Chalk	UN	SU532858
VW074	Lyford		Lyford almshouses	Pump	A	PM	UN	Private	Intermediate	Clay	UN	SU392943
VW075	Sunningwell	The Flowing Well		Well	A	PM	3	Private	Closed	Clay	UN	SP497006
VW076	West Hendred	Off Ginge Road		Pump House	A	C20	UN	Private	Closed	Sand	UN	SU450876
VW077	West Hendred	Park Hill		Reservoir	C	C20	1	National/Regional	Closed	Sand	UN	SU453880
VW078	Lockinge	Chalk Hill		Reservoir	C	C19	1	National/Regional	Closed	Sand	UN	SU430855
VW079	Lockinge	Chain Hill		Reservoir	C	C20	2	National/Regional	Closed	Sand	UN	SU405871

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish type	Geology	Designation	Grid Ref
VW080	Great Faringdon	Lechlade Road		Swimming Pool	D	C20	5	Local Authority	Closed	Limestone	UN	SU286956
VW081	Buscot	Buscot House		Swimming Pool	D	C20	UN	Private	Closed	Clay	UN	SU243968
VW082	Great Faringdon	Market Place		Tank	C	C20	5	Local Authority	Closed	Limestone	UN	SU289956
VW083	Coleshill	Coleshill Estate		Pump	A	C19	3	Private	Closed	Limestone	UN	SU239938
VW084	North Hinksey	North Hinksey allotments		Well	A	C21	1	Private	Open	Limestone	UN	SP480061
VW085	Abingdon	Abingdon Bridge		Pump House	A	C17	5	Local Authority	Open	Clay	UN	SU499969
VW086	Abingdon	Stert Street		Conduit	A	C17	5	Local Authority	Open	Clay	UN	SU498972
VW087	Sutton Courtenay	All Saints Lane		Pumping station	B	C20	5	National/Regional	Open	Clay	UN	SU506941
VW088	Wootton			Waterworks	B	C19	5	Local Authority	Open	Clay	UN	SP482005
VW089	Buscot	Eaton Weir		Pump House	A	C19	UN	Private	Closed	Clay	UN	SU247985
VW090	Buscot	Buscot Lock		Pump House	A	C19	5	Private	Closed	Clay	UN	SU230980
VW091	Buscot	Buscot Park	Lake and Little Lake	Reservoir	C	C18	UN	Private	Closed	Clay	UN	SU249969
VW092	Buscot	Buscot Park		Reservoir	C	C19	UN	Private	Closed	Clay	UN	SU249969
VW093	Buscot	Buscot Park		Pump House	A	C19	UN	Private	Closed	Clay	UN	SU242973
VW094	Buscot	Buscot Park		Waterworks	B	C19	UN	Private	Closed	Clay	UN	SU238968
VW095	Wytham	Godstow Abbey		Conduit	A	MED	5	Private	Closed	Limestone	UN	SP477088
VW096	Coleshill	Coleshill Park		Reservoir	C	C18	4	Private	Closed	Limestone	UN	SU240938
VW097	Coleshill			Pump	A	C19	5	Local Authority	Closed	Limestone	UN	SU235936
VW098	Coleshill	School Lane		Pump	A	C19	5	Local Authority	Closed	Limestone	UN	SU238939

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish type	Geology	Designation	Grid Ref
VW099	Coleshill	Church Lane		Pump	A	C19	5	Local Authority	Closed	Limestone	UN	SU235938
VW100	Coleshill	Middleleaze Farm		Pump House	A	C19	UN	Private	Closed	Clay	UN	SU246949
VW101	Abingdon	Albert Park		Drain	F	PM	5	Private	Open	Clay	UN	SU491973
VW102	Abingdon	Abbey Meadows		Park	D	C20	1	Local Authority	Open	Clay	UN	SU503971
VW103	Abingdon		Abbey Mill Stream	Stream	G	MED	3	National/Regional	Open	Clay	UN	SU502971
VW104	Buscot	Oldfield Farm		Reservoir	C	C19	2	Private	Closed	Clay	UN	SU249961
VW105	Buscot	Oldfield Farm		Turbine	G	C19	5	Private	Closed	Clay	UN	SU251960
VW106	North Hinksey			Conduit	A	MED	5	Private	Open	Clay	UN	SP492052
VW107	North Hinksey			Conduit	A	MED	5	Private	Open	Clay	UN	SP495049
VW108	North Hinksey			Water Tower	C	C20	5	National/Regional	Open	Clay	UN	SP492050
VW109	Wantage	Nalderstown		Residential	G	C19	1	Private	Open	Sand	UN	SU391881
VW110	Wantage	Stiles Almshouses		Residential	G	PM	UN	Private	Open	Sand	LB	SU398876
VW111	Coleshill			Pump	A	C19	5	Local Authority	Closed	Limestone	UN	SU236937
VW112	Little Coxwell			Pump	A	C19	3	Local Authority	Open	Sand	UN	SU283908

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO001	Charlbury	Playing Close, Charlbury	Kibble Fountain	Fountain	A	C19	3	Local Authority	Open	Limestone	LB	SP358195
WO002	Asthall	Fordwells		Trough	A	C19	1	Local Authority	Intermediate	Limestone	UN	SP309138
WO003	Tackley	Old Whitehill Farm, Tackley		Pump	A	C19	5	Private	Intermediate	Limestone	UN	SP483197
WO004	Blenheim	Blenheim Palace, Blenheim		Tank	C	C18	5	Private	Closed	Limestone	LB	SP442162
WO005	Blenheim	Blenheim Palace, Blenheim	Grand Bridge	Pump House	A	C18	5	Private	Closed	Limestone	LB	SP439165
WO006	Blenheim	Blenheim Park, Blenheim	Fair Rosamund's Well	Spring	A	C12	2	Private	Closed	Limestone	NMR	SP436165
WO007	Blenheim	Blenheim Park, Blenheim		Reservoir	C	C19	3	Private	Closed	Limestone	UN	SP431157
WO008	Combe	Stonesfield Road, Combe		Trough	A	UN	3	Local Authority	Closed	Limestone	UN	SP412158
WO009	Combe	Church Walk, Combe		Pump	A	C19	2	Local Authority	Closed	Limestone	UN	SP414159
WO010	Stonesfield	Woodstock Road, Stonesfield		Pump	A	C19	2	Local Authority	Open	Limestone	UN	SP395172
WO011	Charlbury	Cornbury Park, Grammar School Hill, Charlbury	Baywell	Well	A	PM	5	Private	Open	Limestone	UN	SP358189
WO012	Enstone	Bicester Road, Church Enstone		Fountain	A	C19	3	Local Authority	Intermediate	Limestone	UN	SP378247

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO013	Witney	Worsham	Worsham Waterworks	Waterworks	B	C20	4	Private	Open	Limestone	UN	SP301106
WO014	Little Tew	Manor Farm, Enstone Road, Little Tew		Well	A	UN	4	Private	Intermediate	Limestone	UN	SP383283
WO015	Sandford St Martin	Ledwell		Pump	A	C19	2	Local Authority	Intermediate	Limestone	HER	SP420282
WO016	Over Norton	The Green, Over Norton	Dawkins Fountain	Fountain	A	C19	2	Local Authority	Closed	Limestone	LB	SP317283
WO017	Churchill	Churchill	Langston Memorial Fountain	Fountain	A	C19	1	Local Authority	Closed	Limestone	LB	SP283243
WO018	Spelsbury	Taston Road, Spelsbury	Dillon Fountain	Fountain	A	C19	2	Local Authority	Intermediate	Limestone	UN	SP350217
WO019	Shipton-under-Wychwood	The Green, High Street, Shipton-under-Wychwood		Fountain	A	C19	2	Local Authority	Intermediate	Limestone	LB	SP279179
WO020	Bladon	Park Street, Bladon		Pump	A	C19	2	Local Authority	Open	Limestone	LB	SP448149
WO021	Tackley	15 Medcroft Road, Tackley		Well	A	UN	4	Private	Intermediate	Limestone	UN	SP480208
WO022	Tackley	Rousham Road, Tackley		Reservoir	C	C19	5	Private	Intermediate	Limestone	UN	SP478215
WO023	Rousham	Rousham Village		Pump	A	C19	2	Private	Closed	Limestone	LB	SP481240
WO024	Asthall	Fordwells		Spring	A	UN	2	Local Authority	Intermediate	Limestone	UN	SP309138
WO025	Asthall	Fordwells		Tank	C	C19	2	Private	Intermediate	Limestone	UN	SP386138

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO026	Stonesfield	Prospect Villa, Combe Road, Stonesfield		Well	A	UN	2	Private	Open	Limestone	UN	SP395172
WO027	Little Tew	Main Street, Little Tew		Well	A	UN	3	Local Authority	Intermediate	Limestone	UN	SP386286
WO028	Rousham	Rousham Village		Tap	A	UN	3	Private	Closed	Limestone	UN	SP482239
WO029	Kingham	Kingham		Well	A	PM	UN	Private	Intermediate	Limestone		SP268255
WO030	Curbridge	Curbridge		Well	A	MED	UN	Unknown	Intermediate	Limestone	NMR	SP318088
WO031	Glympton	Glympton		Pump House	A	PM	4	Private	Closed	Limestone	UN	SP425207
WO032	Eynsham	Eynsham		Waterworks	B	PM	5	Local Authority	Closed	Clay	UN	SP441100
WO033	Spelsbury	Spelsbury	Spurnell's Well	Well	A	UN	UN	Private	Intermediate	Limestone	NMR	SP392201
WO034	Eynsham	Eynsham		Well House	A	PM	UN	Private	Closed	Clay		SP396125
WO035	Kiddington with Asterleigh	Kiddington		Well House	A	C19	UN	Private	Closed	Limestone	UN	SP411223
WO036	Blenheim	Blenheim Palace, Blenheim		Pumping Station	B	C19	UN	Private	Closed	Limestone	UN	SP437152
WO037	Blenheim	Blenheim Park, Blenheim	Mapleton Well	Well	A	MED	UN	Private	Closed	Limestone	NMR	SP418174
WO038	Sandford St Martin	Ledwell	Ledwell	Well	A	UN	1	Local Authority	Intermediate	Limestone	HER	SP420282
WO039	Kingham	Kingham	Stocks Well	Well	A	PM	UN	Local Authority	Intermediate	Limestone		SP261241
WO040	North Leigh	Wilcote Grange		Pump	A	PM	UN	Private	Closed	Limestone	UN	SP384159

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO041	Asthall	Manor Farm, Asthall		Pump House	A	PM	2	Private	Intermediate	Limestone	UN	SP287114
WO042	Enstone	Enstone	Gold Well or Bushell's well	Spring	A	C17	5	Private	Intermediate	Limestone	HER	SP376246
WO043	North Leigh	Wilcote	Ladywell	Well	A	MED	UN	Private	Closed	Limestone	UN	SP374148
WO044	Sarsden	Sarsden House		Water Tower	C	C19	UN	Private	Closed	Limestone		SP290232
WO045	Sandford St Martin	Sandford St Martin	Holy Well	Well	A	UN	5	Private	Intermediate	Limestone	UN	SP422267
WO046	Witney	Witney		Well	A	UN	5	Local Authority	Open	Limestone		SP356096
WO047	Kiddington with Asterleigh	Kiddington Park		Pump House	A	PM	UN	Private	Closed	Limestone	LB	SP411229
WO048	Swinbrook and Widford	Swinbrook and Widford		Well	A	PM	UN	Private	Closed	Limestone	UN	SP273117
WO049	Brize Norton	Brize Norton		Well House	A	PM	UN	Private	Intermediate	Limestone	HER	SP306082
WO050	Enstone	Enstone	Jacob's Well	Well	A	UN	UN	Unknown	Intermediate	Limestone	HER	SP385264
WO051	Bruern	Tangley House		Well House	A	C17	UN	Private	Closed	Limestone	LB	SP235169
WO052	Chipping Norton		Hitchman's Brewery	Mineral Water Factory	G	C20	5	Private	Closed	Limestone	UN	SP315268
WO053	Blenheim	Blenheim Palace, Blenheim	Bernini Fountain	Fountain	A	C18	1	Private	Closed	Limestone	LB	SP440160
WO054	Holwell	Manor Farmhouse, Holwell		Pump	A	C19	UN	Private	Closed	Limestone	LB	SP233091

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO055	Enstone	Church Street, Church Enstone		Pump	A	C19	UN	Local Authority	Intermediate	Limestone	LB	SP360250
WO056	Rousham	Rousham Park, Rousham		Bath	E	C18	2	Private	Closed	Limestone	LB	SP478245
WO057	Great Tew	53 The Square, Great Tew		Pump	A	C19	UN	Private	Closed	Limestone	LB	SP398293
WO058	Spelsbury	Taston		Fountain	A	PM	2	Local Authority	Intermediate	Limestone	LB	SP360220
WO059	Fulbrook	Manor Farmhouse, Westhall Hill		Pond	A	C17	UN	Private	Intermediate	Limestone	LB	SP250120
WO060	Alvescot			Well	A	UN	UN	Private	Intermediate	Limestone	HER	SP275049
WO061	Swinbrook and Widford			Pump	A	PM	UN	Private	Closed	Limestone	UN	SP282128
WO062	Witney	Witney	Water tower	Water tower	C	C20	5	Local Authority	Open	Limestone	UN	SP345102
WO063	Witney	Cogges		Pump	A	PM	UN	Private	Open	Clay	UN	SP377078
WO064	Witney	Cogges		Pump	A	PM	UN	Private	Open	Limestone	HER	SP360096
WO065	Stonesfield		Ruddy Well	Reservoir	C	PM	5	Local Authority	Open	Limestone		SP392174
WO066	Cornbury and Wychwood		Spa Well	Holy Well	A	MED	UN	Private	Closed	Limestone	UN	SP347173
WO067	Stonesfield		Ruddy Well	Tap	A	PM	UN	Local Authority	Open	Limestone		SP393184
WO068	Swinbrook and Widford	South Lawn.		Reservoir	C	PM	UN	Private	Closed	Limestone	UN	SP284123
WO069	Alvescot			Well	A	PM	UN	Private	Intermediate	Limestone	HER	SP274038
WO070	Swinbrook and Widford	South Lawn.		Pump	A	PM	UN	Private	Closed	Limestone	UN	SP285144

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO071	Witney	Near Apley Barn	Water Works and Pumping Station	Waterworks	B	C20	4	Local Authority	Open	Limestone	UN	SP344106
WO072	Alvescot			Well	A	PM	UN	Private	Intermediate	Limestone	HER	SP271046
WO073	Ducklington			Pond	A	UN	2	Local Authority	Closed	Clay	UN	SP359076
WO074	Alvescot			Well	A	UN	UN	Unknown	Intermediate	Limestone	HER	SP271041
WO075	Eynsham			Water Tower	C	C19	5	Local Authority	Closed	Clay	HER	SP433097
WO076	Alvescot			Well	A	PM	UN	Unknown	Intermediate	Clay	HER	SP262032
WO077	Kingham	Kingham	Holwell Spring	Well	A	MED	UN	Local Authority	Intermediate	Limestone		SP273255
WO078	Eynsham		Abbey Well	Well	A	MED	5	Private	Closed	Clay	UN	SP434091
WO079	Ascott-under-Wychwood		Cold Well	Well	A	PM	UN	Unknown	Closed	Limestone	UN	SP299173
WO080	Asthall		Holy Well	Well	A	PM	UN	Unknown	Intermediate	Limestone	UN	SP294124
WO081	Asthall		Pinna's Spring	Spring	A	MED	UN	Unknown	Intermediate	Limestone	UN	SP297105
WO082	Aston, Cote, Shifford and Chimney	Aston Bampton	Holy Well	Well	A	MED	UN	Unknown	Closed	Clay	UN	SP358026
WO083	Bampton		Lady Well	Well	A	MED	UN	Private	Intermediate	Clay	UN	SP309302
WO084	Blenheim		New Found Well	Spring	A	UN	UN	Private	Closed	Limestone	UN	SP438151
WO085	Cassington		Pear Tree Well	Well	A	PM	UN	Unknown	Intermediate	Clay	UN	SP443120
WO086	Chipping Norton	Albion Street	Hitchman's Brewery	well	A	C19	5	Private	Closed	Limestone	UN	SP314269
WO087	Churchill		Churchill Mill Spring	Spring	A	PM	UN	Private	Closed	Limestone	UN	SP277246

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO088	Cornbury and Wychwood		Cyder Well	Holy Well	A	MED	UN	Private	Closed	Limestone	UN	SP336171
WO089	Cornbury and Wychwood		Wort Well	Holy Well	A	MED	UN	Private	Closed	Clay	UN	SP334167
WO090	Cornbury and Wychwood			Water Tower	C	C20	4	Private	Closed	Limestone	UN	SP352163
WO091	Cornwell		Crane's Well	Well	A	MED	UN	Unknown	Closed	Limestone	UN	SP269271
WO092	Crawley		Showel Spring	Spring	A	PM	UN	Unknown	Closed	Limestone	UN	SP342133
WO093	Curbridge		Ashmore Well	Well	A	PM	5	Unknown	Intermediate	Limestone	UN	SP326073
WO094	Curbridge		Coral Spring	Spring	A	PM	UN	Unknown	Intermediate	Limestone	UN	SP339089
WO095	Curbridge		Kettle Well	Holy Well	A	MED	UN	Unknown	Intermediate	Limestone	UN	SP318088
WO096	Ducklington		Cooper's Well	Holy Well	A	MED	UN	Unknown	Closed	Clay	UN	SP354073
WO097	Enstone		Gagingwell	Holy Well	A	PM	UN	Unknown	Intermediate	Limestone	UN	SP408251
WO098	Enstone		Holy Well	Well	A	MED	UN	Unknown	Intermediate	Limestone	UN	SP378255
WO099	Finstock			Water Tower	C	PM	UN	Unknown	Closed	Limestone	UN	SP359165
WO100	Finstock			Well	A	PM	4	Local Authority	Closed	Limestone	UN	SP362162
WO101	Great Tew		Holy Well	Holy Well	A	MED	UN	Unknown	Closed	Limestone	UN	SP388296
WO102	Hanborough	Church Hanborough	Wottmell Well	Holy Well	A	MED	5	Unknown	Closed	Clay	UN	SP427130
WO103	Hanborough	Church Hanborough	Holy Well	Holy Well	A	MED	UN	Unknown	Closed	Clay	UN	SP425126
WO104	Holwell		Holy Well	Holy Well	A	MED	5	Unknown	Closed	Limestone	UN	SP232091
WO105	Kencot		Bed Well	Holy Well	A	MED	UN	Unknown	Closed	Limestone	UN	SP262043
WO106	Kiddington with Asterleigh		Wood Well	Holy Well	A	MED	UN	Unknown	Closed	Limestone	UN	SP409198

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO107	Kiddington with Asterleigh		MoorLake Spring	Spring	A	UN	UN	Unknown	Closed	Limestone	UN	SP409231
WO108	Little Tew		Cherwell Spring	Spring	A	UN	UN	Unknown	Intermediate	Limestone	UN	SP370299
WO109	Little Tew		Seven Wells	Holy Well	A	MED	UN	Unknown	Intermediate	Limestone	UN	SP356291
WO110	Minster Lovell		Lady Well	Holy Well	A	PM	UN	Unknown	Intermediate	Limestone	UN	SP327116
WO111	North Leigh		Madley Well	Holy Well	A	MED	UN	Unknown	Closed	Clay	UN	SP385121
WO112	Rollright	Great Rollright	Lady Well	Holy Well	A	MED	UN	Unknown	Closed	Limestone	UN	SP328314
WO113	Rousham		St German's Well	Holy Well	A	MED	UN	Unknown	Closed	Limestone	UN	SP470241
WO114	Shipton-under-Wychwood		Trot's Spout	Spring	A	UN	UN	Unknown	Intermediate	Limestone	UN	SP278172
WO115	Spelsbury		Cirver Wells	Holy Well	A	PM	UN	Private	Intermediate	Limestone	UN	SP342221
WO116	Spelsbury		Tenants' Well	Holy Well	A	UN	5	Unknown	Intermediate	Limestone	UN	SP359221
WO117	Spelsbury		Holy Well	Holy Well	A	UN	UN	Unknown	Intermediate	Limestone	UN	SP348215
WO118	Stanton Harcourt		Lady Alice's Pond	Pond	A	UN	UN	Private	Closed	Clay	UN	SP416055
WO119	Steeple Barton		Seven Wells	Holy Well	A	MED	5	Unknown	Intermediate	Limestone	UN	SP448252
WO120	Swerford		Digger's Well	Holy Well	A	MED	UN	Unknown	Closed	Limestone	UN	SP377314
WO121	Westwell		West Well	Holy Well	A	MED	UN	Unknown	Closed	Limestone	UN	SP222099
WO122	Wootton		Slut's Well	Well	A	PM	3	Local Authority	Intermediate	Limestone	UN	SP439203
WO123	Bampton	Near gas works		Water Tower	C	PM	5	Unknown	Intermediate	Clay	UN	SP323032
WO124	Fawler	Fawler Lane		Pump House	A	C20	4	Private	Closed	Limestone	UN	SP367174

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO125	Chipping Norton			Water Tower	C	PM	1	National/ Regional	Closed	Limestone	UN	SP319270
WO126	Charlbury	Conygree Farm		Well House	A	PM	UN	Private	Open	Limestone	UN	SP359213
WO127	Little Tew	Dunthrop		Water Tower	C	PM	4	Unknown	Intermediate	Limestone	UN	SP356294
WO128	North Leigh	Perrots Hill		Water Tower	C	PM	UN	Unknown	Closed	Clay	UN	SP396132
WO129	Shilton	Little Kilkenny		Water tower	C	PM	UN	Unknown	Closed	Limestone	UN	SP282091
WO130	Enstone	Gagingwell		Spring	A	UN	UN	Unknown	Intermediate	Limestone	UN	SP408251
WO131	Blenheim	Italian Garden		Fountain	A	C20	1	Private	Closed	Limestone	LB	SP442161
WO132	Blenheim	Water Terrace Gardens - west terrace		Fountain	A	C20	1	Private	Closed	Limestone	LB	SP440160
WO133	Kelmscott	Kelmscott Manor		Latrine	F	C19	UN	Private	Intermediate	Clay	LB	SP251989
WO134	Kencot	Kencot Cottage		Pump	A	C19	UN	Private	Closed	Limestone	LB	SP255048
WO135	Spelsbury	Ditchley Park		Lake	D	C18	UN	Private	Intermediate	Limestone	LB	SP385213
WO136	Woodstock	Woodstock Town Hall		Fountain	A	C19	UN	Local Authority	Intermediate	Limestone	LB	SP445167
WO137	Ramsden	Lower Farmhouse, High Street		Latrine	F	C18	UN	Private	Closed	Limestone	LB	SP360149
WO138	Heythrop	Heythrop Park		Bath	E	C18	UN	Private	Closed	Limestone	LB	SP363261
WO139	Hardwick-with-Yelford	Fish House		Pump House	A	C19	UN	Private	Intermediate	Clay	LB	SP373068
WO140	Little Faringdon			Pump	A	C19	UN	Private	Intermediate	Clay	UN	SP223013

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO141	Kingham	West End		Pump	A	C19	UN	Private	Intermediate	Limestone		SP257241
WO142	Shipton-under-Wychwood	Shipton Court		Swimming Pool	D	C20	1	Private	Intermediate	Limestone	LB	SP278175
WO143	Stonesfield	The Follies, Pond Hill		Well	A	PM	UN	Private	Open	Limestone		SP394173
WO144	Heythrop	Heythrop Park		Pump House	A	C18	UN	Private	Closed	Limestone	HER	SP371268
WO145	Heythrop	Heythrop Park		Pump House	A	C18	UN	Private	Closed	Limestone	UN	SP358265
WO146	Heythrop	Heythrop Park		Pump House	A	C18	UN	Private	Closed	Limestone	UN	SP373260
WO147	Heythrop	Heythrop Park		Pump House	A	C18	UN	Private	Closed	Limestone	UN	SP360265
WO148	Steeple Barton			Pump	A	PM	5	Private	Intermediate	Limestone	UN	SP455236
WO149	Spelsbury	Ditchley Park		Swimming Pool	D	PM	2	Private	Intermediate	Limestone	UN	SP389211
WO150	Woodstock			Swimming Pool	D	C20	1	Local Authority	Intermediate	Limestone	NMR	SP456169
WO151	Chipping Norton	Albion Tavern, Burford Road		Waterworks	B	C19	UN	Private	Closed	Limestone	UN	SP316264
WO152	Shipton-under-Wychwood		Shipton Court	Park	D	C20	1	Private	Intermediate	Limestone	RPG	SP276175
WO153	Eynsham	Mill Lane		Well	A	C19	5	Private	Closed	Clay	UN	SP432096
WO154	Tackley		Tackley Water Garden	Park	D	C17	2	Private	Intermediate	Limestone	RPG	SP481205

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO155	Kiddington with Asterleigh		Kiddington Hall	Park	D	C18	1	Private	Closed	Limestone	RPG	SP410229
WO156	Cornbury and Wychwood		Cornbury Park	Park	D	C17	1	Private	Closed	Limestone	RPG	SP347181
WO157	Rousham		Rousham	Park	D	C18	1	Private	Closed	Limestone	RPG	SP477242
WO158	Heythrop		Heythrop Park	Park	D	C18	1	Private	Closed	Limestone	RPG	SP356270
WO159	Spelsbury		Ditchley Park	Park	D	C18	1	Private	Intermediate	Limestone	RPG	SP391211
WO160	Blenheim		Blenheim Palace	Park	D	C18	1	Private	Closed	Limestone	RPG	SP435166
WO161	Glympton		Glympton Park	Park	D	C18	1	Private	Closed	Limestone	HER	SP421217
WO162	Carterton			Swimming Pool	D	C20	5	Local Authority	Closed	Limestone	NMR	SP278083
WO163	Filkins and Broughton Poggs	Filkins		Swimming Pool	D	C20	1	Local Authority	Closed	Limestone	NMR	SP238043
WO164	Chipping Norton	Town Hall		Tap	A	PM	5	Local Authority	Closed	Limestone	UN	SP313271
WO165	Chipping Norton	New Street		Tap	A	C19	5	Local Authority	Closed	Limestone	UN	SP313271
WO166	Blenheim			Bath	E	C18	UN	Private	Closed	Limestone	UN	SP441161
WO167	Shilton	Bridge Street		Pump	A	PM	UN	Local Authority	Closed	Limestone	UN	SP267085
WO168	Shilton	Bridge Street		Pump	A	PM	UN	Local Authority	Closed	Limestone	UN	SP267085
WO169	Alvescot	Main Street		Pump	A	C19	UN	Local Authority	Intermediate	Limestone	UN	SP272045
WO170	Bampton	Deanery Farm, Station Road		Pump	A	C20	UN	Private	Intermediate	Clay	UN	SP312033

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO171	Charlbury	Bull Inn, Sheep Street		Pump	A	C19	2	Private	Open	Limestone	UN	SP358195
WO172	Hanborough			Pump	A	C19	UN	Unknown	Closed	Clay	UN	SP419141
WO173	Woodstock	The Causeway		Pump	A	C19	UN	Local Authority	Intermediate	Limestone	UN	SP442169
WO174	Carterton	RAF Brize Norton		Water Tower	C	C20	2	Private	Closed	Limestone	UN	SP288065
WO175	Stanton Harcourt	RAF Stanton Harcourt		Water Tower	C	C20	2	National/ Regional	Closed	Clay	UN	SP415056
WO176	Stanton Harcourt	RAF Stanton Harcourt		Water Tower	C	C20	3	National/ Regional	Closed	Clay	UN	SP415054
WO177	Stanton Harcourt	RAF Stanton Harcourt		Pump House	A	C20	3	National/ Regional	Closed	Clay	UN	SP415053
WO178	Chipping Norton		The Lido	Swimming Pool	D	C20	1	Local Authority	Closed	Limestone	UN	SP316266
WO179	Burford			Waterworks	B	PM	UN	Local Authority	Open	Limestone	UN	SP251125
WO180	Great Tew			Trough	A	C19	UN	Private	Closed	Limestone	UN	SP396293
WO181	Great Tew			Trough	A	C19	UN	Private	Closed	Limestone	UN	SP396290
WO182	Great Tew			Well	A	PM	UN	Private	Closed	Limestone	UN	SP397292
WO183	Great Tew			Tap	A	C20	UN	Private	Closed	Limestone	UN	SP396291
WO184	Combe			Pump	A	C19	2	Local Authority	Closed	Limestone	UN	SP412159
WO185	Charlbury	Nine Acres Lane	Charlbury Water Works	Waterworks	B	C19	5	Private	Open	Limestone	UN	SP358200
WO186	Stonesfield	The Riding		Tap	A	C19	3	Local Authority	Open	Limestone	UN	SP392174
WO187	Blenheim	Blenheim Park		Mineral Water Factory	G	C20	1	Private	Closed	Limestone	UN	SP450152
WO188	Chipping Norton	Glyme Farm		Waterworks	B	C19	5	Local Authority	Closed	Limestone	UN	SP326263

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Site Number	Parish	Place	Name	Type	Category	Date	Condition	Ownership	Parish Type	Geology	Designation	Grid ref
WO189	Chipping Norton	Old Chalford		Waterworks	B	C20	5	Local Authority	Closed	Limestone	UN	SP344257
WO190	Eynsham			Conduit	A	MED	5	Unknown	Closed	Clay	UN	SP431094
WO191	Eynsham	Eynsham Abbey		Pipe	A	MED	5	Private	Closed	Clay	UN	SP434092
WO192	Heythrop			Residential	G	C19	1	Private	Closed	Limestone	UN	SP351278
WO193	Heythrop	Broadstone Manor		Water Tower	C	C20	UN	Private	Closed	Limestone	UN	SP355262
WO194	Minster Lovell	Charterville		Well	A	C19	UN	Private	Intermediate	Limestone	UN	SP315098
WO195	Spelsbury	Ditchley Park		Residential	G	C18	UN	Private	Intermediate	Limestone	UN	SP390212
WO196	Witney			Swimming Pool	D	C19	3	Local Authority	Open	Limestone	UN	SP351107
WO197	Woodstock	Harrison's Lane		Tank	C	C19	5	Local Authority	Intermediate	Limestone	UN	SP443168
WO198	Woodstock	Oxford Street		Pump	A	C19	5	Local Authority	Intermediate	Limestone	UN	SP446168
WO199	Idbury	Foscot		Pump	A	C19	4	Local Authority	Closed	Limestone	UN	SP249219
WO200	Kiddington with Asterleigh	Over Kiddington	The Tap	TTap	A	C19	5	Local Authority	Closed	Limestone	UN	SP410222
WO201	Swerford	Swerford Park		Pump	A	PM	UN	Private	Closed	Limestone	UN	SP373313

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Catalogue of Sites Elsewhere in the United Kingdom

Site Number	County	District	Parish	Place	Feature Name	Feature Type	Date	Condition	Grid ref	Description
BD001	Bedfordshire	Bedford	Bolnhurst & Keysoe	Keysoe Row		Pump	PM	3	TL085613	Series of Glenfield & Kennedy lion head features along roads. Obviously part of village network.
BE001	Berkshire	Reading		Caversham	St Anne's Well	Well	MED	3	SU 7127750	Medieval holy well. Now in restored setting.
BE002	Berkshire	Reading		Caversham	Grove Hill Spa	Spring	PM	5	SU 716760	Spring which for a while supplied mineral water for sale.
BE003	Berkshire	Reading		Caversham	Water tower	Water Tower	MOD	1	SU 722775	Modern tower, part of TW system.
BE004	Berkshire	Reading		Emmer Green		Well	PM	5	SU 721765	Post-medieval well site.
BE005	Berkshire	West Berkshire	Theale	Bath Road		Pump	PM	4	SU 667719	Roadside pump for wetting road surface.
BE006	Berkshire	Reading		Caversham		Public Convenience	MOD	2	SU711746	Built for tramway passengers. Originally located on Reading side of Caversham Bridge. Now in Chiltern Open Air Museum. McFarlane 1906.
BE007	Berkshire	Reading				Pump	MOD	2	SU720722	Millenium feature
BE008	Berkshire	Wokingham	Remenham	Park Place		Waterworks	PM	5	SU784824	Waterworks for

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Site Number	County	District	Parish	Place	Feature Name	Feature Type	Date	Condition	Grid ref	Description
										Henley
BE009	Berkshire	Reading	Reading	Fobney		Waterworks	MOD	1	SU708711	Water treatment plant. Modern updates.
BE010	Berkshire	Reading	Reading	Manor Farm		Sewage works	MOD	5	SU707705	Sewage works, replacing BE011.
BE011	Berkshire	Reading	Reading			Sewage works	PM	5	SU711704	Site of sewage farms. New plant C21
BE012	Berkshire	West Berkshire	Shaw cum Donnington	Shaw House		Tap	PM	UN	SU475683	Water supply to upper floors
BE013	Berkshire	West Berkshire	Bradfield	Buckhold Hill Farm		Trough	MOD	UN	SU591750	Horse's feet design.
BR001	Bristol	Bristol	Avon	Montpelier		Swimming Pool	PM	5	ST595746	Early swimming pool.
BU001	Buckinghamshire	Aylesbury Vale	Dorton	Dorton Wood	Dorton Spa	Spa	PM	5	SP 668 136	Chalybeate well in wood, failed spa.
BU002	Buckinghamshire	Chiltern	Chesham Bois	burial ground		Drinking Fountain	MOD	UN	SP965001	War memorial.
BU003	Buckinghamshire	Aylesbury Vale	Hartwell		Egyptian House	Well Head	PM	2	SP793125	Road side spring in elaborate housing
BU004	Buckinghamshire	Aylesbury Vale		Dancers End		Waterworks	PM	3	SP904087	Former private waterworks, now Thames water.
BU005	Buckinghamshire	Wycombe	Fawley	Green		Well	PM	3	SU 756868	Wilders well.
BU006	Buckinghamshire	Aylesbury Vale	Bierton		St Rumbold's Well	Well	MED	2	SP836152	Restored Holy well by church
BU007	Buckinghamshire	Aylesbury Vale	Wing	Ascott House		Pump	PM	UN	SP891226	Steam engine
BU008	Buckinghamshire	Milton Keynes	Great Linford		Fulwell	Well	MED	5	SP851423	Spring, public supply blocked in 17th century. Now park feature.
BU009	Buckinghamshire	Milton Keynes	Great Linford		Hine Well	Well	MED	5	SP855418	Spring, public supply blocked in 17th century.
BU010	Buckinghamshire	Aylesbury Vale	Middle Claydon			Latrine	PM	UN	SP719257	Almshouses
BU011	Buckinghamshire	Aylesbury Vale	Middle Claydon	Claydon House		Spring	PM	UN	SP719253	Claydon House piped water

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Site Number	County	District	Parish	Place	Feature Name	Feature Type	Date	Condition	Grid ref	Description
BU012	Buckinghamshire	Aylesbury Vale	Botolph Claydon			Pond	UN	2	SP732243	Village pond. Close to sealed Botyl Well.
BU013	Buckinghamshire	Aylesbury Vale	Verney Claydon			Pump	PM	3	SP737273	Pump on green
CA001	Cambridgeshire	Cambridge	Cambridge	Emmanuel College		Swimming Pool	PM	UN	TL452583	1630, possibly earliest purpose built swimming pool.
CA002	Cambridgeshire	Cambridge	Cambridge			Well	PM	5	TL451583	Department store wells.
CE001	Cheshire	Cheshire West and Chester	Chester			Bath	C20	1	SJ411664	Baths
DE001	Derbyshire	Derbyshire Dales	Chatsworth	Chatsworth		Latrine	PM	UN	SK260701	WC in house
DE002	Derbyshire	High Peak	Hope Woodlands		Ladybower Reservoir	Reservoir	C20	1	SK184860	Supplied Manchester.
DE003	Derbyshire	High Peak	Derwent		Derwent Reservoir	Reservoir	C20	1	SK170911	Supplied Manchester.
DE004	Derbyshire	City of Derby	Derby			Waterworks	PM	UN	SK350360	Soccold engine in waterworks
DV001	Devon	Plymouth	Plymouth		Drake's Leat	Aqueduct	PM	4	SX546678	Drake's Leat system
ES001	Essex	Tendring	Ramsey			Trough	MO	UN	TM212304	Horse's feet design.
GG001	South Lanarkshire	Glasgow	Dalmarnock	Cunningar Loop	Glasgow Waterworks	Waterworks	PM	UN	NS621632	1806. Settling beds designed by Telford.
GL001	Gloucestershire	Cotswold	Eastleach	Eastleach Turville		Well Head	PM	3	SP201052	Well head near river.
GW001	Gwent	Monmouthshire	Skenfrith	B4521 Skenfrith		Drinking Fountain	PM	2	SO457202	War memorial erected by public subscription in 1920. Unusual in incorporating drinking Fountain.
GW002	Gwent	Monmouthshire	Skenfrith	B4521 Skenfrith		Trough	PM	2	SO457201	Drinking trough erected by Prosser family.
HE001	Hertforshire	St Albans	St Michael	Gorhambury		Conduit	PM	UN	TL113078	Water supply for

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Site Number	County	District	Parish	Place	Feature Name	Feature Type	Date	Condition	Grid ref	Description
						House				house.
IW001	Isle of Wight	Newport	Carrisbrooke	Carrisbrooke Castle		Well	PM	1	SZ486877	Donkey wheel on well
LI001	Lincolnshire	Lincoln	Lincoln		St Mary's Conduit	Conduit	C16	2	SK974709	Conduit supplying town. Extant.
LO001	London	Westminster		Broadwick Street, Soho		Pump	MO	1	TQ293810	Memorial plaque on site of otriginal pump.
LO002	London	Westminster		Broadwick Street, Soho		Pump	MO	2	TQ294810	Replica pump.
LO003	London	Westminster		Hyde Park		Drinking Fountain	MO	1	TQ270800	New fountain
LO004	London	Camden			Lamb's Conduit	Conduit	ME	5	TQ306819	Medieval and later feature
LO005	London	Hounslow		Brentford		Pumping Station	C19		TQ178774	
LO006	London	Newham			Abbey Mills	Pumping Station	PM	1	TQ387831	Bazalgette works
LO007	London	Bexley			Crossness	Pumping Station	PM	1	TQ485810	Bazalgette works
LO008	London	Westminster		Embankment		Monument	C20	1	TQ304803	Bazalgette monument. Erected 1901.
LO009	London	City of London		Snow Hill		Drinking Fountain	PM	2	TQ317814	First fountain from DFA
LO010	London	Tower Hamlets		Columbia Square		Residential	PM	5	TQ338828	Baroness Budrdett Coutts tenements
LO011	London	Westminster		Peabody Buildings		Residential	PM	2	TQ296790	CA - Pye, Horseferry, Abbey Orchard
LO012	London	Lambeth		Lambeth		Residential	PM	2	TQ313802	Peabody block CA
LO013	London	Westminster		Hyde Park	Serpentine	Swimming Pool		1	TQ273800	Artificial lake
LO014	London	Islington		Finsbury	Peerless Pool	Swimming Pool	PM	5	TQ314828	18th century Peerless Pool
LO015	London	Westminster		Marylebone		Bath	C19	5	TQ276819	Public baths
LO016	London	Southwark		Manor Place		Bath	C19	4	TQ320783	Bath
LO017	London	Westminster		Harrods		Well	PM	UN	TQ276796	Department store wells
LO018	London	Westminster		Regents Park		Drinking	PM	3	TQ275804	Drinking Fountain

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Site Number	County	District	Parish	Place	Feature Name	Feature Type	Date	Condition	Grid ref	Description
						Fountain				1869 Sir Cwasjee Jehangir
ME001	Merseyside	Liverpool	Liverpool	Liverpool Infirmary		Bath	PM	5	SJ357905	Hospital bath opened to public in C19
ME002	Merseyside	Wirral	Port Sunlight			Residential	PM	UN	SJ336896	Workers' village
ME003	Merseyside	Liverpool	Liverpool	St George's Dock		Bath	PM	5	SJ338902	Sea-water baths
ME004	Merseyside	Liverpool	Liverpool	Benison Street	Kitty Wilkinson's	Laundry	PM	5	SJ352901	Laundry
ME005	Merseyside	Liverpool	Liverpool	Frederick Street		Bath	PM	5	SJ348895	Baths and wash-house
ME006	Merseyside	Liverpool	Liverpool	Paul Street		Bath	PM	5	SJ345913	Baths and wash house
ME007	Merseyside	Liverpool		Bath Street		Bath	PM	5	SJ337908	1794, private
NN001	Northamptonshire	Northamptonshire	King's Sutton	Charlton Road	St Rumbold's Well	Well	C19	3	SP 5060 3624	Reproduction of well in walled enclosure
NN002	Northamptonshire	Northamptonshire	King's Sutton	Astrop Park	Astrop Spa	Spa	PM	5	SP 507365	Spring in wood
NO001	Norfolk	Norfolk	Holkham			Residential	PM	UN	TF891437	Earl of Leicester housing
PO001	Powys	Powys	Llanwddyn		Lake Vyrnwy	Reservoir	C19	1	SH999210	Supply for Liverpool.
PO002	Powys	Powys	Rhyader		Elan Valley	Reservoir	C19	1	SN919639	Supply for Birmingham.
PO003	Powys	Powys	LLandew			Well	MED	2	SO055307	Bishop's Palace has well set into wall to serve palace and village. Village side now has pump added.
SH001	Shropshire	Shrewsbury & Atcham	Shrewsbury	Salop Infirmary, St Mary's Street		Bath	PM	UN	SJ492125	Hospital bath opened to public in C19
SM001	Somerset	Bath & North East Somerset	Bath			Bath	RO	2	ST750647	Roman bath complex
SM002	Somerset	Bath & North East	Bath	Claverton		Bath	PM	5	ST751642	Cold bath

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Site Number	County	District	Parish	Place	Feature Name	Feature Type	Date	Condition	Grid ref	Description
		Somerset		Street						
SM003	Somerset	Bath & North East Somerset	Kelston			Latrine	PM	5	ST702661	Harington's original
SU001	Surrey	Sutton	Carshalton	Carshalton House		Bath	PM	UN	TQ277644	Bath was part of water tower.
SX001	West Sussex	Chichester	Petworth	Petworth House		Waterwheel	PM	UN	SU975219	Water supply for house.
SX002	West Sussex	Brighton & Hove		Woodingdean		Well	PM	UN	TQ361057	Deep well
WA001	Warwickshire	Warwick	Royal Leamington Spa	Outside former spa		Tap	C20	1	SP318655	Tap
WM001	West Midlands	Birmingham	Bourneville			Bath	C19	UN	SP318655	Bath in kitchen
WM002	West Midlands	Birmingham	Ladywell			Swimming Pool	C18	5	SP071863	Swimming pool
WM003	West Midlands	Birmingham	Birmingham			Fountain	PM	2	SP066868	Memorial to Joseph Chamberlain and serves market.
YO001	Yorkshire	North Yorkshire	York	Acomb Landing	York Waterworks company	Waterworks	PM	4	SE581526	Waterworks, Smeaton engine
YO002	Yorkshire	East Yorkshire	Hull	Stoneferry		Waterworks	PM	4	TA098306	Waterworks from 1846

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Catalogue of Sites in Europe

Site Number	Country	Town	Place	Feature Name	Feature Type	Date	Condition	Ownership	Description
801	Germany	Berlin	Klausenerplatz		Pump	c1900	1	Local Authority	Large local water pump with dolphin decoration. Typical of city. Still supplying water. Not seen used but no reason why not.
802	Germany	Bavaria?	Wolfsflucht		Water tower	C19	1	Water company?	Looks like water tower for area. Drinking taps and troughs flanking door. Location a little uncertain.
803	Germany		Mullenbach		Washing place	C19, probably traditional site	2	Local Authority	Former village washing place. Still plenty of water but now a shelter not used.
804	Germany	Nuremburg	Hauptmarkt	Schone Brunnen	Drinking Fountain	C19	2	City	Ornate Gothic fountain. Fenced off.
805	Germany	Berlin	Alexander Platz	Neptunbrunnen	Fountain	1891	1	City	Ornate ornamental fountain - Poseidon surrounded by 4 rivers (Elbe, Rhine, Oder, Vistula) shown as`women.
806	Germany	Nuremburg	Lorenzer Platz	Fountain of Virtues/ Mariage Carousel	Fountain	C19	1	City	Ornate allegorical fountain.

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Site Number	Country	Town	Place	Feature Name	Feature Type	Date	Condition	Ownership	Description
807	Germany	Aachen	near Kramerstrasse	Puppenbrunnen	Fountain	C20	1	City	Fountain with articulated puppets dangling.
808	Germany	Kleve		Lohengrin Fountain	Fountain	C20	1	Local authority	Story of Black Knight.
809	Italy	Ivrea	Via Riva?	Olivetti Fountain	Fountain	1957	1	City	Memorial to Olivetti - factory in Ivrea.
810	Hungary	Budapest	Kos Karoly Satany	Szechenyi Furdo	Baths	C18-19	1	Private	Public bath - spa type, one of many in town.
811	Switzerland	Augst			Drinking Fountain	C20	1	Public	Tap and trough - for young of town.
812	Sweden	Bobegd Udda	Private house		Pump	C19?	2	Private	Outside house. Now internal supply. Probably still used for garden. House in wild area - no fence between property and woods etc.
813	France	St Antheme			Tap	C20	1	Public	'Eau potable', back to back on structure with 814. Typical labelling in that part of France.
814	France	St Antheme			Basin	C20	1	Public	'Eau non potable' - back to back with 813. Typical labelling.
815	France	St Antheme			Fountain	C19	1	Public	Basin with column over, containing water spout, grids for resting containers.
816	France	St Antheme			Hydrant, by founrains	Med - C20	1	Public	Modern fire hydrant, standing next to two earlier types of fountain/trough. Reuse of supply point.
817	France	St Antheme			Hydrant	C19	2	Public	Near river - hydrant inscribed 'for fires and the carriageway'. Probably used river water. Probably not still operational.
818	Spain	Pamplona	Plaza de Consistorial		Fountain	Post-med	1	Public	Street water supply, several spouts with running water.
819	Spain	Pamplona	near Calle de Curia		Fountain	Post-med	1	Public	Street supply with several spouts and supports for vessels. Saw it used for rinsing bin.
820	Spain	Boixols			Tap, Trough	Post-med	2	Public	Tap with running water leading to series of troughs at different levels, some large. Probably

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Site Number	Country	Town	Place	Feature Name	Feature Type	Date	Condition	Ownership	Description
									washing place as well as water supply. Tractor driver stopped to get drink.
821	Spain	Noguers			Fountain	C20	1	Private	Pipe discharging water into tiled basin. Now garden feature, but probably site of earlier water point.
822	Spain	Roda			Tap	C20	1	Public	Modern tap in wall niche with basin. Probably restoration of earlier feature.
823	Spain	Benasques			Tap	C20	1	Public	Modern tap in brick and stone niche. Probably restoration of earlier feature.
824	Spain	Saragossa	Plaza de Jose Maria Forque		Drinking Fountain	C20	1	Public	Modern facility in park.
825	Spain	Saragossa	Avenio de Cesar Augusto		Fountain	C20	1	Public	Statue of Caesar Augustus in fountain, frog spurting.
826	Spain	Saragossa	Plaza`de Nuestra Senora del Pilar		Pool	C20	1	Public	Large rectangular pools with statues of Goyaesque figures around.
827	Spain	Saragossa	Plaza de Nuestra Senora del Pilar		Fountain	C20	1	Public	Far end of plaza. Circular basin with row of jets.
828	Spain	Saragossa	Plaza de Nuestra Senora del Pilar		Fountain	C20	1	Public	Irregular, angular pools at end of plaza, linked to geometric slope feature.
829	Spain	Monasterio de Leyre			Holy well	Med - modern	2	Possibly public, possibly monastery	Holy well. Water emerging in wall niche, series of connecting tanks leading downhill.
830	Spain	Monasterie del Leyre			Well	Med	2	Private	Former monastery well, stone surround, now gridded.
831	Spain	Garaioa			Tap	C19	1	Public	Typical British (Scots co design) lion head water Tap.
834	France	Paris		La Petillante	Drinking Fountain	C21	1	New -	New with choice of still or sParkling.

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Site Number	Country	Town	Place	Feature Name	Feature Type	Date	Condition	Ownership	Description
832	Switzerland	Mariastein	Rotberg Castle		Tap	Med	2	Private	Tap feeding into trough in castle courtyard. Now flower bed.
833	France	Lucelle			Tap	Post-med	1	Public	Tap feeding Trough in Park. Good working order.
835	Italy	Acceglio			Tap	Post-med	1	Public	Roadside tap. Working.
836	Italy	Acceglio			Spring	Post-med	1	Public	Spring running from spigot into trough in Park. Memorial plaque with poem.
837	Italy	Acceglio			Tap	Post-med	1	Public	Roadside tap and large trough.
838	Italy	Acceglio			Tap	Post-med	1	Public	Roadside tap. The mineral content is displays on a board above it.
839	France		Col de Festre		Tap	Post-med	1	Public	Drinking water, labelled, available at top of col.
840	France		Col de Fa		Spring	Post-med	1	Public	Water tanks with constant flow in isolated location, behind hut.
841	France		Col de Brouis		Tap	Post-med	1	Public	Roadside tap and trough by roadside at top of col.
842	France	Ailefroide			Trough	Post-med	2	Private	Large tank, typical of area. Probably doubled as washing place as well as water source.
843	France	St Martin Vesubie			Fountain	Post-med	1	Public	Ornamental Fountain with troughs in market square.
844	France	St Martin Vesubie			Kennel	Med - Post-med	2	Public	Open stream running down street.
845	France	St Marin Vesubie			Tap	Post-med	1	Public	Tap and trough on side street.
846	Switzerland	Basel			Fountain	Post-med	1	Public	Ornamental Fountain and trough, with grids for buckets.
847	Switzerland	Basel			Drinking Fountain	Post-med	1	Public	Ornamental drinking fountain with Basle logo.
848	Switzerland	Basel			Fountain	Post-med	1	Public	Ornamental fountain
849	Switzerland	Basel			Tap	Post-med	1	Public	Trough and tap near river.

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