

Large-scale excavations in Europe: Fieldwork strategies and scientific outcome



Edited by Jörg Bofinger and Dirk Krausse

EAC Occasional Paper No. 6

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Proceedings of the International Conference
Esslingen am Neckar, Germany, 7th – 8th October 2008

Edited by Jörg Bofinger and Dirk Krausse



Baden-Württemberg
MINISTERIUM FÜR FINANZEN UND WIRTSCHAFT



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Published by:

Europae Archaeologia Consilium (EAC), Association Internationale sans But Lucratif (AISBL), Siège social

Koning Albert II-laan 19

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www.e-a-c.org

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In association with:

Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart

Verband der Landesarchäologen in der Bundesrepublik Deutschland

With financial support of the Ministerium für Finanzen und Wirtschaft Baden-Württemberg

The opinions expressed in this volume are those of the individual authors, and do not necessarily represent official policy.

ISBN 978-963-9911-29-1

Brought to publication by Archaeolingua, Hungary

Managing editor: Elizabeth Jerem

Copy-editing by Karen Schmitt, Lexis, Stuttgart, Germany

Layout and typesetting by Lukas Kretzschmar, Tebitron, Gerlingen, Germany

Cover design by Gergely Hős

Printed by Aduprint Printing and Publishing Ltd, Hungary

Cover:

Excavations on the route of the EPS-pipeline in east Württemberg.

Photo © Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart.

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Foreword

Large-scale infrastructure construction has been going on in Europe for decades. Every generation believes that it is going to fulfil the needs of development for the far future, but after 25 years the solutions are completely out of age. The politicians look from the perspective of economic growth of regions, employment and benefit of the people and they raise funds for development projects of different kinds believing in a better future for everyone. The goals seem, however, never to be achieved, accordingly development is perpetually ongoing. The first European convention on the protection of the archaeological heritage was the outcome of the intensified post war development. The convention had however to be renewed, as Europe's archaeological heritage remained threatened by the escalating development.

Due to the Valetta convention we archaeologists are following the progress by carrying out excavations, which in some cases tend to be really large-scale ones. Considerable infrastructure developments lay special claims on the archaeologists. Even if the excavations carried out are funded more or less properly and adequate methods can be used, there still linger many questions concerning the ethics of excavating and the responsibilities of the archaeologists. The results of the excavations vary and are processed in different ways. The amount of data is overwhelming, not to speak of the number of artefacts collected. We are not always capable of managing the outcome in the proper way. Some of the results will be stored and forgotten in the archives. Coming generations of archaeologists will find some of it useless as archaeology as a science will be developing in a direction we cannot even imagine today. We can, on the other hand, in many ways benefit from the information retrieved from large-scale excavation projects. Excavating vast areas gives us new opportunities to interpret the archaeological landscape as a whole with traces of human activities far away from the settlement sites.

Infrastructure and other large-scale development plans threatening the archaeological heritage cannot always be stopped. Excavating is the second best solution if the archaeological heritage will otherwise be destroyed. The ideal is to carry out proper excavations and publish the results scientifically, as well as for an interested public. When it comes to large-scale investigations, they have to be initiated with the right research focus in order to achieve the view of "the bigger picture", which is a chronological as well as a spatial one. To manage this difficult time and resource consuming task very special efforts are needed.

One of the goals of *Europae Archaeologiae Consilium*, the network of heritage managers in Europe, is to disseminate experiences and best practices in the field of the management of Europe's archaeological heritage. By publishing experiences from various countries much valuable knowledge can spread for the benefit of the archaeologists as well as for the contractors. This volume of EAC Occasional Papers presents the papers of the symposium "Large-scale excavations in Europe. Field work strategies and scientific outcome" in Esslingen am Neckar, Baden-Württemberg, 7th to 8th October 2008. The symposium was arranged by *Landesamt für Denkmalpflege Baden-Württemberg* in collaboration with *Verband der Landesarchäologen in der Bundesrepublik Deutschland* and *Europae Archaeologiae Consilium*. The volume is completed by some papers given on earlier occasions.

The papers present very different approaches to the theme of large-scale excavations. Infrastructure projects, airports and motorways have revealed different aspects of the challenge. The topic has also been the viewpoint for questions concerning the academic value of the excavation results and popularization of archaeology. The scope is broad but lacks geographical covering. All the papers are from central and Western Europe, which is an imperfection. Large-scale excavations have been carried out in the Scandinavian countries as well as in Southern Europe. We also miss a presentation that reveals the complexity of the concept of large-scale excavation. The recent underwater archaeology investigations for the gas pipeline to be built in the Baltic Sea from Russia to Germany, which is one of the largest underwater contract archaeology projects ever carried out, will hopefully be presented on another occasion.

This volume is the result of the unselfish editorial work of Dr. Jörg Bofinger, *Landesamt für Denkmalpflege Baden-Württemberg*. On behalf of EAC I wish to express our gratitude for his efforts. EAC is also greatly indebted to its treasurer Dr. Dirk Krausse, *Landesamt für Denkmalpflege Baden-Württemberg*, and Professor Dr. Jürgen Kunow, president of *Verband der Landesarchäologen*, who have supported the publishing of the volume. There will however be no book without writers. My special thanks go to all the contributors, both the ones who attended the symposium in Esslingen and those who kindly delivered papers to the volume.

Helsinki, 24th February 2010

Marianne Schauman-Lönnqvist
President of EAC

“Large-scale excavations in Europe: Fieldwork strategies and scientific outcome”

Esslingen, October 7th 2008
Welcome – Introduction

Dear ladies and gentlemen,
dear colleagues and friends!

It is a great pleasure for me to welcome you here in Germany, in Esslingen. Of course, this warm-hearted welcome is not only from myself, but also on behalf of the *Verband der Landesarchäologen in der Bundesrepublik Deutschland*, this means the *Association of State Archaeologists of Germany*. For those who don't already know me, my name is Jürgen Kunow and I am the chairman of our *Association*. You know we have a federal structure in Germany and since our reunion – we celebrated this event a few days ago for the 18th time – we have now 16 federal states, which are responsible for all cultural affairs. This naturally includes all things concerning the archaeological heritage management, rescue excavations or legal protection. Therefore we need our *Association* as the platform to exchange information or to give best practise examples beyond state borders, and especially to help and support each other from federal state to federal state. Without any problem you can compare duties and tasks of the *Verband der Landesarchäologen* with our european network, the *EAC – Europae Archaeologiae Consilium* on a European level. Our state archaeologists are – as you know – all members of the *EAC*.

So, why we are here in Esslingen? I think, we are here because we need an update on a higher level than a national one about how we deal with our topic “*Large-scale excavations in Europe: Fieldwork strategies and scientific outcome*”. If I am right, five or six years ago – 2002 or 2003 in Strasbourg or Berlin – we already held an *EAC*-conference in a similar context but – no matter why – unfortunately the written documentation of this meeting failed, we still miss the publication. I am convinced that we won't live to see that here in Esslingen 2008.

I think in the next two days we will have very interesting papers and fruitful discussions. Not only the subtitle of our conference “*Fieldwork strategies and scientific outcome*” promises a lot. We have speakers from more than a dozen European states and we will hear about very different situations of large-scale excavations activated by huge traffic projects, planning of new pipeline-routes, brown coal (lignite) mining or great commercial projects within our cities, and so on.

But now let me come to an end, because you are not only here to listen to welcome speeches or introductions. You know this a common conference from the *EAC* and the *Landesamt für Denkmalpflege Baden-Württemberg*. We are invited by both institutions, but of course we owe special thanks to the local organizer, the *Landesamt für Denkmalpflege Baden-Württemberg*, and namely to our colleagues and friends, Jörg Bofinger and Dirk Krausse, and of course to their chief, the president of the *Landesamt für Denkmalpflege Baden-Württemberg*, Dieter Planck. Worldwide, the Germans are sometimes praised, sometimes smiled at for their tendency to perfect organisation, but the best of us are found here in Baden-Württemberg. So I am convinced that we will have a very well organized meeting in a harmonious and friendly atmosphere.

Thank you for coming!

Prof. Dr. Jürgen Kunow
Chairman, Verband der Landesarchäologen
in der Bundesrepublik Deutschland

Vor- und Grußwort des Gastgebers

Das Landesamt für Denkmalpflege Baden-Württemberg dankt allen, die unserer Einladung nach Esslingen zur Teilnahme an der Tagung „Large-scale excavations in Europe“ im Jahre 2008 gefolgt sind. Unser besonderer Dank gilt jenen, die die Tagung durch Vorträge und den vorliegenden Band durch Beiträge bereichert haben. Tagung und Tagungsband sind in einer Kooperation zwischen dem European Archaeological Council, dem Verband der Landesarchäologen in der Bundesrepublik Deutschland und dem Landesamt für Denkmalpflege Baden-Württemberg entstanden. Die Kooperation dieser drei Veranstalter spiegelt die drei Ebenen wider, die während der Tagung gleichwertig behandelt wurden: europäische Metaebene, nationale Ebenen in Deutschland und anderen europäischen Staaten sowie die jeweiligen regionalen Perspektiven innerhalb Deutschlands.

Die Initiative, eine internationale Tagung zu linearen Projekten und anderen Großgrabungen in Esslingen zu veranstalten, ist vor dem Hintergrund der Tatsache zu sehen, dass die Archäologische Denkmalpflege in Baden-Württemberg ab etwa 2006 mit einer Reihe von Planungen und Ausführungen zu entsprechenden Infrastrukturmaßnahmen konfrontiert worden ist. Neben den großen Pipelineprojekten EPS (Ethylen-Pipeline-Süd) und SEL (Süddeutsche Erdgasleitung) sind hier insbesondere die Planfeststellungsverfahren zu gigantischen Erdeingriffen im Zusammenhang mit dem Bau wichtiger Bahnstrecken, nämlich der ICE-Trassen Stuttgart–Ulm und Basel–Karlsruhe, zu nennen.

Anders als in vielen europäischen Nachbarstaaten oder anderen Ländern der Bundesrepublik Deutschland konnten wir in Baden-Württemberg in den 1990er Jahren kaum Erfahrungen mit entsprechenden Großprojekten sammeln. Dies liegt einerseits daran, dass der Bau großer Versorgungsleitungen, von Bahn- und Straßenbau in Südwest- und Westdeutschland zeitlich versetzt erst in den letzten Jahren in Angriff genommen wurde. Andererseits hinken viele „Altbundesländer“ auch denkmalschutzrechtlich und organisatorisch der Entwicklung in den „neuen“ Bundesländern und anderen europäischen Staaten seit einigen Jahren hinterher – Baden-Württemberg macht hier keine Ausnahme: Das Veranlasserprinzip ist im Denkmalschutzgesetz Baden-Württembergs nicht festgeschrieben, so dass die in Artikel 8 der Konvention von Malta festgeschriebene Kostentragungspflicht für die Finanzierung von Rettungsgrabungen auf anderem Wege sichergestellt werden musste. Zudem war die Archäologische Denkmalpflege in Baden-Württemberg personell und infrastrukturell auf die logistischen Herausforderungen linearer Großgrabungen nur unzureichend vorbereitet. Schließlich stellten sich aus Anlass der konkreten Bauvorhaben auch die Fragen nach den tatsächlichen Kosten für die archäologische Betreuung von linearen Großprojekten und nach dem zu erwartenden historischen und wissenschaftlichen Erkenntnisgewinn bei entsprechenden Rettungsgrabungen.

Vor diesem Hintergrund lag es nahe, Vertreter aus dem In- und Ausland zu einem Austausch nach Esslingen einzuladen, in der Hoffnung, von den anderenorts gemachten Erfahrungen für die anstehenden Projekte in Baden-Württemberg zu profitieren. Der vorliegende Band legt eindrucksvoll Zeugnis darüber ab, dass diese Erwartungen mehr als erfüllt worden sind. Für unsere eigene Arbeit in Baden-Württemberg haben wir durch die Vorträge und Beiträge viel gewinnen können. Dafür sind wir den Teilnehmern und Autoren zu Dank verpflichtet. Ich bin jedoch davon überzeugt, dass der Band auch für viele andere eine wertvolle Hilfe bei der Bewertung, Konzeption und Realisierung großflächiger Prospektions- und Grabungsprojekte sein wird.

Kultur, und damit auch die Archäologische Denkmalpflege, ist in Deutschland Sache der Bundesländer. Tagung und Tagungsband führen aber nachdrücklich vor Augen, wie wichtig der juristische, organisatorische und wissenschaftliche Erfahrungsaustausch auf europäischer und nationaler Ebene ist. Archäologische Denkmalpflege braucht – heute stärker denn je – die grenzüberschreitende Perspektive, um zu angemessenen Lösungen und Ergebnissen gelangen zu können. In diesem Sinne können wir „archäologischen Denkmalschützer“ uns glücklich schätzen, mit EAC und VLA über schlagkräftige Organisationen zu verfügen, die den internationalen und nationalen Erfahrungsaustausch fördern und über ein gut funktionierendes Netzwerk in Europa und Deutschland verfügen.

Von diesem Netzwerk hat auch die Esslinger Tagung profitiert. Mein Dank gilt dabei stellvertretend der damaligen Präsidentin des EAC, Marianne Schauman-Lönnqvist, und dem Vorsitzenden des VLA, Jürgen Kunow, für die Unterstützung der Tagung und der Publikation.

An der Vorbereitung der Tagung und an der Realisierung des Tagungsbandes haben zahlreiche Mitarbeiter des Landesamts für Denkmalpflege Baden-Württemberg mitgewirkt. Mein ganz besonderer Dank gilt dabei Jörg Boffinger, der die wissenschaftliche Betreuung des Bandes geleistet hat und den Kontakt zu den Autoren gehalten hat. Dank gebührt auch David Bibby für die Hilfe bei der Überarbeitung englischsprachiger Beiträge und Zusammenfassungen. Die redaktionelle Betreuung des Buches lag bei Karen Schmitt, Lexis Lektorat, Stuttgart. Die Redaktions- und Layoutarbeiten wurden aus Mitteln des Ministeriums für Finanzen und Wirtschaft des Landes Baden-Württemberg finanziert. Die Druckkosten wurden vom EAC getragen.

Esslingen, im Dezember 2011

Prof. Dr. Dirk Krausse
Landesarchäologe von Baden-Württemberg
Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart

Participants of the Esslingen conference.



1 | Die Bedeutung denkmalpflegerisch bedingter Großprojekte für die archäologische Forschung

Harald Stäuble

Zusammenfassung: Das wissenschaftliche Potenzial jener großflächigen archäologischen Projekte, die auf die denkmalpflegerische Betreuung großer Bau- oder Abbauvorhaben zurückgehen, ist noch zu wenig erkannt worden. Die aus wirtschaftlichen Gründen unumgänglichen Großprojekte können zu wissenschaftlichen Erkenntnissen führen, die auf keine andere Weise gewonnen werden können, weder was den großräumigen wissenschaftlichen Ansatz betrifft, noch was das finanzielle Volumen angeht. Sie sind demnach im wahren Sinne des Wortes ein ideales Werkzeug für eine Archäologie der Landschaft, d.h. nicht nur für das Erkennen von vor- und frühgeschichtlichen Siedlungen selbst, sondern auch der unbewohnten Regionen. Zudem bergen gerade die aus archäologischer Sicht zufälligen Eingriffe die große Chance, unsere bisherigen Hypothesen und Modelle stets neu zu prüfen und zu korrigieren.

Abstract: The importance of large-scale rescue excavations for 'academic' studies. Generally, we need to differentiate but not part these two aspects: the heritage care aspect of the sheer management of the confronted task and the aspect of scientific questions as well as the scientific output. It is true, that one can have but little influence on the realization, the course or the size of a planned railroad, pipeline or any other large-scale building or extracting project. In this sense, the archaeological heritage care can only react to these kinds of projects. But it is also true, that there is often no other realistic possibility to gain more knowledge from, than by defining and excavating sites known from this sort of random sampling technique. As there is no predictive model, which suits the geographical, chronological and cultural diversity of archaeological situations, it is a unique chance for landscape archaeology as well as the basics for any theoretical predictive methods.

Es gibt Bilder von archäologischen Großprojekten, die zwar positiv gemeint sind, die aber nicht die Regel darstellen sollten (Abb. 1.1), denn wenn sich die archäologische Denkmalpflege beispielsweise bei Leitungsverlegungen erst nach dem Aushub des Leitungsgrabens daran beteiligt und nur noch die Profile eines schmalen Eingriffs betreuen und dokumentieren kann, dann ist der Auftrag der archäologischen Denkmalpflege, die Sache, für die wir uns täglich einsetzen, schon verloren, dann ist man bei der Aufgabe einer umfassenden Landschaftsarchäologie gescheitert. Aber es wäre falsch zu denken, die problematische Situation, die hier an einigen willkürlich ausgewählten Bildern beispielhaft gezeigt werden soll, betreffe lediglich die archäologische Denkmalpflege, denn im Grunde genommen geht es um allgemeine Erkenntnisse, die die gesamte archäologische Forschung betreffen. Den vor allem organisatorisch stark ausgeprägten Dualismus zwischen denkmalpflegerischen und universitären „Belangen“ aufzuheben, mit allen potenziellen, für beide Seiten positiven Auswirkungen, wäre eines der Plädoyers dieses Beitrags. Neben der Tatsache, dass ein solches Bild den sehr löblichen, fast selbstlosen und überdurchschnittlich hohen Einsatz einer Grabungsmannschaft oder einzelner Personen in allen Extremlagen zeigt, sollte man eher bedenken, was bei einer solchen Vorgehens-

weise unnötig verloren geht bzw. wie unvollständig oder gar falsch das Ergebnis sein kann, auf das man daraus schließen will. Denn selbstverständlich sinkt die Chance, Fundstellen zu erkennen und zu erfassen, je kleiner oder schmaler der tatsächliche Bodeneingriff ist oder je später er beobachtet werden kann. Das bedeutet umgekehrt auch, dass die Wahrscheinlichkeit tatsächlich höher wird, eine erheblich größere Vielfalt unterschiedlicher archäologisch verwertbarer Informationen – und seien es nur negative, aber auch solche bisher unbekannter Fundstellen – zu erhalten, je häufiger und großflächiger der Einblick in den Boden ist, d.h. je dichter das Untersuchungsrastraster gelegt wird. Es geht in diesem Beitrag demnach nicht um konkrete Funde oder um die vielen schönen vor- und frühgeschichtlichen Fundstellen, die bei den archäologischen Großprojekten natürlich fast schon per Definition in überdurchschnittlicher Zahl zutage treten, sondern um das Ziel und den Sinn der denkmalpflegerischen Großprojekte als „a way to produce knowledge“ (Glørstad & Kallhovd 2011). Insoweit ist das erste auch das einzige Bild von einer konkreten Ausgrabungssituation, das hier gezeigt werden soll: Die folgenden Beiträge werden mit Sicherheit viele schöne Bilder bringen, man wird von zahlreichen Ausgrabungen erfahren, von wichtigen vorgeschichtlichen Siedlungen und vielen



Abb. 1.1: Eine Betreuung der tief greifenden Baumaßnahmen ist aus geoarchäologischer Sicht unerlässlich, doch muss das so weit im Voraus stattfinden, dass genügend Zeit bleibt, die sich daraus ergebenden archäologischen Ausgrabungen zu planen und durchzuführen, und das nicht nur im Leitungsgraben, sondern möglichst flächig im gesamten Baustreifen. Insoweit darf dies wegen des potenziellen Zeitverzugs nicht erst den Bau begleitend geschehen.

wunderbaren Funden – aber es werden hoffentlich auch die Probleme und Lösungen benannt, die man auf dem langwierigen Weg hatte, um dorthin zu kommen. Insoweit wird der vorliegende Beitrag nicht fallbezogen sein, nicht das eine oder andere Großprojekt vorstellen, sondern versuchen, einen Überblick über die potenziellen Vorteile einer Arbeitsweise zu geben, die zugegebenermaßen nicht immer die einfachste ist, sondern eher eine recht aufwendige, sowohl was die Zeit als auch, was die Kosten betrifft. Insoweit handelt es sich weniger um einen theoretischen Beitrag, sondern um einen aus sächsischer Sicht auf Erfahrung basierenden.

I. Die denkmalpflegerisch bedingten Großprojekte

Zunächst einmal sei festgestellt, was man unter denkmalpflegerisch bedingten Großprojekten zusammenfassen kann, denn meist ist nicht nur die reine Größe eines Eingriffs maßgeblich. Die Größenangabe muss gepaart sein mit der Angabe der Dauer, die für den Bau oder Abbau geplant ist, bzw. mit der Zeit, die im Vorhinein für die Archäologie eingeplant werden kann (Abb. 1.2a).

Zu den klassischen Großprojekten gehören vor allem die Braunkohlentagebaue wie auch die sonstigen Abbauflächen für Steine und Erden; wobei Letztere in der Größe und Abbauzeit im Vergleich zur ungleich größeren „Flächen-Vernichtungs-“ bzw. „Versiegelungs-Maschinerie“ der Bebauungspläne unserer Städte und vor allem Stadtränder manchmal fast schon klein anmu-

ten. Hinzu kommt allerdings auch, dass dieser immer noch explodierende Siedlungsausbau aus technischen Gründen schwer in den Griff zu bekommen ist, wenn er auf die einzelnen Hausbesitzer bzw. Bauherren reduziert wird. Kies- und andere offene Tagebaue haben dagegen den Vorteil, dass der Abbau meist über mehrere Jahre planbar erfolgt und zumeist mit demselben Ansprechpartner zu verhandeln ist.

Schwieriger ist der Umgang mit den um ein Vielfaches größeren Eingriffen, die durch Gewerbe- und Industriegebiete bedingt sind (Abb. 1.2b). Diese vereinen nämlich sowohl die Größe von Braunkohlentagebauen als auch die Vielzahl von unterschiedlichen Bauträgern und somit auch die damit verbundenen Probleme. Sie haben vor allem den grundlegenden Nachteil, dass ihre Bekanntgabe relativ kurzfristig erfolgt, d.h. es besteht oftmals eine extrem kurze Zeit zwischen der Genehmigung der Baubehörde und der Bekanntmachung an die Archäologischen Ämter. Zudem ist das mit dem Wunsch der Investoren gepaart, ihr Projekt schnellstmöglich in Betrieb zu sehen. Dieses Dilemma wird gerade bei Großprojekten verstärkt, wo sich neben den eigentlichen Großinvestitionen selbst auch noch weitere Eingriffe ergeben, seien es vorbereitende Baumaßnahmen (wie Leitungsumverlegungen) oder auch Folgebauten. Zusätzlich besteht dabei noch ein besonders hoher wirtschaftlich-politischer Druck, dem schwer gegenzuhalten ist. Als Beispiele seien hier nur der zwischen mehreren europäischen Städten ausgetragene Wettbewerb um einen Großinvestor für den Bau eines Autowerks genannt oder der Kampf um die Vorherrschaft der Luftfahrtkreuze. Verglichen mit

a) Braunkohlentagebau Zwenkau
 Abbaufäche ca. 250 ha
 gegrabene Siedl.fläche ca. 82,6 ha
 Dauer ca. 8 Jahre

b) Industriegebiet Plaußig - BMW-Gelände
 Abbaufäche ca. 244 ha
 gegrabene Siedl.fläche ca. 11,4 ha
 Dauer ca. 1 Jahr

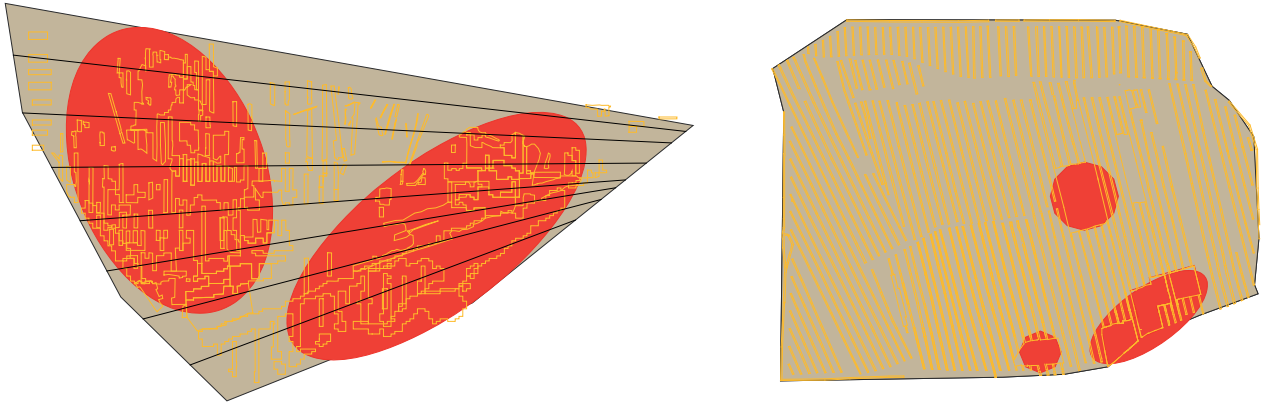


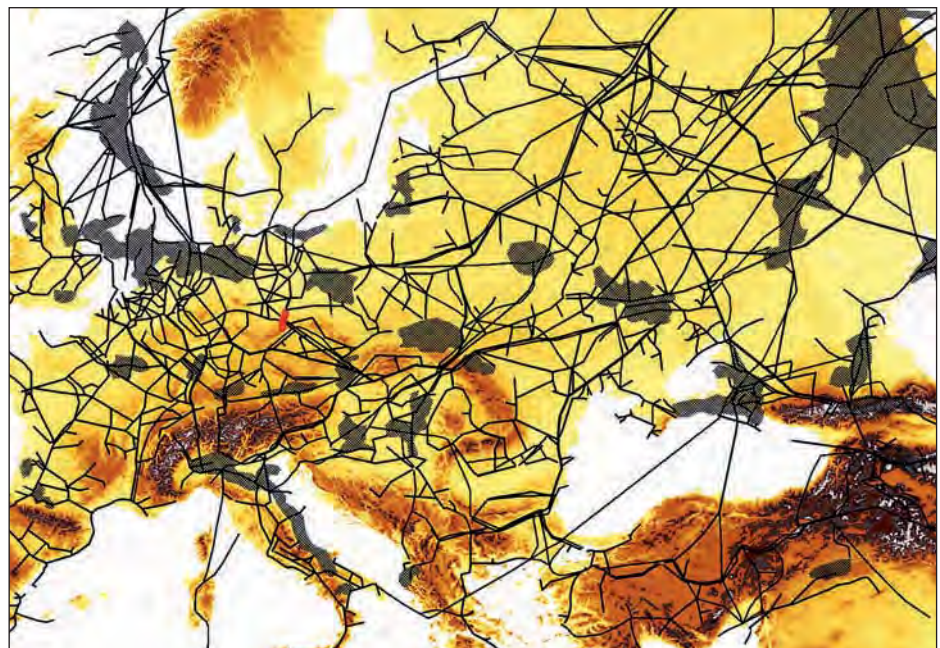
Abb. 1.2a, b: a Konturen des Braunkohlentagebaus Zwenkau, Lkr. Leipzig mit der rund 250 ha großen Fläche, die zwischen 1993 und 2000 abgebaut wurde. – b Die etwa gleich große Fläche, die für das BMW-Werk in Plaußig bei Leipzig innerhalb eines Jahres beansprucht wurde.

solchen Projekten können sogar die archäologischen Arbeiten in einem Braunkohlentagebau als entspannt gelten. Allerdings muss man noch hinzufügen, dass die Herangehensweise nicht zuletzt auch von der archäologischen Landschaft bzw. der Dichte des archäologisch fassbaren Materials abhängt, denn es macht einen nicht unwesentlichen Unterschied aus, ob man z. B. von einer insgesamt 250 ha großen Fläche 15 ha oder 80 ha archäologische „Fundstelle“ mit Siedlungsspuren antrifft (Abb. 1.2).

Für den Umgang mit Großprojekten und dabei vor allem mit den linearen Baumaßnahmen, die hier als Schwerpunkt behandelt werden sollen, ist auch wichtig, ob es sich um Maßnahmen handelt, die über einzelne organisatorische Einheiten hinweg reichen, seien

es Gebietsreferate innerhalb eines Bundeslandes, über die Bundesländer hinaus oder sogar über die nationalen Grenzen hinweg. Das Problem hierbei liegt vor allem in der gewünschten, aber eher selten gegebenen einheitlichen Herangehensweise nicht nur aus archäologischer, sondern auch aus verhandlungstechnischer Sicht, da es sich häufig um denselben Bauträger handelt, der die archäologischen Erfordernisse und Arbeiten nachvollziehen soll und letztendlich mitfinanzieren muss. Das ist vielleicht etwas weniger problematisch bei überregionalen Straßen – denn diese werden meist auch durch lokale Straßenbauämter organisiert und betreut –, sondern das Problem stellt sich hauptsächlich beim Paradebeispiel für Großprojekte, bei den Trassen für die unterschiedlichsten Pipelines (Abb. 1.3).

Abb. 1.3: Das „nur“ etwa 100 km „kurze“ Teilstück der OPAL durch Sachsen (rot), das in den Jahren 2008/09 archäologisch betreut wurde, innerhalb der „Welt der Pipelines“ (auf Grundlage einer Abbildung in „Die Zeit“ vom 3. 1. 2008).



II. Ziel der archäologischen Denkmalpflege

Das primäre Ziel der archäologischen Denkmalpflege liegt zwar in der Tat im Schutz der Denkmale, doch kann diese Aufgabe nicht so absolut erfüllt werden; schon gar nicht im Bereich der Referate für bauliche Großprojekte. Denn es ist unbestritten, dass man Pipelines, Straßen, Siedlungen, Kiesgruben oder gar Braunkohlentagebaue braucht, diese also nicht vollständig zu verhindern und auch nicht wesentlich zu verschieben sind. Unbestritten ist allerdings auch, dass sie durchaus nicht alle nötig sind und dass es sich lohnen würde, für eine deutliche Reduzierung zu kämpfen; aber darum kann und soll es an dieser Stelle nicht gehen.

Es wird insoweit mit Sicherheit Konsens darüber bestehen, dass es sogar aus denkmalpflegerischer Sicht wenig sinnvoll wäre, gegen den Ausbau schon bestehender Bereiche zu kämpfen (z.B. die Erweiterungen von bestehenden Flächen eines Flughafens oder von schon bestehenden Autobahnen, Kiesgruben usw.), um z.B. archäologisch weniger brisante Ersatzflächen für völlige Neubauten anzubieten, zumal sich die Flächenzerstörung dadurch sogar noch vergrößern würde! Auch der aus der archäologischen Perspektive zwar verständliche, aber aus allgemein menschlicher Sicht und aus Aspekten der Umwelt sicher schädlichere Versuch, die großflächigen Maßnahmen auf vor- und frühgeschichtlich eher dünn besiedelte Regionen umzuleiten, wird keine ernstzunehmende Chance haben oder überhaupt eine zu wünschende Alternative sein! Abgesehen davon sollte mittlerweile Konsens darüber bestehen, dass Umtrassierungen aufgrund von allgemein bekannten, aber gängigen Flächendenkmälern bzw. die Unterschutzstellung von bekannten Denkmälern, vielleicht auch nur durchschnittlicher Qualität, weder dem Denkmalschutz noch der Wissenschaft und schon gar nicht den Investoren oder somit dem Geldgeber dienen: Schließlich kann niemand gewährleisten, dass mit einer Verlegung nicht eventuell noch mehr an archäologischer Substanz zerstört wird, die vielleicht sogar – weil unbekannt oder nicht sichtbar und erfassbar – von besserer Qualität wäre. Selbstverständlich beziehe ich mich hier nicht auf oberirdisch bekannte und sichtbare Denkmale, die ohne Zweifel von dieser Diskussion ausgenommen werden sollen. Katastrophal wäre es, wenn man die Auflage der Umtrassierung mit einer vollständigen Freigabe verbinden und dadurch zwar die bekannten Denkmale retten würde, aber niemals erfahren könnte, was sonst an Neuem, bislang Unbekanntem verloren gegangen ist!

Insoweit soll es hier weder um die politisch-wirtschaftlich-sozialen Fragen gehen, warum, wie viele und welche Flächen zerstörenden Bau- und Abbauprojekte durchgeführt werden, noch darum, ob man den Status der darin liegenden archäologischen Denkmale in den Status einer dokumentierten Fundstelle transformieren darf oder soll, sondern es geht vor allem um die Durchführbarkeit, es geht darum, den nicht immer günstigen Herausforderungen gewachsen zu sein und den größtmöglichen Ertrag zu gewinnen und somit den bestmöglichen Weg zu gehen. Es soll also eher um das „Wie“ gehen: wie man auf große Bau- und Abbauvorhaben angemessen reagiert, wenn die Entscheidung gefallen ist, dass definitiv gebaut oder abgebaut werden soll; und natürlich auch um die Frage, was eine angemessene Reaktion ist bzw. wie man die in manchen Denkmalschutzgesetzen erwähnte Zumutbarkeitsgrenze bestimmt?

Wenn also das erste Ziel, die archäologischen Denkmale in ihrem natürlichen Ambiente zu bewahren und zu schützen, aus den oben genannten Gründen nicht erreichbar ist, so kann das zweite große Ziel nur sein, die notwendigen Rettungsmaßnahmen einzuleiten, und zwar die situationsbedingt stets besten: Wenn die Baumaßnahmen schon nicht zu vermeiden sind, dann sollte man die Gelegenheit zu deren Erforschung wahrnehmen! Diese Rettungsmaßnahmen könnte man banal „eine Ausgrabung durchführen“ nennen, aber auch mit einer negativen Konnotation „ein Denkmal zerstören“. Oder man erkennt die Chancen, die darin liegen, und sieht, dass sie selten günstige Mittel auf dem Weg dahin darstellen, Wissen zu gewinnen. Wer welche Bezeichnung dafür wählt, kann entweder fachpolitisch motiviert sein, oder es ist oftmals eine Rechtfertigung der eigenen Meinung und Arbeitsweise. Man könnte aber auch sagen, es sind die kleinen, aber notwendigen Schritte – wenngleich sie im Unterschied zu anderen, kleinen Maßnahmen oder eingeschränkten Quellen wesentlich größer sind –, um das große Ganze zu sehen. „Seeing the bigger picture“, so der Titel des Vortrags von Roger Thomas, darf aber nicht heißen, dass man im Namen eines größeren Gesamtbildes auf die Einzelkomponenten, z.B. auf die konkreten feldarchäologischen Arbeiten verzichten könnte; vielmehr sollte es bedeuten, dass gerade die aus den Großprojekten entstandenen Ausgrabungen stärker beachtet, unterstützt und dann auch für das zu erstellende Gesamtbild genutzt werden müssen. Sogar wenn die archäologische Betreuung der Baumaßnahmen nur zu sogenannten Rettungsgrabungen führen sollte, bieten die daraus gewonnenen Ergebnisse, und zwar sowohl die archäologisch positiven wie auch gerade die negativen (im Sinne von Fehlstellen, die ansonsten kaum jemals geprüft werden könnten) eine einmalige Gelegenheit, den Bestand und die Qualität der noch erhaltenen archäologischen Spuren zu erfassen.

III. Gesetzliche Grundlagen

Das Beste daraus zu machen ist denn auch ein allgemeingültiger Konsens, sogar unter den ganz unterschiedlichen Archäologien, die wir von einem Ende des europäischen Kontinents (oder sogar darüber hinaus) bis zum anderen vermerken können. Da es keine allgemeingültigen Regeln gibt, die auf alle möglichen Situationen und Zwänge eingehen können, bleibt die Aufgabe, zumindest fachpolitisch gemeinsam an einem Strang zu ziehen und auf der Arbeitsebene wiederum eine gewisse Variabilität von Problemlösungen zu ermöglichen. Ob man über den beruflichen Ehrenkodex hinaus – der auch nicht eindeutig ist und unterschiedliche Auslegungen zulässt – allgemeine Normen oder gar Gesetze verlangen sollte, soll dahingestellt bleiben; Überregulierungen sind oftmals eher schädlich, weil sie die Tendenz haben, sich eher auf ein Mindestniveau reduzieren zu lassen, und auch weil sie oftmals zu starre Korsetts bilden würden, aus denen man sich nicht in eine positive Richtung befreien kann.

Zudem zeigen uns die Erfahrungen, dass gleiche Gesetze in verschiedenen Ländern oder Bundesländern dennoch unterschiedliche Ausführungen erlauben und somit auch variable Herangehensweisen zulassen. Andererseits gibt es wiederum Länder oder Bundesländer mit unterschiedlichen Gesetzgebungen, die durchaus

einen vergleichbaren Umgang ermöglichen und praktizieren. Es liegt also nicht so sehr an der Gesetzgebung – auch wenn das manchmal die Sache etwas erleichtern, allerdings aber auch erschweren kann –, sondern ist Resultat einer ganzen Palette von persönlichen bis hin zu politischen Entscheidungen.

IV. Prospektionsmethoden

Der Wert der sogenannten weichen oder sanften Prospektionsmethoden ist unbestritten groß, gerade wenn es um die Erlangung von zusätzlichen Informationen zu schon bekannten Siedlungsspuren geht. Manchmal eignen sie sich in der Tat dafür, Fundstellen ausfindig zu machen – das kann man an den zahlreichen Neuentdeckungen z.B. der Luftbildarchäologie nach 1990 im Osten Europas deutlich erkennen (Braasch 1996). Aber sie eignen sich eben nur manchmal, so dass der positive Nachweis zwar oftmals stimmt, der negative Beweis jedoch keinesfalls verlässlich ist. Insoweit können die per se wichtigen, nicht invasiven, nicht zerstörerischen Methoden gerade dort nicht als Prospektionsmethoden dienen, wo es um Maßnahmen geht, die ohnehin zu einer unumkehrbaren flächigen Zerstörung führen. Das Risiko

wäre dabei zu groß, denn man kann zwar, muss aber mit Luftbilderkundung, Feldbegehungen oder geophysikalische Methoden nicht zwingend Erfolg haben, auch wenn archäologische Befunde tatsächlich noch vorhanden sind, d.h. man kann sich nicht allein darauf verlassen.

Spätestens jetzt kommen auch noch die zeitlichen und finanziellen Aspekte ins Spiel: Nach einer langen und kostspieligen Phase der Analyse mit der Hilfe von sogenannten weichen Prospektionsmethoden fehlen einem entweder die Zeit oder das Geld, im schlimmsten Fall sogar beides, und man muss sich bei den konkreten Rettungsmaßnahmen für eine A-priori-Auswahl entscheiden. Dass die Entscheidung nach bestem Wissen und Gewissen fällt, ist unumstritten; aber es muss auch klar sein, dass das bestenfalls nach dem aktuellsten Stand der Forschung geschehen kann. Das jedoch ist in vielen Fällen zu wenig und wäre für manche besondere Situationen bzw. für manche Siedlungsreste unwiederbringlich zu spät.

Insoweit kann und muss man für die etwas radikalere Lösung plädieren, die zumindest für derartige Großprojekte eine konsequent durchgeführte harte Prospektion fordert (Abb. 1.4). Zusätzlich geht es um die Überzeugung, dass es sich für alle, die sich mit der Archäologie beschäftigen, lohnt, bei den Investoren und

Abb. 1.4: Die sogenannte harte Prospektionsmethode, wie sie beispielsweise auf der geplanten Neubautrasse der Bahn bei Weinböhla, Lkr. Meißen im Zuge der Datenerhebung für die Umweltverträglichkeitsprüfung angewandt wurde: 25–30 % der Bedarfsfläche (Trasse wie sonstige benötigte Flächen) waren archäologiegerecht abzutragen.



Politikern dafür zu kämpfen. Auch soll diese Vorgehensweise die negative Aura verlieren, dass es sich dabei nur um eine destruktive Methode handelt. Zumindest was die denkmalpflegerisch bedingten Großprojekte betrifft, um die es hier geht, kann das insoweit keinesfalls stimmen, als die betroffenen Flächen ohnehin zerstört werden – mit oder ohne untersuchte, bekannte oder unbekannte archäologische Fundstellen.

Es geht hier deshalb keinesfalls darum, gegen die im Gegenzug als sanft bezeichneten Prospektionsmetho-

den ins Feld zu ziehen, sondern lediglich darum, zu überzeugen, dass diese für die meisten Situationen von denkmalpflegerisch bedingten Projekten schlichtweg die falschen Methoden sind. Daher muss man sich gut überlegen, wo man welche Ressourcen am besten gewinnbringend einsetzt und sollte sich nicht nur durch modische, wissenschaftlich klingende, aber noch lange nicht ausgeklügelte Methoden und verstandene Resultate (de Vries 2008) von der tatsächlichen Dokumentation ablenken.

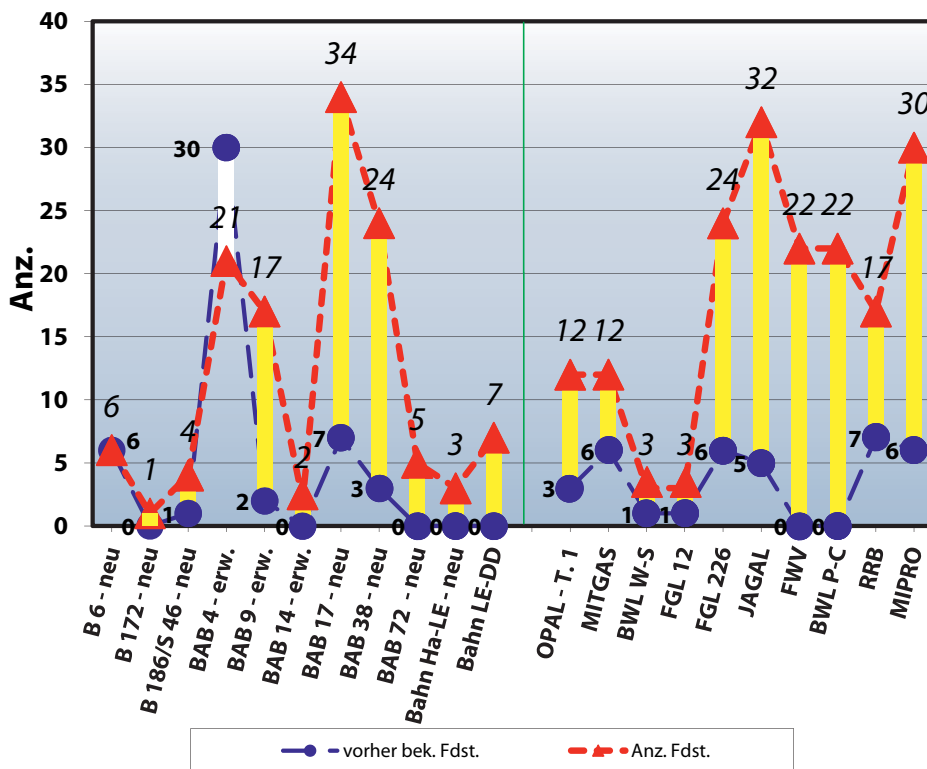
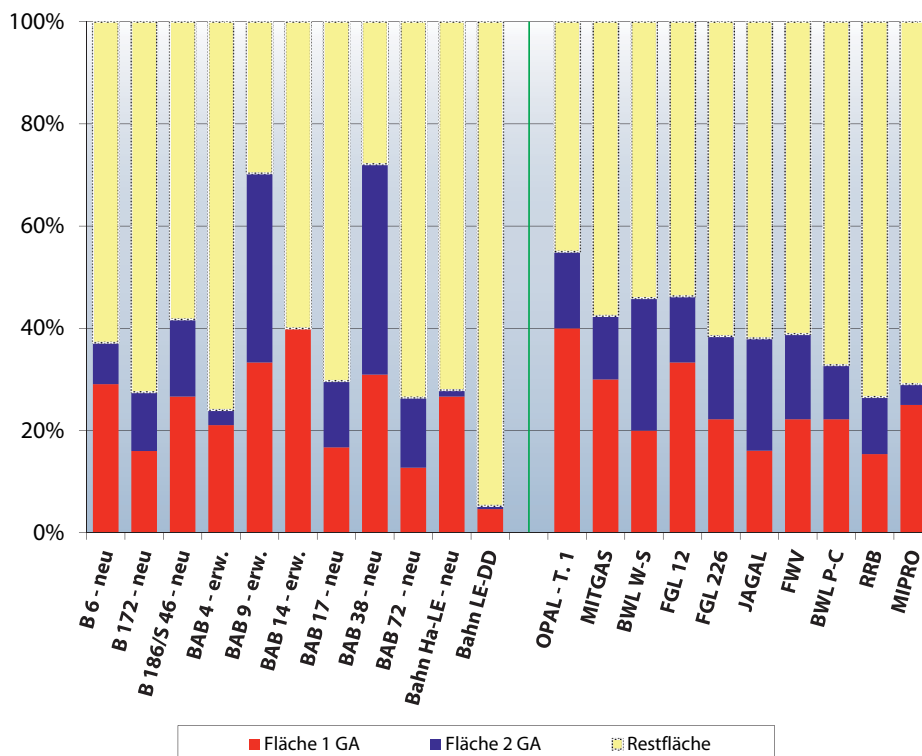


Abb. 1.5a, b:
a Aufstellung der vorher bekannten archäologischen Fundstellen und der vorher nicht bekannten, die erst bei den konkreten Untersuchungen der gesamten Trassenlänge von Linearen Bau-
projekten zutage traten.
b Prozentuales Verhältnis zwischen beanspruchten und untersuchten Flächen.



Die häufig ins Spiel gebrachte Argumentation, die vorher unbekannten Denkmale, die erst durch den erzwungenen Zufall der kompletten archäologischen Betreuung z.B. linearer Projekte neu angetroffen (Abb. 1.5) werden, seien – bei gut erforschten Kulturen wohl gemerkt – statistisch irrelevant, ist jedoch nur eine Frage des Maßstabs. Die Argumentation kann aber, je nach Kontext und Fragestellung, durchaus weitreichende negative Konsequenzen haben: Zwar wird sie vielleicht eine globale oder auch nur europäische Sicht tatsächlich nicht ins Wanken bringen, aber aus lokaler und sogar regionaler Sicht, ganz zu schweigen auf Siedlungsebene, wäre sowohl der reine Denkmalverlust – der wohl gemerkt neben den sonstigen, alltäglich zustande kommenden auch nur schleichenden Zerstörungen immer ein zusätzlicher ist – fatal, als auch der Verlust der dahinter verborgenen Informationen, die immer ein wichtiger Baustein für die weitere Forschung sind, sei es in der Bestätigung, aber vor allem, wenn aufgestellte Thesen widerlegt werden. Letzteres wird allerdings leider zu selten gewollt.

Schon gar nicht kann man die leider ernsthaft geführte Diskussion vor dem Hintergrund verstehen, dass immer von Neuem bestätigt wird, dass wir höchstens 10–30 % des nachweisbaren Bestandes kennen, d.h. dass das Verhältnis zwischen bekannten und unbekannten Fundstellen im Mittel etwa 1:5 beträgt – und dabei sind die mehrfach belegten, polykulturellen Fundstellen gar nicht berücksichtigt (Abb. 1.5b). Insoweit sollte sich auch die Diskussion über eine Unterschutzstellung der in den Denkmalinventarisierungen besser oder schlechter bekannten, aber auf jeden Fall stets unvollständigen Flächendenkmale erübrigen, wenn sie dem Zweck dienen sollte, die betreffende Bau- oder Abbaumaßnahme zu vermeiden, zu verschieben oder umzuleiten. Und zwar nicht, weil es unmöglich oder zu teuer wäre – wenn im Verfahren rechtzeitig angemeldet –, sondern weil es in der Regel keinen Erfolg haben kann. Denn weder kann eine exquisite Denkmalinventarisierung, noch können die zahlreichen Modi ausgeklügelter prädiktiver Modelle bzw. von Verdachtsflächenanalysen, die ja alle stets auf einem gewissen aktuellen Forschungsstand beruhen, definitiv garantieren, dass auf diese Art nicht eventuell sogar mehr zerstört als gerettet wird. Man würde Eingriffe in bekannte Denkmale bzw. deren Ausgrabungen vermeiden, indem man bis dato unbekannte Fundstellen opfert, z.T. ungesehen oder unbeobachtet oder zumindest nicht mehr adäquat untersucht. Die potenziell besonderen Qualitäten solcher unbekannter Fundstellen würden meist nicht einmal erkannt werden können. Dabei wissen wir theoretisch schon längst, dass, je besser sich eine Fundstelle an der Oberfläche zeigt, sie umso schlechter erhalten ist. Untersucht man nur jene archäologischen Flächen, die man daher kennt oder nach gängigem Wissen einschätzt, so nimmt man sich die Chance, dieses Wissen bzw. das zugrunde liegende Modell zu prüfen: ein klassischer Zirkelschluss, bei dem die Resultate kaum jemals über die vorausgesetzten Angaben hinaus reichen können.

Abb. 1.6: Wichtige Dichotomien, die nicht als Gegensätze oder Widersprüche zu verstehen oder zu nutzen sind, sondern eher als Extreme einer Vielzahl möglicher Zwischenaspekte.

V. Der Wert der Großprojekte für die archäologische Forschung

Damit wäre man beim besonderen Wert der Großprojekte für die archäologische Forschung angekommen: Die Erkenntnisse, die aus der nicht voreingenommenen und konsequenten Untersuchung gerade der linearen Bauvorhaben gewonnen werden können, bieten die besondere, wenn nicht sogar einzigartige Gelegenheit, bestehende wissenschaftliche Modelle zu prüfen, zu hinterfragen und gegebenenfalls zu korrigieren oder gar ganz zu ändern. Denn nur mithilfe derartiger Projekte können Flächen untersucht werden, die bis dahin mit einer geringen archäologischen Höflichkeit bedacht waren (de Vries 2008). Dabei zeigte sich in der Praxis bedenklich oft, dass mit einer deutlichen Ergänzung bis hin zu einer Umkehrung der Datenlage zu rechnen ist (Stäuble et al. 2011).

Doch der Wert dieser neuen, zufällig entdeckten archäologischen Fundstellen erschöpft sich nicht in der bloßen Anzahl – wenngleich auch diese Informationen niemals alleine stehen, sondern stets mit landschaftsbezogenen Erkenntnissen einhergehen –, sondern besteht auch in der Chance, nicht nur die Siedlungen selbst, sondern auch deren Aktivitätsbereiche großräumig zu erfassen. Gleichzeitig besteht sicherlich auch das Risiko, mit der Trasse nur die Peripherie einer Siedlung zu tangieren. Doch gerade diese Schwäche ist zugleich auch die Stärke und einer der Vorteile der vom archäologischen Gesichtspunkt aus zufallsbedingten Trassierung einer Pipeline oder Straße: Man könnte sich bei der Erforschung einer bekannten Siedlung ansonsten kaum leisten, sich gezielt auf die wenig dicht besiedelten Areale oder auf die Zwischenräume von Siedlungen zu konzentrieren. Dadurch kann es durchaus vorkommen, dass man damit eine Reihe von Fund- und Befundkategorien verpasst, die eventuell fern vom Siedlungskern liegen, wie z.B. linienbandkeramische Brunnen. In der Reihe der Gegenüberstellungen (Abb. 1.6), die als Grundlage für diesen Vortrag nicht als Gegensätze, sondern mit dem Zweck aufgestellt wurden, eine Spannbreite anzuzeigen, in der alle Zwischentöne wie auch die Extreme ihre Gültigkeit haben, kommt man gezwungenermaßen auch auf das Verhältnis zwischen den sich mit archäologischen Themen befassenden In-

Schutz – Zerstörung
Erhalt – Ausgrabung
gesetzliche Regelung – pragmatische Arbeit
„non-destructive“ – „destructive methods“
sanfte – harte Prospektion
bekannte – unbekannte Fundstellen
Umleiten – Ausgraben
Universität – Denkmalpflege/Museum
kleine – große Flächen
gezielte – zufällige Grabungsausschnitte
Zentrum – Peripherie
direkte Beprobung – Zufallsprobe
Regel – Ausnahme
Erwartetes – Unerwartetes
Theorie – Praxis

stitutionen zu sprechen: zwischen den Universitäten, Museen und der archäologischen Denkmalpflege. Allerdings verbietet es sich auch hierbei, das Verhältnis auf die übliche, manchmal kontradiktorische Gegenüberstellung einzuzwingen, sondern man muss diese falsche Dichotomie überwinden. Neben den selbstverständlich unterschiedlichen Aufgaben, die diese Insti-

tutionen jeweils erfüllen müssen, würde eine zu starke Differenzierung, Abgrenzung oder gar Trennung der Ziele nämlich nur jenen Hilfestellung leisten, die das zu Ungunsten der Archäologie ausspielen könnten. Dennoch sind bezüglich der Ausgrabungen und Forschungen auf allen Seiten sowohl einengende Bedingungen, aber auch zahlreiche Möglichkeiten gegeben, die spe-

Pipelines

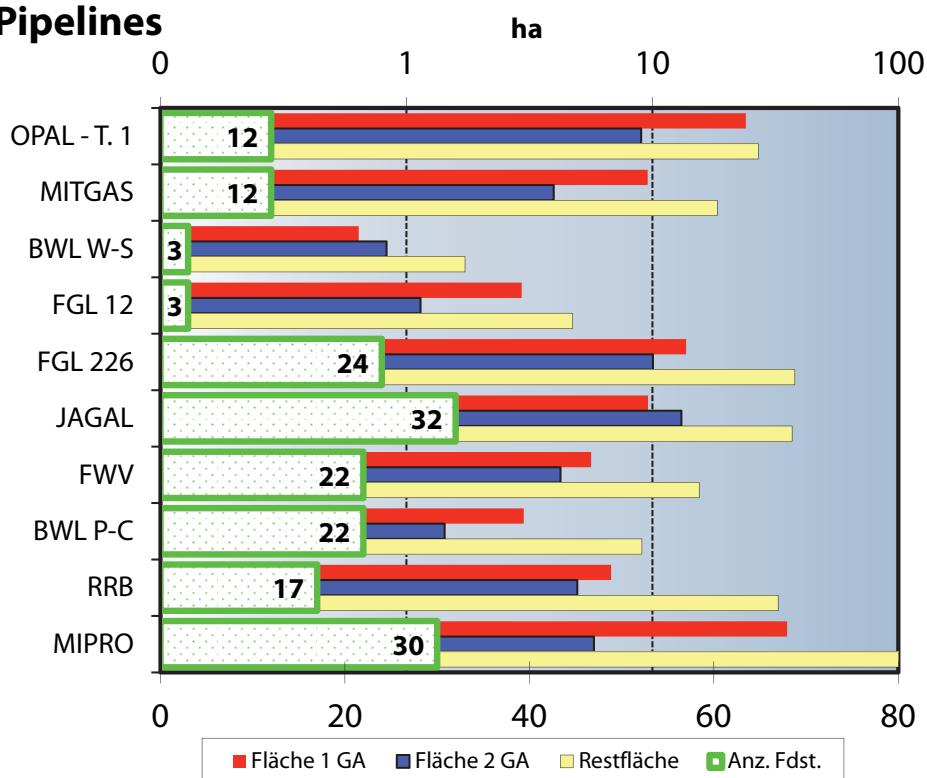
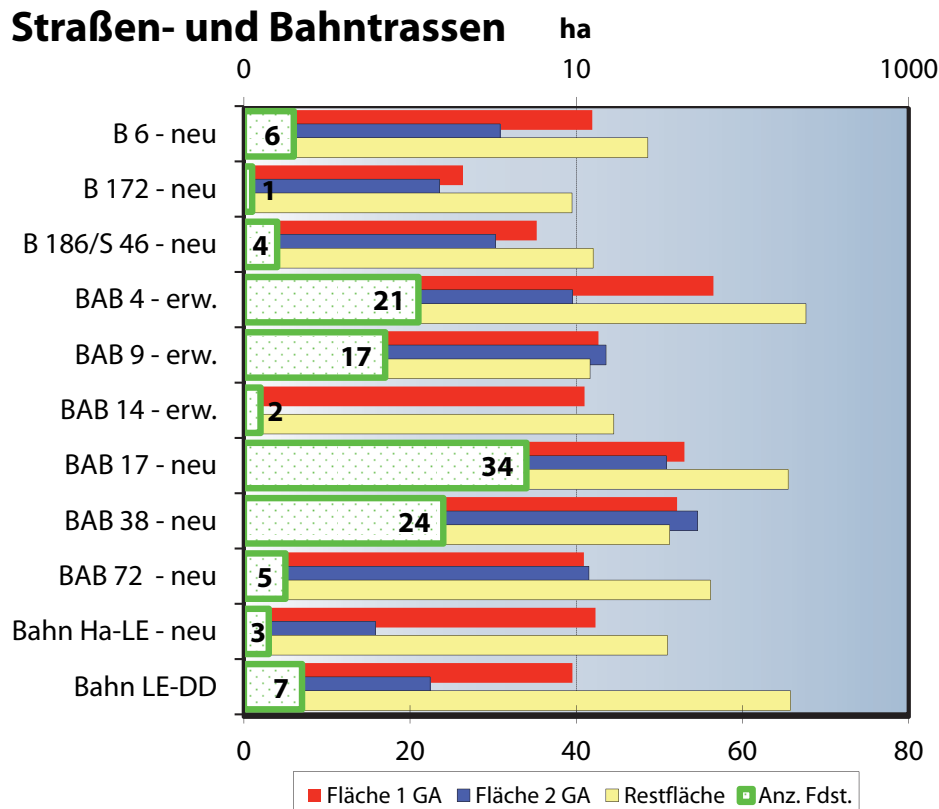


Abb. 1.7a, b: Verhältnisse zwischen den Größen der durch harte Prospektion untersuchten Flächen (Fläche 1. GA), der tatsächlichen Ausgrabungsflächen (Fläche 2. GA) aller dabei angetroffenen Fundstellen (tatsächl. Fundstellen) sowie die Differenz zu den insgesamt für den Bau der Maßnahme benötigten Eingriffen (Restflächen) – a bei Pipelines, b bei Straßen- und Bahntrassen.

Straßen- und Bahntrassen



zifisch sind und sich demnach ergänzen sollten! Auf der einen, der universitären Seite ist es der bestehende Lehrplan, die meist auf die Ferienzeit beschränkte Grabungsdauer, die Tatsache, dass es sich um Lehrgrabungen – mit allen Vorteilen, die sich in der Auswertung manchmal aber auch als Nachteil zeigen – handelt. Nicht zuletzt sind die Projekte finanziell vergleichsweise recht eingeschränkt, d.h. sie erlauben meist nur kurze Grabungssaisons und kleine Untersuchungsflächen. Dafür besteht dabei eventuell die Möglichkeit, mehr Zeit für die Aufarbeitung zu haben und mehr ins Detail gehende Untersuchungen anzustellen. Auf der anderen, denkmalpflegerischen Seite geht es gerade bei den Großprojekten meist um riesige Areale, die untersucht werden müssen bzw. für eine Untersuchung zur Verfügung stehen. Deren Ausgrabung erfordert einen professionelleren Umgang, bei dem aber häufig nicht so stark ins Detail gegangen werden kann; es besteht viel Zeitdruck, die Ausgrabungen müssen oftmals zu jeder Jahreszeit stattfinden – mit allen potenziell negativen Konsequenzen. Auch die Aufarbeitungszeit ist in der Regel und im Verhältnis zur Grabungszeit und -fläche deutlich geringer, wobei man hier tatsächlich auch differenzieren muss zwischen der unmittelbaren Fertigstellung der Dokumentation nach der Ausgrabung selbst und der tatsächlichen Bearbeitung, die in beiden Fällen meist erst nachträglich erfolgt. Als positives Modell für eine gelungene Zusammenarbeit kann die seit den 1960er Jahren erfolgreich betriebene Braunkohlenarchäologie im Rheinland erwähnt werden, ohne die beispielsweise die Erforschung der Linienbandkeramik gar nicht vorstellbar wäre.

Je dichter das untersuchte Netz ist bzw. je mehr Fläche man tatsächlich öffnet, desto stärker erhöht sich die Chance, nicht nur mehr Wissen, sondern vor allem auch vielfältiges Wissen zu erlangen, d.h. auch viel Unerwartetes, Unkonventionelles bzw. bis dahin Unbekanntes zu finden (Abb. 1.7). Zwar kann man auch über viele kleine, punktuelle und dann vielleicht auch sehr detaillierte Untersuchungen einige neue Erkenntnisse gewinnen, doch sind es meist die linearen und großflächigen Projekte, bei denen sich die Wahrscheinlichkeit dafür beträchtlich erhöht. Es ist, wie schon erwähnt, daher nicht nur eine Frage der Quantität, d.h. des Fundstellen- oder Fundmaterialzuwachses, sondern vor allem auch eine der Vielfalt und daher auch der wissenschaftlichen Qualität, die durch die Untersuchungen großer Flächen hinzukommt. Wenn man stets das Gleiche untersucht bzw. wenn man nur nach den gängigen bzw. bekannten Mustern sucht, können zwar detaillierte und besser begründete Informationen erzielt werden. Ein offenes System, das richtige Änderungen des bis dahin Bekannten und somit einen Fortschritt erlaubt, kann es dabei aber nur selten geben. Da man mit Forschungsgeldern nur selten größere Flächen untersuchen kann, weil es sowohl an Zeit als auch an Geld fehlt, muss man sich dabei möglichst ein sicheres Terrain aussuchen, und das wird die gedacht am besten erhaltene Stelle sein, in der man mit größter Wahrscheinlichkeit einen Treffer landet. Wie detailliert man das nun auch macht und dadurch auch zu feineren Kontext-Angaben kommt, es bleibt was es ist: eine kleine Probenentnahme, nicht etwa aus einer einheitlichen Masse, sondern von einem ungleichmäßig verteilten Material, eine Probe, die selten repräsentativ sein kann, ja sogar – je nach Aus-

gangshypothese – vielleicht nicht einmal repräsentativ sein darf.

Den sich stets verändernden Denkmalbestand und Forschungsstand und die damit in Verbindung stehenden Modellierungsversuche der prädiktiven Methoden oder Verdachtsflächenanalysen habe ich schon erwähnt – die Diskussion über deren Güte, d.h. die Verlässlichkeit der Methoden wird schon seit langem durchaus kontradiktorisch geführt. Hier soll lediglich auf den in der Definition integrierten Modellcharakter dieser Methoden hingewiesen werden. Dabei sollte man sich eher der zufälligen Resultate der Großprojektgrabungen für neue Modellbildungen bedienen, anstatt altbewährte Modelle dafür zu nutzen, die denkmalpflegerischen Untersuchungen selektiv einzuschränken! Das ist die eigentliche Chance und die Besonderheit der denkmalpflegerisch bedingten Großgrabungen: ihre Qualität, geographische und archäologische Gebiete weiträumig zu überspannen oder zu umfassen, und zudem der wissenschaftlichen Anforderung eines „random sampling“ zu genügen. Es können damit alle Zeiten, alle funktional unterschiedlichen archäologischen Überreste in allen erwarteten oder unerwarteten Siedlungsbereichen oder geographischen Regionen unabhängig von einem aktuellen Interesse oder Schwerpunkt erfasst werden.

Anmerkung:

Da ein Beitrag zum sächsischen Weg in der archäologischen Behandlung von Großprojekten kürzlich erschienen ist (Stäuble et al. 2011) wurde der am 7. 10. 2008 in Esslingen gehaltene Vortrag nicht um Fallstudien erweitert, sondern lediglich korrigiert und um einige ausgewählte Literaturhinweise ergänzt.

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2 | Weaving Strands: Integrating excavations, landscapes and the human past along the A1 major road in East Lothian, Scotland

Olivia Lelong and Gavin MacGregor

Abstract: This paper considers some of the problems with the traditional approach to the excavation, analysis and publication of the archaeology of large infrastructure projects. These have until recently been conceived in terms of an exercise in data capture to achieve ‘preservation by record’. In contrast, it considers the example of the approach taken to the analysis and publication of the archaeological works on the A1 major road in East Lothian, Scotland, which was funded by the Scottish Executive Roads Department and monitored by Historic Scotland. Ultimately, it is suggested that the *raison d’être* of developer-led archaeology – including excavation – should be considered creation of social knowledge through research.

Field practice and the construction of archaeological narratives

The changing historical context of archaeological practice is fundamental to understanding our *raison d’être* as a profession, and in this light we have to recollect that only about 20 years ago did the ‘polluter pays’ principle lead to the formal emergence of contract- or developer-funded archaeology in Britain. Prior to this, most excavation (apart from occasional salvage or rescue excavations) was essentially research-driven – undertaken to answer pre-formulated research questions – and the resulting evidence fed directly into wider academic discourse. Over the past 20 years, the notion of preservation (or mitigation) by record – in other words, preventive archaeology – has governed both field practice and the publication of large-scale excavations in Britain. It is essentially concerned with preserving archaeological sites by converting them into archivable data. Its underlying principles seek to ensure that, especially where archaeological sites are being destroyed through development, the information about the past that they represent is transformed into a faithful and detailed record of the remains. Certain fallacies inherent in the concept, however, have limited the meaningful contribution of such interventions to wider research.

The concept of ‘preservation by record’ has until recently been enshrined in government planning policy guidelines in Scotland (NPPG 5; SPP 23) and this is still the case in other parts of the United Kingdom (e.g. PPG 16, although this is soon to be altered). While the phrase itself is gradually being replaced in policy documents, the concept still provides the foundation for much archaeological practice in the UK. The main fallacy of this concept is in presuming that the records made during excavations can stand in place of archaeology which has been destroyed, thereby somehow preserving it (see Andrews et al. 2000). The unintended result is that higher level interpretations of human practice, if they are made at all, are often deferred until post-excavation analysis and publication, rather than integrated with field recording. All too frequently, the large data sets produced through

excavations are not exploited to their full potential for interpretation. In this paper we explore the reasons for this failure and some potential solutions.

As the pace of development has increased in recent years, and especially with the galloping rate of linear route developments in many European countries, open-area excavations have increased dramatically in number and in scale. This has resulted in the investigation and recording of many rich, complex and fascinating sets of archaeological remains. Such field projects in turn produce huge data sets that can be challenging to publish, sometimes languishing for years as archives. When they are published, they often appear as thick excavation reports packed with descriptions of material remains, artefacts and environmental evidence, with interpretation tacked on in concluding chapters. This separation between description and interpretation in published reports reflects the mindset of ‘preservation by record’, which relies on excavation records to represent the archaeology itself. The problem lies essentially not in recording systems themselves, but in the ways that we as archaeologists decide how best to produce knowledge. Behind this issue lie questions about what constitute valid forms of knowledge and understanding, and to whom we should be most concerned with communicating this knowledge.

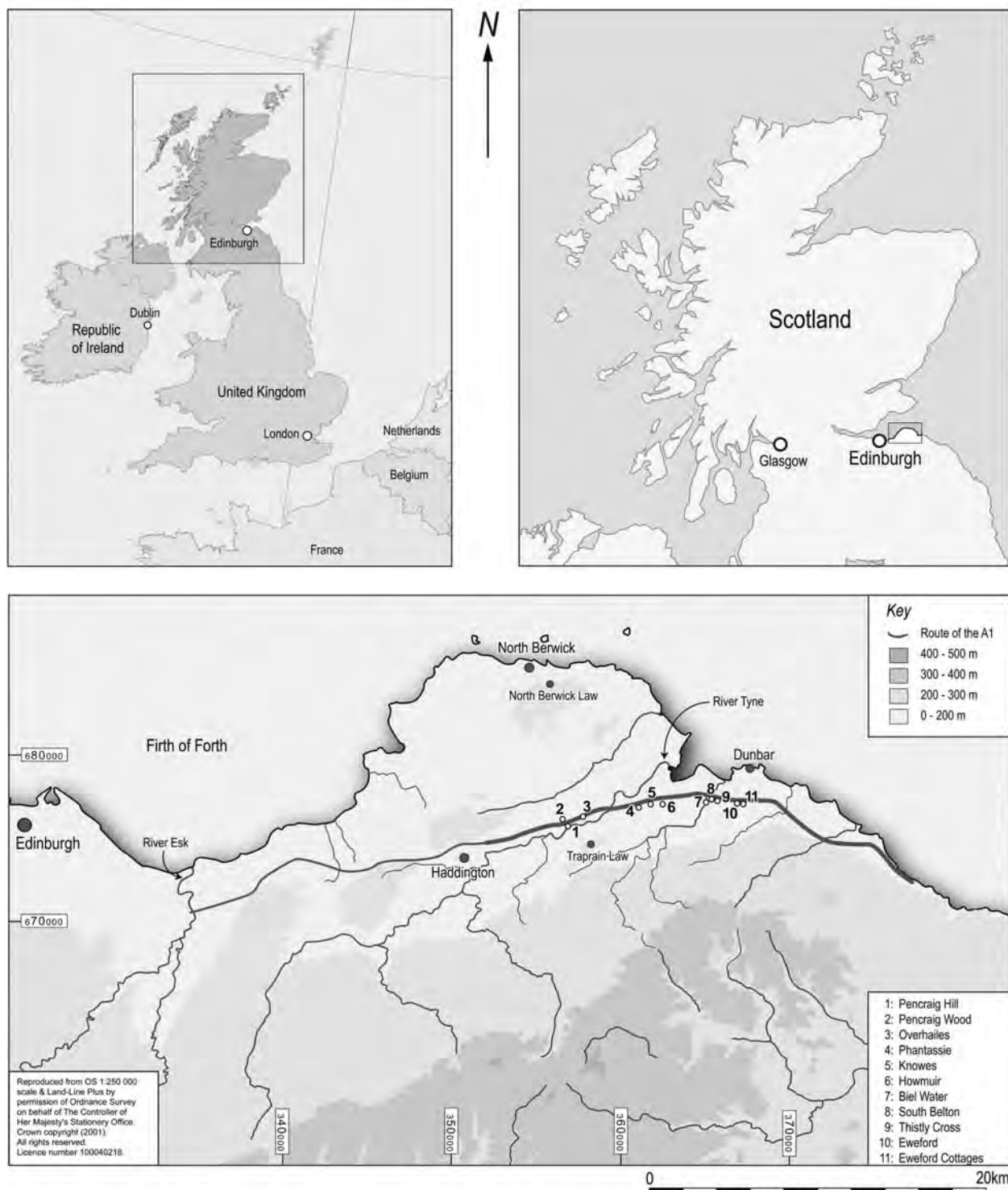
Recent critiques have tended to caricature current, mainstream archaeological practice as a technical exercise in recovering data, in which archaeologists exclude human agency and practice from their field recording and interpretation and only later attempt to reunite the record of material remains with the humanity that created them (see, for example, Andrews et al. 2000, 527). While this deferral of interpretation does often take place in practice, it does so because the concepts and parameters that frame our practice allow it, rather than require it; this is particularly true of the prevailing parameters for publication.

We would argue that all excavation is the collection of data for the purpose of explaining the past. We exca-

vate in order to understand how sites formed through people's actions and what their actions meant in the context of their routine lives, their social relations and their beliefs about the world. All excavation is therefore research, and higher level interpretation is not the preserve of academic archaeologists, but of archaeologists everywhere. We collect data in order to construct archaeological narratives, and this should have implications both for the content and the form of our publications (cf. Joyce 2002). However, this larger purpose is often misplaced or pushed aside in the process of preparing data-rich publications. Large-scale excavations

generate correspondingly large amounts of complex information, with equally heavy obligations to publish it in meaningful ways. They present us with even greater opportunities to maximise the interpretation of this data. The interpretation of human practice and the construction of historical narratives should, and often do, flow directly from excavation and field recording. The problem, we argue, lies mainly in the format of traditional excavation reports, which often constrain higher level interpretation through their demands for data. Such accounts rehearse the data captured in the record, but they fail to explain what happened in the

Fig. 2.1: Location map.



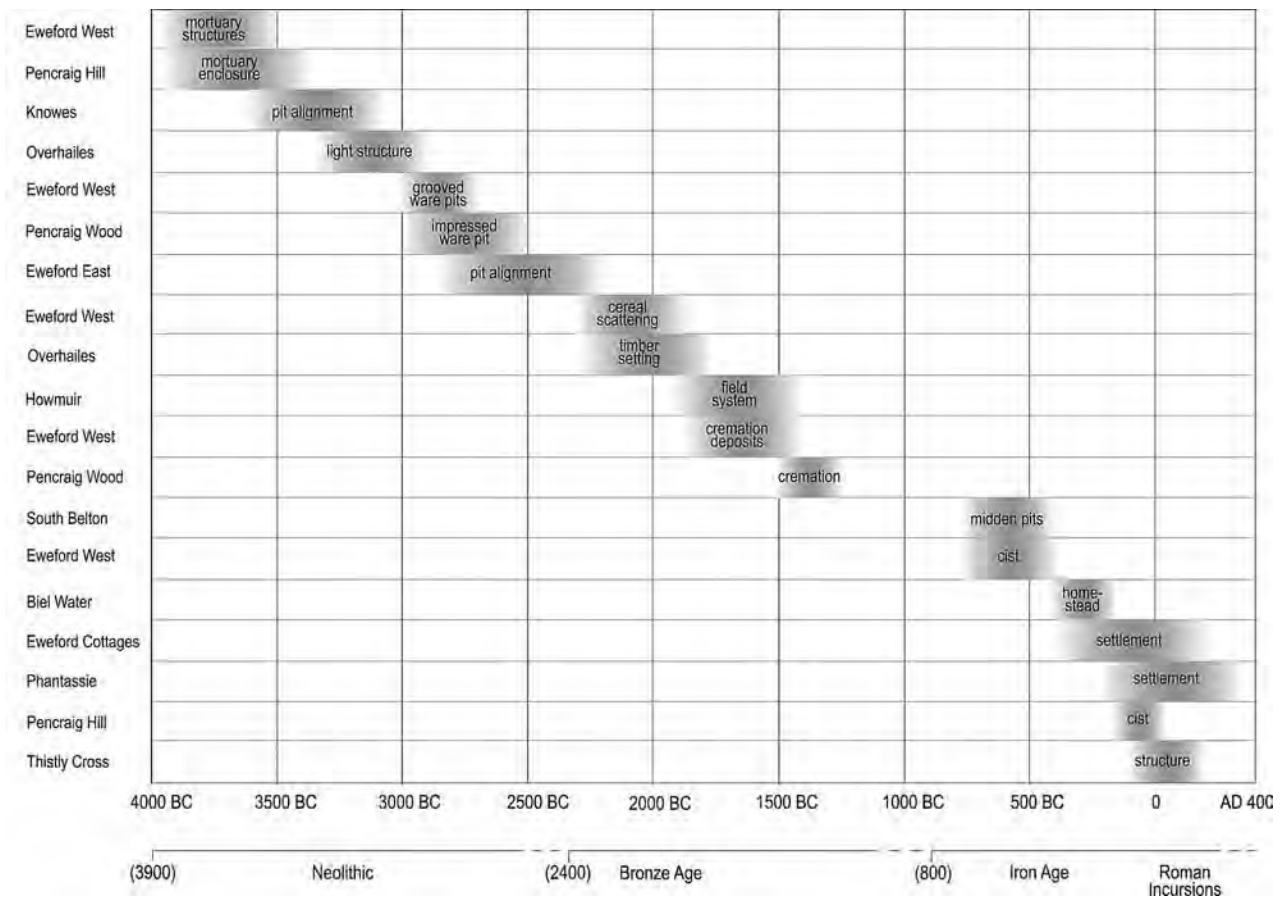


Fig. 2.2: Timeline showing the calibrated date spans of the excavated A1 sites.

past on a human scale. If such explanation is the objective of excavation, it should also be the point of archaeological publication. We address these issues through the example of the A1 road upgrade excavations in south-east Scotland.

Foundations for publication of the A1 excavations

The A1 road runs along the coastal plain to the east of Edinburgh, in a region known as East Lothian, taking traffic through south-east Scotland towards northern England. Parts of the road have recently been upgraded to dual carriageway (or divided highway) (see fig. 2.1). From 2001 to 2003, the former Glasgow University Archaeological Research Division (GUARD) carried out investigations along a 20-kilometre section in advance of the upgrade, to mitigate the impact of the road's construction on the archaeological resource. The route was designed to avoid almost all of the known archaeology, except for two prehistoric crop-mark sites at Eweford. Different methodologies were employed for different parts of the road corridor. Most of it was evaluated through trial trenches amounting to a five per cent sample, but this sample size increased to between ten and thirty per cent in areas of greater sensitivity. Two previously known sites were excavated, along with nine discovered through trial trenching and topsoil strip monitoring. The work was funded by the Scottish Executive Roads Department and monitored by Historic Scotland, who encouraged us to explore fresh ways of presenting the results.

The excavated sites ranged in date from the early fourth millennium B.C. to the early first millennium A.D. (fig. 2.2). In traditional terms they consisted of a Neolithic mortuary enclosure, a Neolithic and Bronze Age ceremonial complex, two Neolithic pit alignments, a Neolithic settlement, two Bronze Age cremation cemeteries, an early Iron Age field system, a small middle Iron Age settlement and refuse pits, a large Iron Age enclosed settlement and a Roman Iron Age farmstead. Several of the sites had traces of earlier, Mesolithic activity in the form of microliths and radiocarbon dates, and there was evidence that some places had been revisited and re-used over several millennia.

The results were published in 2008 in a monograph called *The Lands of Ancient Lothian: Interpreting the archaeology of the A1* (Lelong & MacGregor 2008). In planning the post-excavation work and especially the publication, we considered various options. Linear route projects such as roads and pipelines present valuable opportunities for the archaeological examination of large transects of land, opportunities which have been rather unevenly exploited in the past. Some early archaeological programmes structured around linear developments have recognised the value of moving outward from individual sites and 'setting sites and monuments within their contemporary landscape' (Fasham 1988, 83). Others took a wider view in terms of understanding and contrasting the character of human activity over long periods of time (for example, Mudd 1999). However, there remain many examples of excavations reported individually within one volume, like beads on a string (for example, Catherall et al. 1984;

Price et al. 1997). Such site-focused reports often only briefly consider the environs of sites and the relationships between them. Some projects which do move beyond the sites themselves to more specifically address the surrounding areas – contrasting upland and lowland regions, for example (see Lambert 1996; Vyner 2001) – remain limited in scope, focusing on the environs of the infrastructure project rather than on the changing landscapes which people inhabited in the past.

This variety in approaches to linear route projects reflects the challenges inherent in relating excavated sites to their past environs. This is partly because the very concept of a 'site' is deeply problematic. The extent and nature of past human activity in one particular place are difficult to define, and many sites produce evidence of several phases of activity, whether continuous or intermittent (Foley 1981; Dunnell 1992; Carman 1999). The problems we encounter in defining 'sites' stem from our attempts to define the spatial and temporal boundaries of past human activity. The concept of 'site' is a useful tool that allows us to define places where certain things happened in the past. However, it can also be limited and limiting. People's episodes of activity at particular places were not usually strictly bounded; they were linked to other routines that reached out into surrounding spaces. Their actions could also possess considerable temporal depth. They arose from earlier traditions or memories and from historically shared perceptions about the world, and subsequent generations often returned to places of old significance to honour traditions or reinvent them for new purposes.

Given this, it seems that a sound approach to archaeological remains excavated along a linear route – or indeed anywhere – is to ask how individual sites illuminate what people did in the landscape that contains them. In the simplest of terms, we wanted to know what had happened at the places we excavated along the A1. In more complex terms, we wanted to understand how people had known and inhabited East Lothian at different times in the prehistoric past: the routine activities that moved their lives forward, the meanings they gave to the world, and the physical and cosmological legacy that each generation left for the next one. We sought to understand human practice in that landscape, not just the formation of the individual sites.

Planning the publication, we soon realised that the format of the traditional excavation report would not allow us to explore and understand human practice in this way. Our aims had implications for how we would write and structure the volume, beginning with the problems surrounding the concept of 'site' outlined above. We found ourselves revisiting several other concepts, including that of landscape. The term landscape is a complex and often over-used one, and it is notoriously difficult to define. We understand it to mean not simply physical topography or space, preferring the terms area, region or environs for that purpose. We understand landscape to mean the cultural environment, a dynamic interface between people and land. A landscape consists of complex interactions between topography, geology, climate, soils, animals and plants, people's perceptions about those things, and their actions in space and time. A landscape is therefore constantly changing, sometimes quickly and sometimes

very slowly, through the results of natural processes and human thought and action. When we study an archaeological landscape, we are studying the evidence for the changing nature of these dynamic interactions – not a single landscape, then, but landscapes.

In order to realise the full interpretative potential of the five thousand years of human activity represented along the A1, we tried to extract the story of what people did at each place over time, but also to investigate how these site-specific activities related to the wider physical and cultural environment – in short, to explore each site's contemporary setting, as well as the landscapes that connected various sites at different times. This involved considering not just the topography, geology and other natural features of the land, but how people engaged with their environment at different times. The landscapes of the A1 were imbued with different associations, meanings and memories in pre-history; they had cosmological aspects, deriving from the beliefs people held about the world, and historic aspects, deriving from the stories people told about the past. These landscapes did not consist simply of physical spaces, nor did they exist wholly in human perception, but were the places where physical space and perception coincided (Ingold 1993).

People's actions in prehistoric Lothian were motivated by economic, political, social and symbolic concerns, and all of these aspects of life had potential effects upon the contemporary landscape. For example, felling trees in the prehistoric past might have been motivated by the desire to create fields for cultivation; to obtain fuel or building materials for houses or ceremonial structures; to clear views for aesthetic reasons or religious beliefs, or to reveal named topographic features. Small episodes of clearance might have had incremental effects over several generations, eventually and radically changing the character of the landscape by removing forest cover. In turn, the uses of the felled timber would have had effects upon the natural and built environment, whether that timber was burned in advance of cultivation, altering the soil chemistry and vegetation, or was taken away for use in construction. Its use in building projects created other chains of interaction, in how buildings were erected, the spaces they framed and what took place inside and around them, and the traces left in the soil through their use and abandonment or destruction.

We also recognise that people were not necessarily free to act however they liked. Their behaviour was bound by certain physical, social and conceptual constraints. To ward off hunger and death, for example, members of communities had to do certain things at certain times: milk livestock, sow seeds, harvest crops and so on. Social constraints were equally powerful. Imbalanced power relations would have given some greater authority and bound others in servitude or even slavery, and social conventions may have barred some members (based on age, gender, status or roles) from doing certain things. Beliefs about the spirit world, including the dead, may have also directed or constrained behaviour; people probably saw it as imperative to act in certain ways or to build certain monuments to ensure spiritual safety. Many of the daily, seasonal and annual routines of people's lives in East Lothian centred on their dwellings, which contained households and were arranged in settlements according to communities. All of these

social concepts proved useful in interpreting the past, but we recognise that they were never static entities. How people defined household or community at one time may have differed enormously from how a later generation defined it.

These conceptual foundations had important implications for how we would prepare for and write the publication.

First, in order to understand the excavation results in a wider landscape context, we produced a comprehensive review of the region's prehistoric past. This involved collating data from the National Monuments Record of Scotland for all prehistoric remains in the regions, with a project GIS linked to a database. We produced a written review of the region's archaeology and of the prevailing models for interpretation, which was made available to the project team.

We decided to present the excavations not as individual sites, but in an integrated way – in chronological order, according to their period and also according to themes of human practice. Some of the eleven sites are therefore spread across the six excavation chapters. For example, the ceremonial complex at Eweford is presented in three chapters – one on early Neolithic mortuary practice, another on the potency of certain objects in the later Neolithic and a third on the uses of human bone in the Bronze Age. A final four chapters set the evidence from the A1 excavations in the wider geographical context for different periods of prehistory. This allowed our focus to range across the landscape and through time, following changes in human practice. It also permitted different scales of analysis. It allowed us to examine the dwellings, households and communities that created sites and the life ways of people that occupied them, as well as broader trends and processes in society and the concepts and beliefs behind them.

The structure of a narrative can shape its content, and this chronological, integrated and practice-based approach had implications for how the chapters were written – as did our intended audiences. Like many large infrastructure projects, the A1 upgrade attracted media interest and publicity and the results were interesting to a wide range of people, especially local communities. We wanted to write in ways that were accessible to interested readers, beyond an academic and specialist audience. As archaeologists, we are trained to write in very formulaic, technical ways. Many archaeological accounts lead with description of the physical remains that were excavated and follow this with interpretation. They describe archaeological features according to categories of shape, size and character, and they are typically written in the passive voice.

We chose to present the account of what took place at each excavated site in a different way. We led each account with interpretation of how deposits or features had formed through human action (or post-depositional processes), trying to write in clear and succinct terms, and supporting these interpretative statements with selective description of the physical remains. This meant writing in the active voice wherever possible, in order to evoke what people had done in the past. Rather than including full reports on the results of specialist analysis of artefacts and environmental remains, which would have doubled the volume's length, we integrated their results into the excavation accounts. The

specialists contributed text boxes that focus on particular artefacts, activities or processes, adding texture to the stories of human practice that were crafted from the evidence.

For the more synthetic chapters, we did not devote much time or space to classifying the archaeology in terms of site type or to searching for other sites that would provide parallels in shape, size, character and so on. However, we did seek out evidence from other excavations and monuments for comparable practices. This is a subtle difference, but an important one. Typological categories were not necessarily meaningful in the past, and comparisons of site type use up space and resources that can be spent answering more interesting questions.

Weaving strands along the A1

The integrated, thematic approach made space – both in the publication and in our thinking – for long-term perspectives on the changing ways that people had inhabited the landscapes of East Lothian over five millennia. In spite of the great chronological range and the differences between the sites, certain themes emerged that linked distant generations, and it became clear how particular places accumulated meaning as time went on. In the early fourth millennium B.C., as communities were adopting agriculture and new technologies, they were starting to intervene with nature in unprecedented ways: planting seeds, coaxing crops from the earth and managing animals for food. Greater commitment to particular places and concern for group survival may have prompted them to construct massive communal monuments like the mortuary enclosure at Pencraig Hill (fig. 2.3). Human remains were cremated on a pyre inside it before the whole timber enclosure was burnt to the ground. The mortuary enclosure at Eweford West was built on top of two successive long mounds; it also held cremation pyres and was finally burnt down before a third long mound was built over it.

Later in the fourth and during the third millennium B.C., people began defining space in new ways – by building long lines of posts and post-defined enclosures like the one at Eweford East (fig. 2.4). This was built in segments over about 600 years and then burnt down in what must have been a spectacular event. Whatever its ceremonial use, it may have been linked to the seasonal gathering and movement of animals. People were living in smaller, more mobile communities now and focusing more on pastoral agriculture.

During the same period, we see evidence for the perceived potency of certain objects, including human remains. At Overhailes in the late fourth millennium, a group built a light structure. They dug two large pits and filled them with the ashes from cooking fires and with flint tools and decorated pottery that had travelled hundreds of kilometres, from eastern England (fig. 2.5). Another generation came to the same spot about a thousand years later and built a small timber circle or building, filling the post-holes with burnt food remains. Others returned to the ancient long mound at Eweford West over a period of several hundred years to remodel the mound, adding capping and arcs of stone. People also scattered stone tools, Beaker pottery and hundreds of thousands of burnt cereal grains around

the mound – perhaps a sacrifice to ensure a good harvest, or to acknowledge a successful one (fig. 2.6). Placing potent objects in pits or scattering them across the ground echoed the sowing of seeds; it drew on metaphors for fertility and growth.

The long mound at Eweford West continued as a focus for belief and ceremony. During the second millennium B.C., people went there repeatedly to leave the cremated remains of the dead in pits around the mound – sometimes in large, decorated pots or with objects that had passed through the fire (fig. 2.7). They built a stone cairn over the mound and scattered more bone among the stones.

By the middle of the first millennium B.C., communities had shifted their focus onto agriculture and woodland clearance on a bigger scale. Around the middle of the millennium they began constructing substantial settlements in enclosures like the one at Eweford Cottages (fig. 2.8). The digging of ditches and building of ramparts probably went far beyond simple defense; it symbolised a new surge in social cohesion, as communities came together for security, to shore up shared identities and to stake claim to larger tracts of agricultural land. By late in the millennium, however, the ditches of many enclosures were being filled in and the boundaries around settlements were being erased, perhaps

Fig. 2.3: Reconstruction drawing of the Pencraig Hill mortuary enclosure.



Fig. 2.4: Reconstruction drawing of the southern alignment being constructed at Eweford East.



as historical notions of community dissolved. Smaller, unenclosed settlements like the farmstead at Phantassie were built (fig. 2.9); the evidence from here gives a sense of the daily and seasonal routines of the settlement and how they related to the surrounding farming landscape.

Although the Iron Age inhabitants of East Lothian might appear to have invested all their time in settlement building and agricultural efforts, in contrast to building the great ceremonial monuments of earlier millennia, we found evidence to the contrary. They made many small, symbolic gestures that show how their beliefs about the world were interwoven into daily life, like the regular

scattering of cremated human bone around the farmstead at Phantassie. The cremated remains may have been added to the farm's midden heap, to fertilise the fields and help ensure the community's survival. Bone may have also been scattered around the settlement as a way of integrating the dead into its physical fabric. People also perceived domestic midden as potent. They spread it selectively inside the farmstead at Phantassie, using it as a foundation deposit for new buildings; elsewhere they used it to fill enclosure ditches and fundamentally change the nature of their settlements. We see the importance of social memory in the way that people built decorated querns into paving and

Fig. 2.5: Reconstruction drawing of structure A at Overhailes.



Fig. 2.6: Reconstruction drawing of the third-millennium B.C. phase of activity at Eweford West.



wall foundations at Phantassie, Eweford Cottages and other late Iron Age settlements, as powerful symbols of the life and health of the family (fig. 2.10). We also see the remarkable strength of oral tradition in the way that Iron Age communities returned to the Neolithic mortuary sites at Eweford West and Pencraig Hill. In the mid first millennium B.C. and early first millennium A.D., they constructed small stone coffins in pits (known as cists) to hold human remains, both times in places that demonstrated detailed knowledge of the original form of these ancient monuments (fig. 2.11).

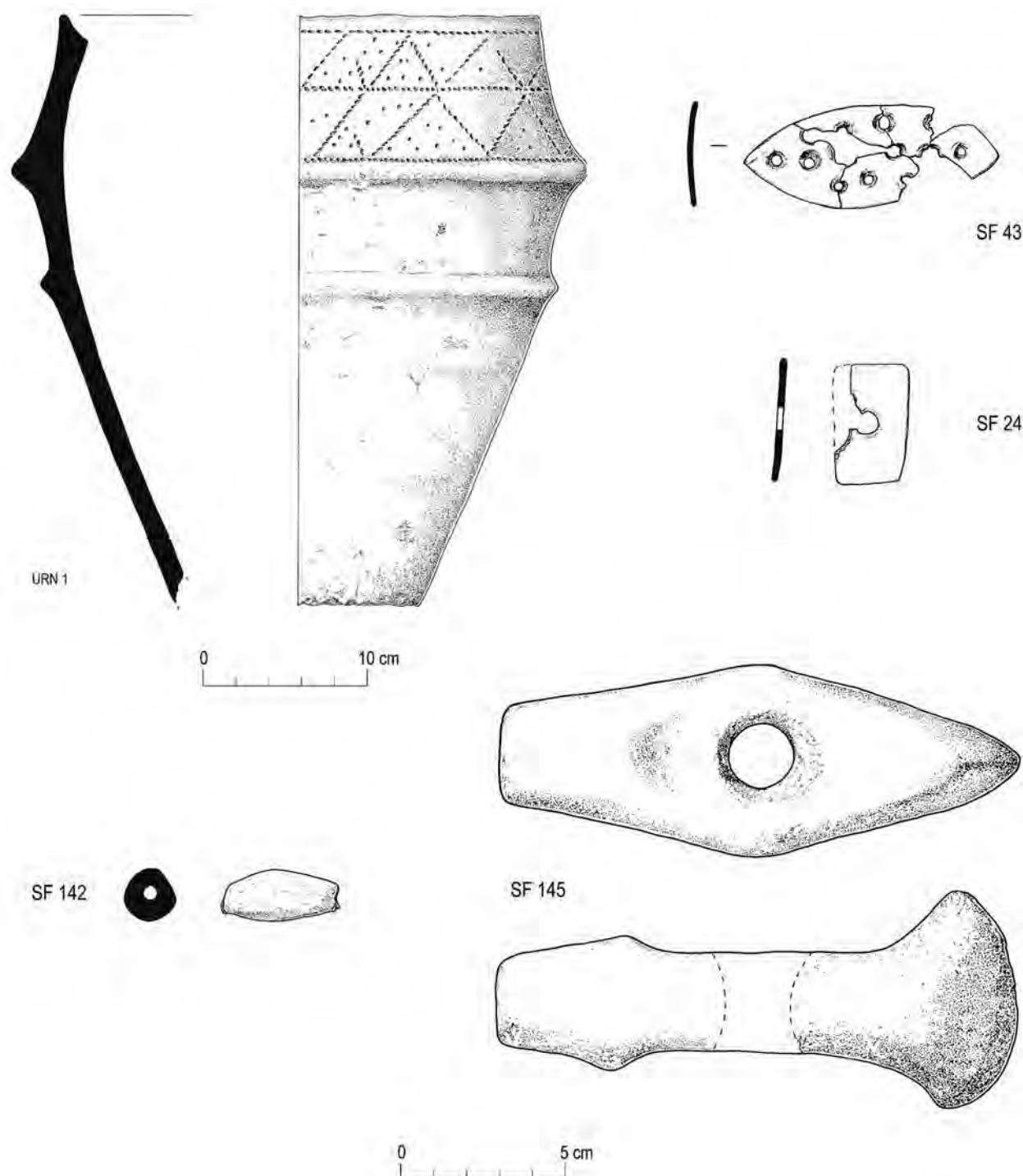
Around the start of the first millennium A.D., we see the abandonment of settlements like Eweford Cottages and

Phantassie as people congregated in large hilltop settlements like Traprain Law, a place which had been an important ritual focus for thousands of years. Pressure to coalesce socially and politically may have come from increasing awareness of an even larger entity, the Roman army, which was gradually making its way north.

Writing archaeological narratives

Large-scale excavations offer great potential for understanding the human past, and certainly the data from them should be made widely available – but how,

Fig. 2.7: Bone beads and toggles, a battle axe-head and a pottery urn from Eweford West.



and in what format? The approach we developed for the A1 excavations was tailored to the knowledge we recovered during the excavations and through post-excavation analysis, and it allowed us to develop a subtle, highly textured understanding of the long-term inhabitation of East Lothian's landscapes in prehistory. Certainly it is not the only approach that would have worked. What was fundamental to both the process and the product was the critical integration of concepts, data and models.

If all excavation, large-scale or small, is historical research, and the aim of it is always to construct archaeological narratives, then does this have implications for how we collect data in the field? Prevailing systems of field recording tend to encourage the fragmentation of archaeological remains as they are recorded – although they do not require it. We take apart the stratigraphy in order to understand it and we record its individual components in detail to ensure that a consistent and methodical record is made of physical characteristics and interpretations. What is often missing from the record, however, is the next step of re-integrating them into a coherently expressed understanding of what happened at a site. It may exist in the mind of the excavator, but its recording is not explicitly required and it is this higher level of inference that is often absent in published reports. More integrated recording systems that allow for on-site finds and environmental assessment, like those developed for the archaeological work at Heathrow Terminal 5 (Brown et al. 2006; <http://www.framearch.co.uk/t5>), can facilitate historical analysis in the field. However, this should already be taking place in the minds of the archaeologists as a matter of course.

Excavation reports that follow the traditional format of leading with description of the archaeology, following with interpretation and offering minimal integration of specialist analysis, are still overwhelmingly the norm. These publications often fail to deliver the narratives about human history that archaeology is so well equipped to provide. What is more, the process of writing such reports actively discourages authors from the kind of engagement with the evidence that is necessary to produce satisfying narratives. It encourages mechanistic rehearsal of the data and unimaginative

searches for morphological parallels. It fails to stimulate interesting research questions, because it provides a constricted forum for expressing the answers.

Our concern with constructing archaeological narratives for the A1 meant a responsibility to interpret the evidence as far as we could: in simple terms, to tell a story that was as truthful as we could make it. There is not one archaeological truth, but many possible ones; our approach was not the only one that would have done justice to the evidence. We wanted to give accounts that achieved the best fit we could find with the data. We sought to climb up the ladder of inference as far as it felt reasonable to go, while always making clear how we reached each rung.

The approach we chose presented its own challenges. Writing about formation processes in the active voice – in terms of people's actions in the past – was at odds with an abstract, impersonal writing style developed through long habit and training. It also at times produced accounts of acts that sounded mundane to the point of banality. That unintended result led us to wonder whether this is why archaeologists habitually write descriptively and in the passive voice – because it seems to exalt prosaic human actions to a more scientific, technical level, while writing more actively seems to oversimplify the archaeology and the formation processes that created it. In fact, many of the acts for which we found evidence along the A1 were probably quite straightforward in physical terms; the meanings behind them may not have been, however, and those are what we tried to reach.

We were very conscious of the importance of the project's public aspect. It was conducted in a semi-rural area, close to several towns and to the city of Edinburgh, and local interest was very strong. We gave several presentations locally and prepared a short popular publication that is available free of charge. The project appears to have generated enthusiasm both publicly and within government. Our national roads authority has been encouraged to understand that archaeology should not be regarded always as a negative experience, to be paid for and disposed of with as little fuss as possible. Well-handled preventive work can make direct connections between local communities and their past, which demonstrate, in a highly accessible and non-academic

Fig. 2.8: Reconstruction drawing of Eweford Cottages enclosed settlement.



way, exactly why such work is worthwhile and why it is reasonable to expect commercial developers and state authorities to fund it. Large-scale excavations in particu-

lar are often funded by public money; it is therefore even more important that the results be conveyed to the public in meaningful and accessible ways.

Fig. 2.9: Reconstruction drawing of Phantassie farmstead during phase 4.

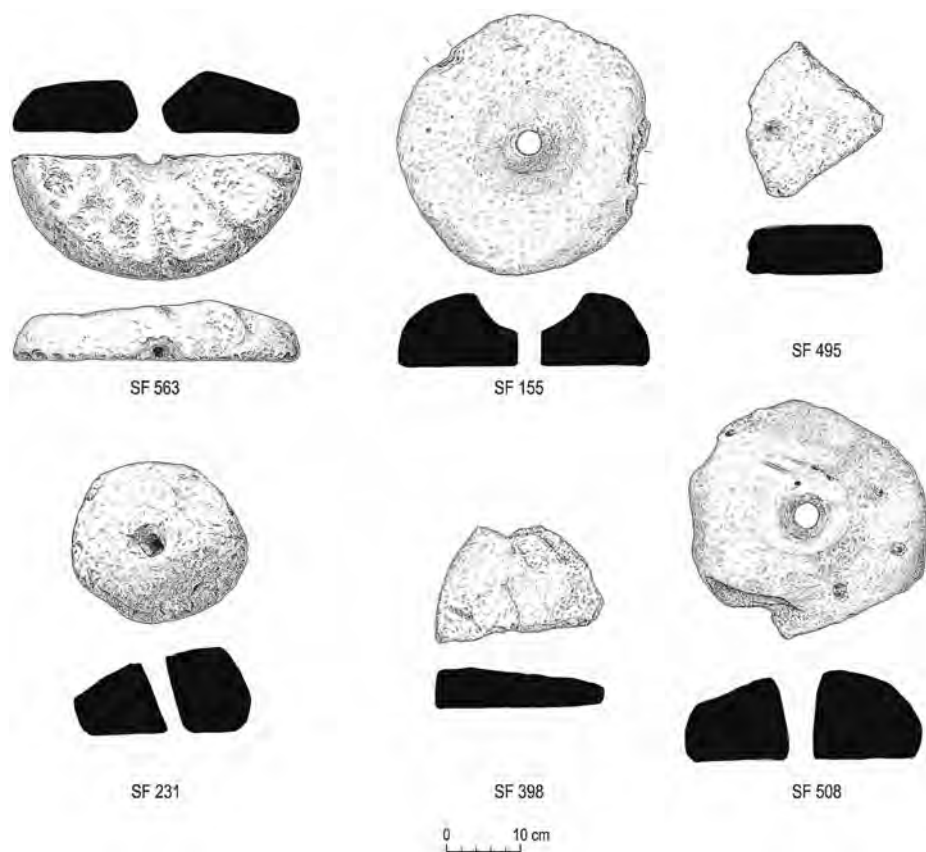
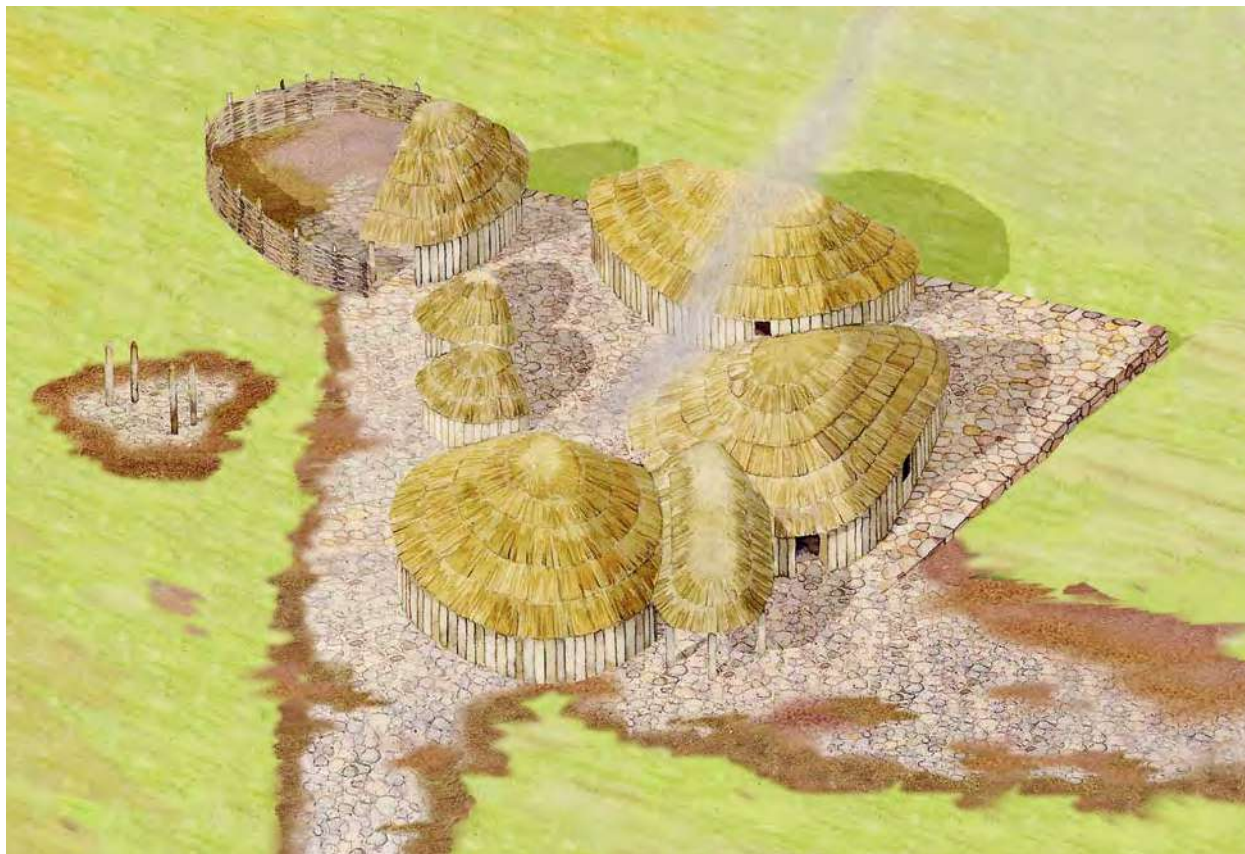


Fig. 2.10: Querns that were built into structures and surfaces at Phantassie.

Conclusion

There are many possible formats that could be pursued to interrogate data from fieldwork and disseminate the results effectively. Other recent initiatives, for example the INSTAR Programme in Ireland (The Heritage Council 2007), are expressing more ambitious views about what knowledge can be produced from the results of developer-led archaeology. Elsewhere, notably in Sweden, research and knowledge production are considered fundamental goals in contract archaeology (Lagerlöf 2008; Lekberg 2007; Swedish National Heritage Board 2007). The huge and complex sets of data that we produce on large-scale excavations merit the most interesting treatment we can give them. The creation of social knowledge through research – including excavation – should be the *raison d'être* of developer-led archaeology as well as other spheres of archaeological practice. There are other views, such as those that emphasise the economic benefits of archaeological knowledge for society. Underlying these distinctions are subtly different perspectives about the nature of archaeological

value (Carver 1996) and the complex inter-relationships between archaeological remains, the historic environment and cultural heritage. In this evolving context, the outcomes of any large-scale excavation should balance the different but mutually connected needs of all those with an interest at stake: the general interested public, academic researchers, developers and so on. Archaeologists, curators and developers can work together to create strategies for fieldwork, publication and dissemination which embrace knowledge production and engagement with audiences to maximise the benefits to culture, society and economy.

For us as archaeologists, the most immediate challenge is that we move beyond the limits of our own concepts and protocols – beyond the notions of site, and preservation by record, and data for its own sake. We can carry the interest and engagement we have with the archaeology beyond excavation, all the way through the content and form of its publication and other kinds of dissemination.

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Plans of the Iron Age cists relative to the Neolithic mortuary enclosures at Pencaig Hill (above) and Eweford West (below).

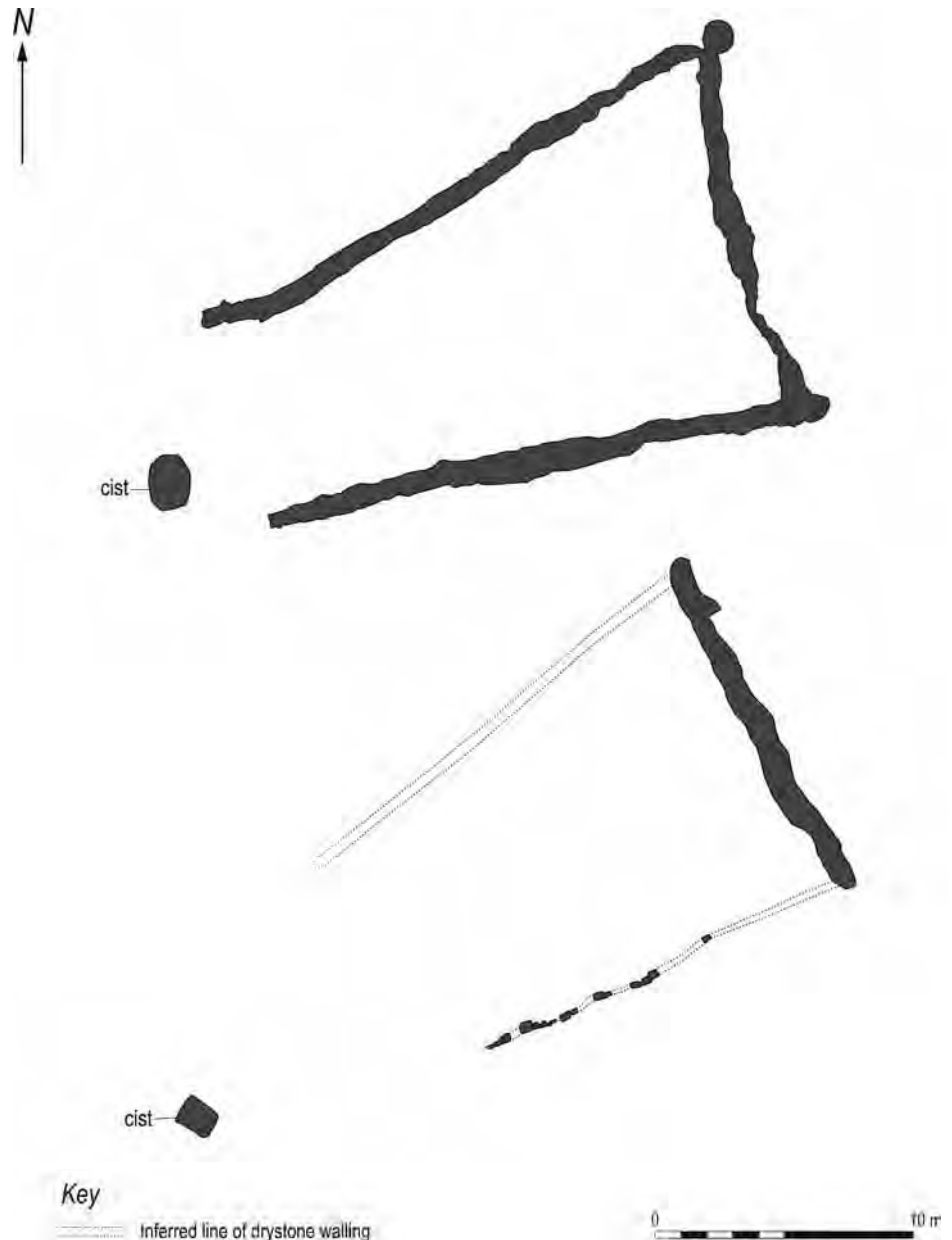


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Fig. 1–11: We are grateful to the Society of Antiquaries of Scotland for permission to reproduce. – Fig. 3–6, 8, 9: Drawings by David Hogg.

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3 | Routes to the past: large-scale roads excavations in the Republic of Ireland

Eamon Cody

Abstract: A major programme of road construction in Ireland, starting about the mid-1990s, led to a series of large-scale excavations along new road routes in all areas of the state. This paper outlines the background to these excavations, the measures put in place to deal with what was an unprecedented level of excavation, and introduces the reader to the sources of information about the results of the excavations. In addition, the range and variety of sites excavated are commented on while heritage management issues arising are briefly introduced. The greater part of the paper is devoted to presenting some details of the emerging evidence for the different periods of Ireland's past, showing how the roads excavations have enhanced the archaeological record.

Introduction

In Ireland, for just over a decade from the mid-1990s, a major expansion in development activity, both public and private, gave rise to a greatly intensified level of archaeological excavation. During this period, house construction surged to the highest per capita rate in Europe and, at the same time, a major road and motorway construction programme was undertaken, funded by public money. The roads projects entail building new or extending existing road networks throughout much of the country, with a focus on establishing motorway systems between the main provincial centres and the capital, Dublin and, in addition, on improving regional roads and on constructing by-passes around provincial towns. When plans were put in place for an extensive road-building programme it became necessary, in line with the terms of the Valletta Convention and Environmental Impact Assessment provisions, to respond to the archaeological implications of this activity. Archaeological mitigation measures were then put in place to deal with the impact of the road construction works. The outcome has been that, since about 1995, the national roads building programme has resulted in the investigation of hundreds of kilometres of new road routes. These large-scale linear projects have entailed the excavation of many hundreds of sites throughout the state. Two linear gas pipeline projects, undertaken in the 1980s, had given some indication of the archaeological potential of large-scale construction works (Cleary et al. 1987; Gowen 1988). However, the archaeological work generated by the recent development boom has proved to be vastly greater in scale and intensity than ever carried out in Ireland before.

Conduct of the roads excavations

The massive increase in archaeological investigations in connection with the roads construction programme occurred, as already mentioned, in tandem with an unprecedented boom in general construction activity,

house building in particular, all of which added to the level of archaeological work being undertaken. One measure of the increased archaeological activity was a steep rise in the number of licenses issued for archaeological excavations. For instance, while 490 were issued in 1997 the figure had risen to 1,721 in 2004. The greatly intensified level of archaeological activity had implications across all areas of archaeology. One very obvious result was the rapid growth in the numbers of archaeologists employed to deal with the greatly increased levels of archaeological work. The accelerated rate of activity also had implications for the management and control of the work. This was especially the case in relation to archaeological work connected to road construction. Initially, in the 1990s, there was little or no advance archaeological testing of new road routes but this system changed in 2001 (O'Rourke 2005, 1–2). In the 1990s, known sites were avoided and archaeologists monitored soil stripping on the proposed new routes. When sites were located, they were cordoned off and excavated as construction work continued. This mode of rescue excavation was found to be unsatisfactory. The increased pace and scale of archaeological activity was such that new mechanisms had to be put in place to deal with it. In 2001, the National Roads Authority (the public body responsible for motorway construction) hired a team of archaeologists to project-manage archaeological excavation which was carried out by private sector archaeological companies, while licensing of the archaeological work was handled by the National Monuments Service (NMS), the state archaeological service. A Code of Practice clarified the roles of the NMS, the National Roads Authority project archaeologists, and the private sector companies. It now became standard practice to carry out some level of archaeological assessment during the Environmental Impact Statement phase of a road scheme. Proposed routes were assessed as to their archaeological potential. Known sites were identified from the *Record of Monuments and Places* (the state inventory of archaeological sites) and the

artefact records of the National Museum of Ireland. Subsequently, when planning approval was in place, the entire route was searched for archaeological sites by centre-line testing with offsets. As known sites, i.e., those listed in the *Record of Monuments and Places* were, save in exceptional circumstances, avoided at route planning stage, the advance testing programme, supplemented by examination of aerial photography and geophysical survey, was a search for hitherto buried and unknown archaeology. All sites identified during advance testing were subsequently excavated before the road construction operations began.

Publicising the results

The large-scale roads projects are subject to standard reporting requirements. A condition of the excavation permit is that summary accounts of the results are published in the annual *Excavations Bulletin*, the content of which is also available via the internet at www.excavations.ie. Excavators are also required to provide a full stratigraphic report on the results to the NMS. These reports are accessible to the public. In addition, the National Roads Authority is disseminating the results in a variety of formats. Information is made available via presentations at public seminars, which are subsequently published in *Archaeology and the National Roads Authority Monograph Series*. Brief but informative accounts of excavations are also available in an accessible format in a magazine, *Seanda*. Detailed results are provided in a separate monograph series, the *National Roads Authority Schemes Monographs*. These monographs provide a commentary on the results of the excavations carried out on individual road projects or specified sections of larger schemes. Each monograph contains a compact disc on which can be found the final reports of the individual excavations referred to in the published volume. Another source of information about the work undertaken on the roads projects is the National Roads Authority archaeological database, accessible at www.nra.ie.

Archaeology revealed

The roads construction programme of the 1990s and 2000s was an opportunity to gain an insight into the extent of sub-surface archaeological remains in Ireland. As already noted, every effort was made to avoid known archaeological sites when planning the new road routes with the result that almost all of the archaeology investigated is new to the archaeological record. An indication of the scale of buried archaeology can be illustrated by some examples. In the year 2000, as a result of pre-construction testing and topsoil stripping of 33 ha of land for road realignment in County Wexford, in south-east Ireland, fourteen archaeological sites were found. On average, this represents one previously unknown site for every 2.4 ha of land (Eogan 2003, 44). In County Meath in eastern Ireland, some 167 sites of varying size and ranging in date from the Mesolithic period to the post-medieval period were excavated along 60 km of road-take, covering an area some 700 ha in extent (Deevy 2008, 71; 74). In County Laois in central Ireland, 94 archaeological sites of all

periods were revealed along some 41 km of road-take (Desmond 2006, 28). Cumulatively, as a result of the roads-building programme many hundreds of sites of all periods have been discovered around the country. The addition to the archaeological record of so many hitherto unknown sites is especially interesting in a country where there is such a high level of visible archaeological remains. This visible archaeology has understandably been the focus of study for Irish archaeologists, but what the excavations carried out in advance of road building have highlighted is the importance of factoring in the buried archaeology to the account of Ireland's past. One reason for this is that while the types of sites discovered vary considerably, large-scale excavation has been successful in revealing large numbers of sites, such as field-systems, house sites, pits, kilns etc. that by their nature did not have a marked above-ground expression. In addition, the excavations have brought to light many unexpectedly large sites that had been eroded over the centuries as a result of agricultural activities.

Roads-related archaeological excavations extended to all of the state's 26 counties, thus ensuring a widespread sampling of buried archaeological potential. It will thus be possible, when all the results are collated, to compare the rates of site discovery in different areas, which should give a useful picture of the potential extent of archaeological remains lying beneath the ground throughout the state. It should also be possible, in time, to identify land-types and land-forms and landscape types that tend to be more or less likely to reveal archaeology. However, it should be noted that the search for archaeological sites on new road routes does not qualify as a random sampling of the ground of Ireland as the routes were chosen so as to avoid known archaeological sites, special areas of nature conservation, and also residential areas, upland areas, and wet and low-lying ground (O'Rourke 2005, 7). Nevertheless, the result was a search for 'new' and sub-surface archaeological sites along numerous corridors opened across the landscape and across a variety of land-forms.

We may note that a comparable opening of the ground of Ireland took place during the construction of the rail network during the nineteenth century; however no provision was then made for the gathering of archaeological information. Nevertheless details of some finds were recorded in the archaeological literature at that time. The systematic approach to searching for and excavating archaeological remains on the routes of the new roads has resulted in the addition of vast quantities of new data to the Irish archaeological record. Preliminary statistics on the nature of the material uncovered is available. A breakdown of the some 500 sites that had been entered on the National Roads Authority archaeological database by 2008 showed that Bronze Age sites, at 33 %, were the most frequently encountered on roads projects (McCarthy 2008, 13). In all, 21 % of sites could not be assigned to any period due to a lack of datable evidence. The most frequently occurring site type was isolated remains, at 31 %, such as pits and hearths scattered along the routes. The next most frequent site type was burnt mounds and burnt spreads at 28 %.

As noted, every site encountered on the new road routes was excavated leading not only to the excavation of large numbers of sites but also ensuring the excavation of a wide range of site types. The excavation of

an increased range of site types has proved especially valuable as research-based excavation in Ireland, which began in the 1930s, has focussed mainly on the standard monument types typical of the Irish countryside, some examples being crannogs, ringforts, megalithic tombs.

Heritage management issues

The discovery of very many new archaeological sites within a relatively short time-frame, as has happened in Ireland, and their removal as a result of excavation soon after, poses issues for the management of the archaeological record. The *Record of Monuments and Places* (RMP), the state inventory of monuments, is a record of extant monuments and of places where there is good reason, such as documentary evidence, to believe a monument exists. Such monuments and places are afforded a measure of protection in law. Adding newly-discovered sites to the RMP is a relatively slow process, hidebound as the procedure is by quasi-legal requirements. The result is that many sites newly discovered on large infrastructural projects were not added to the RMP in advance of their removal through excavation. Once a monument has been removed in its entirety there is nothing to protect. As an aside, we might wish to ponder if the original space occupied by the destroyed monument is perhaps to be understood as some sort of cultural entity. Whether it is or not, it cannot, under current law in Ireland, be afforded protection. It is though important to maintain a record of archaeological sites that have been removed, as these are a vital part of the country's archaeological story. The NMS is examining mechanisms to record the locations of such sites within the RMP. Of course, some sites are not fully removed through excavation on roads schemes as they fall only partly within the road-take. Such sites still require protection and qualify for inclusion in the RMP.

Adding results of excavations to an inventory does pose other problems. When the site in question is a recognisable monument type, adding it to the record is a straight-forward matter. However, when the features uncovered are burnt spreads of various types or pits in varying degrees of proximity, often with no dating evidence, it can be difficult to determine if one or more sites are represented.

An enhanced archaeological record

The extensive excavations linked to road construction have greatly enhanced the Irish archaeological record for all periods. Even at this preliminary stage, some appreciation of the implications of the new data for the

different periods of Ireland's past can be gained from the available published material arising from the roads excavations. To do this, examples of the emerging evidence for different periods will be referred to below, briefly for some periods and more fully for others.

Starting at the beginning, as we know it, of the story of the settlement of Ireland we note that, despite the extensive archaeological activity of the 1990s and 2000s, there is as yet no convincing evidence that there was a human presence in Ireland during the Palaeolithic. It seems it was not until about 10,000 years ago, say 8,000 B.C., that Ireland experienced a human foot-fall. This date marks the start of the Mesolithic period that lasted until about 4,000 B.C. The people of the Mesolithic lived by hunting and collecting food but in a forested landscape with modern forms of animals and plant life. In Ireland, there was a comparatively restricted range of animals and plants available, thus placing considerable reliance on fish as a food source, supplemented by small animals such as wild pig and hare and by fruit and hazelnuts. The surviving traces of the peoples of the Irish Mesolithic period are the extensive range of stone implements that survive and, in addition, a small number of settlement sites thought to have been occupied on a seasonal basis. In the absence of excavation, recognition of Mesolithic sites in Ireland is largely dependant on the surface occurrence and identification of characteristic lithic artifacts. Undoubtedly, the lithic assemblages of the period were matched by a comparable array of artifacts in a variety of organic materials that have perished. Large-scale excavation has served to improve the chances of encountering a range of Mesolithic material and site-types that have the potential to paint a much fuller picture of the complexity and richness of hunter-gatherer lifestyle than can be gained from the more readily recognised sites of the period. A discovery in a section of raised bog on a road scheme at Clowanstown, County Meath, in east central Ireland, can be cited as an example of just such a Mesolithic site (O'Connor 2008, 84–6). Here, a Late Mesolithic camp was shown to have stood alongside a shallow lake. There was evidence at the site for food processing in the form of hazelnut and acorn shells, animal bone and, in addition, stone tools and chipped stone débitage indicating tool production there. More intriguingly, on the old lake-bed four conical baskets and fragments of others were found (fig. 3.1). Made of twined twigs of different wood species, the baskets have been dated to the centuries around 5,000 B.C., towards the end of the Mesolithic period. The baskets, skilfully made, are considered to have been employed to harvest fish, either by simply scooping the catch out of the water or they may have been placed in the water and used as traps.

Fig. 3.1: One of a number of conical, woven basketry fish-traps dating from the Late Mesolithic period that were excavated at Clowanstown, County Meath, on the route of the M3 Clonee to North of Kells motorway scheme (Photo: John Sunderland).



In Ireland, the Mesolithic era came to an end in or about 4,000 B.C. The succeeding Neolithic period saw the development of a new way of life based on farming, both stock-raising and crop growing. Other innovations of the period were new types of lithic artifacts, the first appearance of pottery-making and a new monument type, the megalithic tomb, and it is these elements that have traditionally dominated Neolithic studies in Ireland. New data coming to light is broadening out the picture of this period. As an example, attention can be drawn to the considerable number of rectangular wooden house-type structures of Neolithic date now known. Before the recent intensification of archaeological investigation there was increasing evidence for the presence in Neolithic Ireland of such structures. This has been confirmed by the roads excavations which have resulted in the discovery of many more examples. The important contribution of the roads excavations in regard to these structures has been to show that they occur in all parts of Ireland. These structures, usually oak-built, vary in size from just over 20 m² to over 100 m². The finds associated with them generally consist of early Neolithic round-bottomed carinated pottery, standard lithics of the period and, frequently, cereal grains. On available evidence, they date to the early Neolithic, the period 4,000–3,600 B.C. in calendar years (McSparrow 2008). Their often substantial nature is such as to lead to some uncertainty as to their function. Were they dwelling places of family units (Grogan 1996, 54) or sites of communal assembly as suggested by Cross (2003), who argues that they may have been venues for feasting events. Substantial quantities of cereal grains have been recovered during excavation of some of these

structures, as has animal bone, usually cattle. It is not, of course, possible to say if remains of food-stuffs at such a site represent the food supply of a family or the remains of feasting events. As to the question of function, it could be that some of these structures, perhaps the smaller ones, served as standard family dwelling places and that bigger units played a more communal role as places where a range of socio-ritual activities, perhaps including feasting, may have taken place on occasions. Whatever the true role of these structures, it does seem that the similarity of the type across Ireland is evidence for some form of settlement uniformity at that time. Staying with the Neolithic rectangular structures, an interesting aspect of the roads excavations results is the discovery not only of single examples but of groups of two or three such structures in close proximity. For example, three were found close together at Monanny, County Monaghan (fig. 3.2) in north-central Ireland (Walsh 2006). These were oak-built, dating to c. 4,000 B.C., at which, like at their counterparts elsewhere, were found large quantities of plain early Neolithic pottery, some lithics and also cereal remains.

The evidence from roads excavations that house-type structures are of widespread occurrence in early Neolithic Ireland, with examples known from all four provinces, does pose interesting questions. One notable one is the issue of their relationship with megalithic tombs. In the early Neolithic, while the house-type sites now seem to be represented in all parts of Ireland, the more numerous megalithic tombs have a more restricted distribution, being for the most part confined to the northern half of the country. The earliest megalithic tombs are thought to date to about the same period as

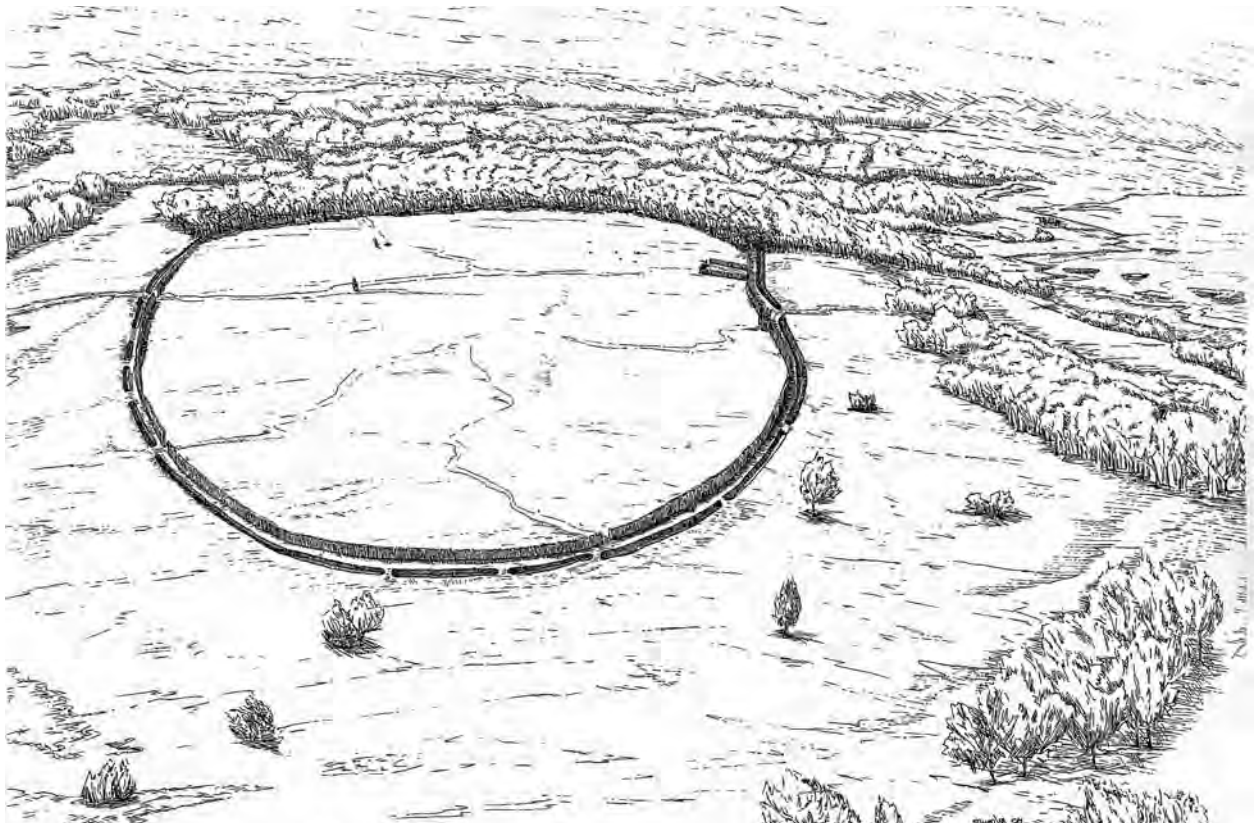
Fig. 3.2: Aerial view of three Neolithic houses excavated at Monanny, County Monaghan, on the route of the N2 Carrickmacross Bypass (Photo: Studio Lab).



the house-like structures, i.e., c. 4,000–3,600 B.C., and there is at least one confirmed incidence of the construction of a megalithic tomb on the site of a recently-abandoned house (Ó Nualláin 1972, 7–9), a sequence of activity perhaps to be interpreted as the conversion of a hitherto domestic or secular space to ritual use. Alternatively, it can also be suggested that if, as discussed above, the so-called houses served a wider socio-ritual role, then the construction of a tomb at the site of an abandoned house may suggest some sort of ideological change in communal expression, made manifest in the move from the use of wood for the construction of house-type structures to the employment of large stones to build megalithic tombs. It may have been that, in the northern half of Ireland, activity switched from communal gatherings at large house-type structures to gatherings at megalithic tombs, all perhaps indicative of an increased role for the dead in the socio-ritual sphere. Roads excavations have revealed sites that while not readily understood, do open up new vistas on aspects of life in the past. One of many such sites is at Clowans-town, County Meath, where Mesolithic baskets, already referred to, were found, and which was to be the site some centuries later of activity in the early Neolithic (O'Connor 2008, 87). At this stage, the lake where the Mesolithic baskets were found had been in-filled by raised bog and the surrounding area enveloped by peat. Here, over a natural hollow, a large mound consisting of at least seven interspersed layers of burnt material and re-deposited lake marl, had been constructed. Seven sub-rectangular troughs lay around the mound, which the excavator suggests may be related to each of the burnt deposits. Four similar mounds of

burnt and unburnt stone were recorded in the vicinity. All the mounds were subsequently sealed with a layer of unburnt stones, thus consolidating them into one monument. A wooden container was deposited in the centre of the main mound and has been dated to about 3,700 B.C. Deposits consisting of cremated animal bone mixed with marl occurred in the mounds. These were clearly deliberate deposits as some were wrapped in bark. Other finds were early Neolithic carinated pottery and burnt flint as well as polished flint pendants, polished bone pins and polished stone axeheads. The excavator remarks of the Clowans-town site that the evidence suggests a long formation process, with the high-status objects incorporated into the sealing of the mounds perhaps representing ritual deposits marking the abandonment of the site. At this preliminary stage this site defies easy explanation. The evidence may point to episodic gatherings where rituals involving the use of fires were important, but what the underlying purpose was remains a matter for speculation. Individual sites located on roads projects are of interest in themselves, but equally they each form part of a wider landscape. Revelation of hitherto unknown sites by excavation represents additions to our picture of ancient landscapes. Interesting new evidence arose from excavations along a four-kilometre stretch of road-take near Sligo town in north-west Ireland (Danaher 2007). Here some thirty monuments, all but one prehistoric in date and mainly of the Neolithic and the Bronze Age, came to light. Especially interesting on account of its extreme rarity in Ireland was the discovery of a causewayed enclosure at Magheraboy, County Sligo (fig. 3.3). Only the second example of the type so far

Fig. 3.3: Reconstruction of a Neolithic causewayed enclosure excavated at Magheraboy, County Sligo, on the route of the N2 Sligo Inner Relief Road (Drawing: John Murphy for Archaeological Consultancy Services Ltd.).



identified in Ireland, dating of the monument shows ditch construction took place between 4,100 and 3,950 B.C. and with activity lasting at the site until 3,600 B.C. At a local level, the causewayed enclosure is notable for its occurrence just 2 km east of the Carrowmore-Knocknarea megalithic tomb complex, the largest complex of passage tombs in Ireland. This group of tombs, some thirty now and originally perhaps twice that number located on rolling land at Carrowmore, and some ten others 2 km to the north-west on Knocknarea Mountain, are located on the small peninsula of Cúil Irra. The causewayed enclosure, also on the peninsula, adds to the richness of the archaeological record from the Neolithic in this area. Uncertainty as to the date of these passage tombs, which were certainly in existence by the mid-fourth millennium B.C., means that the chronological relationship of the causewayed enclosure to the tomb complex is uncertain. We can though presume, whether they were in use at the same time or one preceded the other, that jointly they served as foci of communal activity where people would have gathered at significant occasions to enact socio-cultural rites as part of the annual cycle of activity. Interestingly, a curious comparison suggests itself between the layout of the core area of the passage tomb cemetery at Carrowmore and of a causewayed enclosure. Bergh (1995, 119) has described how at Carrowmore the passage tombs are arranged in a rough oval around a central area largely free of tombs. The tombs can be characterised as acting to segment the oval perimeter in a fashion analogous to the segmented perimeter of a causewayed enclosure. It is to be wondered, however, if this comparison had any validity for the builders of the monuments in question. On a wider scale, the pre-4,000 B.C. date for initial construction of the causewayed enclosure is of interest in the context of any discussion of the introduction of the Neolithic to Britain and Ireland. There can be no doubt that the origin of the British and Irish Neolithic lies in continental Europe, which was the immediate source of the domesticated plants and animals of the first farmers in the two areas. When the date for the County Sligo causewayed enclosure is added to the other early date for Neolithic influence in western Ire-

land, that of 4,300 B.C. for domesticated cattle remains from a site on the coast of County Kerry in south-west Ireland (Woodman et al. 1999), it does raise the possibility that the waters of the Atlantic and North Sea are as likely to have conveyed influences from different areas of continental Europe just as easily, and possibly as soon as or even earlier, to western Ireland as to the coasts of Britain.

Staying with the Neolithic, a site showing evidence of curious patterns of animal slaughter, dating to the Middle Neolithic, was discovered at Kilshane, County Dublin, in eastern Ireland (FitzGerald 2006, 33–35). This was a ditched enclosure, oval in outline and measuring 37 m by 27 m in extent (fig. 3.4). The enclosing ditch was found to contain some 300 kg of cattle bone sealed by fills containing middle Neolithic pottery, dating to 3,200–2,800 B.C. This represents the largest assemblage of cattle bone to date recovered from prehistoric contexts in Ireland. In all, the ditch contained the remains of 40 to 50 eighteen-month-old cattle. As some of the remains were articulated and lacked butchery marks it would seem that they did not represent the remains of a feasting event. What seems to have occurred is that the animals were slaughtered and placed in the ditch intact. Quite why this was done is a matter for speculation. One explanation would seem to be that the remains represent deliberate animal sacrifice.

Looking at the Bronze Age and Iron Age, what is of considerable interest is the light being shed by the roads excavations on aspects of habitation and daily life. Hitherto, the largest body of evidence for the early Bronze Age (c. 2,400 B.C.–1,400 B.C.) derives from two sources, a rich funerary tradition represented by a variety of burial monuments associated with a range of funerary pottery styles, and also a rich metalworking tradition in bronze and gold, sometimes found in burial monuments but more usually as stray finds or hoards, while the later Bronze Age is known largely from hoards of metalwork. The extensive excavations undertaken in connection with road construction have increasingly revealed evidence of houses and habitation. To refer to just one example, excavation at Ballybrowney, County Cork (Cotter 2005, 37–43), in the south of Ireland, revealed evidence of a village settlement represented



Fig. 3.4: Elevated view of a Neolithic henge enclosure excavated at Kilshane, County Dublin, on the route of the N2 Finglas-Ashbourne road scheme (Photo: Hawkeye).

by three houses and three enclosures dating to about 1,600 B.C. (fig. 3.5). The presence of quern fragments, indicating crop production, and the evidence of copper smelting, together point to a self-sufficient community. As to the Iron Age (c. 500 B.C.–A.D. 500), a period that has been referred to as ‘the most obscure’ in Irish prehistory with domestic habitation sites ‘virtually unknown’ (Waddell 1998, 279; 319), roads excavations have revealed a great many sites that are serving to rescue the period from obscurity. In the southern province of Munster, an area where there was little evidence of Iron Age activity, recent roads excavations have revealed 30 new Iron Age sites in counties Cork, Limerick and Tipperary, relating to a wide range of activities, settlement, industrial, burial and ritual (McLaughlin & Conran 2008, 51–53). The evidence, though limited, is interpreted by the authors as indicating continuance of aspects of settlement practice such as the use of roundhouses, and burial practice such as the cremation of the dead, already in place in the Bronze Age. Excavations on road routes further north have also thrown some light on aspects of Iron Age life. Activities of Iron Age date re-

vealed at sites close to the town of Dundalk, County Louth in north-east Ireland (Roycroft 2006, 9) included pits, some showing signs of metalworking, dated to 410–200 B.C. At the same site, overlooking the confluence of two rivers, a cooking pit was associated with some structural post-holes, perhaps the remains of a temporary shelter, all with dates in the fifth to fourth century B.C. Another site in the same vicinity was a well-preserved corn-drying kiln dating to A.D. 60–250, a pointer to an aspect of the Iron Age economy. Excavation along road corridors has resulted in the discovery of sites relating to all eras of Ireland’s past. For instance, the 94 sites excavated along some 41 km of road-take in County Laois, referred to above, included sites representing almost all periods of human activity. Yet some routes have revealed predominantly prehistoric sites, as for instance the Magheraboy complex in County Sligo, also referred to above. Another road corridor, although situated only some 10 km south of the great passage tomb complex at Brú na Bóinne, home to the mega-passages tombs of Newgrange, Knowth and Dowth, revealed a largely medieval landscape along

Fig. 3.5: Aerial view of a Bronze Age village excavated at Ballybrowney Lower, County Cork, on the route of the M8 Rathcormac/Fermoy Bypass (Photo: Archaeological Consultancy Services Ltd.).



some 35 kilometres of road-take through parts of counties Kildare, Meath and Westmeath, in east central Ireland. Some 30 archaeological sites were excavated along this route. This had been a wet area in prehistoric times and thus of limited interest for settlement. However, as a result of drainage, improved agricultural technology and iron-working, it proved much more attractive for settlement in the early medieval period (Carlin et al. 2008, 5). The bogs and forests that may have discouraged settlement in the prehistoric period provided iron ore and fuel that made it attractive to early medieval and medieval folk. A feature of about half the sites excavated along this road route was the abundant evidence for iron-working and production (Carlin et al. 2008, 87–112). Some of this evidence related to the prehistoric period, the late Bronze Age and the Iron Age, but the bulk of the evidence was of early medieval and medieval date. Hitherto, understanding of iron metallurgy in Ireland was poor but the results of analysis arising from this road project have been of particular importance and provide an insight into the character and nature of iron metallurgy in Ireland from the late prehistoric period to the medieval period. In regard to the early medieval period, the indications are that small-scale iron-working was routinely carried out on farmsteads. It seems that proficiency in iron-working, and also textile production, was normal for the early medieval farmer. A more rounded picture of early medieval lifestyle is demonstrated in the results of the excavation of two of the major sites along the road route. The first of these sites, at Killickaweeny, County Kildare, is an example of the classic habitation enclosure

sure of Ireland's early medieval rural landscape (Carlin et al. 2008, 27–53). Ringforts, as such sites are known, are embanked or stone enclosures that served as the farmsteads of free-men in early medieval Ireland. Such sites have been the subject of informative excavations in the past. However, the total or near total excavation of examples uncovered on road routes, using modern excavation methods, are furthering our understanding of this monument type. Excavation at Killickaweeny has provided an insight into daily life on such a site. Initial settlement there was represented by traces of a ditched enclosure which was subsequently enlarged to create an enclosure sub-oval in plan, and measuring 60 m by 80 m in extent (fig. 3.6). Of interest was the organisation of space within the enclosure, divided as it was into a habitation area at the southern end which was separated from a large open area apparently devoted to housing animals, particularly cattle. Metal-working was an important activity and was carried out at two locations on the site with smelting, smithing and forging all represented there. Artifacts found at the site included metal pins, knives and nails, some glass beads, bone combs, bone pins and needles, a spindle-whorl made of antler suggesting textile production on site, and the remains of some small wooden vessels. The range of artifacts testifies to the domestic character of the site. While radiocarbon dates indicate activity at this site from the eighth to tenth centuries A.D., the excavators note that there was no evidence for re-building of houses and suggest that it may have been inhabited only for one or two generations. It would seem that this site was the home of a self-



Fig. 3.6: Post-excavation plan of an early medieval settlement enclosure excavated at Killickaweeny 1, County Kildare, on the route of the M4 Kinnegad-Enfield-Kilcock motorway scheme (from Carlin et al. 2008, 28).

sufficient and relatively wealthy family, its main source of wealth derived from stock raising. As the ringfort at Killickaweeny is but one of a number of such sites dispersed across the local landscape (Carlin et al. 2008, 5), the early medieval settlement picture that emerges is of a community of relatively economically independent social units.

The other large site excavated on the road route was at Johnstown in County Meath (Carlin et al. 2008, 55–85). This is an example of an early medieval enclosure type that has recently come to prominence largely as a result of the excavation of a number of examples on road corridors. Now known as cemetery-settlement sites, these are usually multi-phase monuments where domestic habitation and burial both occur. The relatively short period of occupation at Killickaweeny is in marked contrast to the situation which obtained at the cemetery-settlement site at Johnstown, located just 5 km to the west. Johnstown had its origins in the fourth or fifth centuries A.D. as a small late Iron Age burial mound. Sometime between the fifth and seventh centuries, an enclosure was constructed around the mound. The site thereafter, down to the fifteenth and possibly the seventeenth century, was to serve as a place of burial and domestic habitation. The original enclosure was replaced by another within a short time-frame, and sometime in the ninth or tenth centuries a third and larger phase of enclosure took place. In its final form the enclosed area measured almost 60 m in maximum dimension. The burials were largely confined to the eastern half of the enclosure and the remainder of the site served as a place of domestic habitation, showing a similar range of activities as at Killickaweeny, stock-keeping, cereal-growing and metal-working. The picture of domestic life at Johnstown is of self-sufficient and relatively wealthy farm families in successive occupation over centuries. But while Killickaweeny is a purely domestic site, that at Johnstown, strangely to modern eyes, served both a domestic and funerary function. This combination of a domestic and funerary function is of considerable interest, especially in the context of the widespread adoption of the Christian faith in Ireland. Christianity was introduced to Ireland in or about the fifth century A.D. In the ecclesiastical sphere, churches with attendant living quarters for clerics and a burial ground, were sited within round enclosures built of earth and/or stone. From the eighth century, when the church is considered to have become firmly established, it actively campaigned for all Christians to be buried at ecclesiastical centres and for the abandonment of secular burial sites such as Johnstown. That Johnstown and a growing number of similar cemetery-settlements are now known and are shown to have continued in use after the eighth century may demonstrate a continuing attachment to places and aspects of ritual practice that owe more to pagan beliefs than to those of the new Christian religion. Burials ceased at most such sites in the eleventh or twelfth century but, exceptionally, at Johnstown continued until the fifteenth to seventeenth century, a remarkable manifestation of attachment to place. Interestingly, the burial tradition at Johnstown was to extend into the modern era. Sometime around A.D. 1700, a *cillín* burial ground was established just south of the enclosure and remained in use until the early twentieth century. The Irish word *cillín* is applied to places where un-baptised children were buried, a practice that has its origin in church decrees that forbade the un-baptised

to be buried in consecrated ground. Taken together, the ringfort at Killickaweeny and the cemetery-settlement at Johnstown serve as examples of the variability and complexity of settlement sites in the early medieval period (Carlin et al. 2008, 132). They provide insights into the rural economy and lifestyle of the period and, in the case of Johnstown, hint at a continuing attachment to familiar places and ways in the ritual sphere on the part of at least some of the populace in the face of a successful new religion.

Traditionally, excavation in Ireland has tended to focus on prehistoric and medieval sites, but on the roads schemes sites of all periods, once encountered, are fully excavated. One result has been the excavation of early modern sites that have traditionally received little attention in Irish archaeology. Examples of such sites excavated during the roads programme are an early nineteenth-century vernacular cottage at Palmershill, County Laois (Kenny 2008, 49–50) and a nineteenth-century estate cottage at Moyode, County Galway (Janes & Murphy 2007, 32–33). Excavation of such sites has the capacity to enliven the rich documentary sources of the period, which will in some cases allow us to link some of the sites to named individuals, and not only to those of rank or high office.

Comment

The obvious result of a decade and more of large-scale excavation in Ireland has been the discovery and excavation of hundreds of archaeological sites, almost all hitherto unknown, thus demonstrating the richness of the sub-surface archaeological record. The scale of the new material is such as to force a re-evaluation of our understanding of Irish archaeology. It has been reported (Stanley 2007, 5) that at a launch of a National Roads Authority publication in 2007, the previously undocumented sites and hitherto unknown site types and artifacts being uncovered on roads excavations were characterised as ‘Rumsfeldian archaeology’, i.e. ‘the archaeology we didn’t know we didn’t know’. It will take some time for all the results to be made available and even longer to fully assimilate and come to terms with all the implications of the new data. However, even at this preliminary stage in evaluation of the results, it is clear that the new material will add very substantially to our knowledge and understanding of Irish archaeology. As noted, the new data has already served to broaden our picture of life in the past by re-balancing the archaeological record in favour of the less visible archaeological sites, the domestic sites and features that represented the greater part of people’s lives. Ongoing scientific analysis of finds and features is yielding much new information on a range of past technologies, as for instance in the case of iron metallurgy, brief mention of which has been made above. Another area of rich potential, also being exploited, lies in the analysis of skeletal material from large cemetery excavations, affording both an insight into earlier lifestyles and demographic patterns. A challenge for Irish archaeology is to fully exploit the data gathered on hundreds of excavations during just over a decade of large-scale roads excavations so as to advance our understanding and knowledge of all periods of our past.

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4 | Des sondages systématiques et des fouilles réalisées sur de grandes superficies.

Deux techniques au service d'un passé enseveli

Geertrui Blancquaert et Pascal Depaepe

Résumé : La loi française sur l'archéologie préventive, le diagnostic et ses méthodes d'intervention, ainsi que les fouilles sur de grandes superficies font l'objet de cet article. Chaque procédé, engagé dans la sauvegarde du patrimoine et l'enrichissement des connaissances, est présenté et illustré par des cas concrets. Une discussion porte sur une nécessaire interdépendance de sondages systématiques et de décapages exhaustifs.

Introduction

L'omission, volontaire ou non, du terme « préventif » dans le titre de la conférence « *Large-scale excavations in Europe : Fieldwork strategies and scientific outcome* » organisée par l'EAC, témoigne en faveur d'une recherche qui fait abstraction de ce que l'on pourrait appeler une archéologie à deux vitesses, programmée et préventive. S'il faut en effet parvenir à gommer l'opposition qui subsiste encore entre deux « archéologies » et à promouvoir leur complémentarité, il convient néanmoins de faire une mise au point sur leurs conceptions respectives. L'archéologie programmée définit ses objectifs de recherche en préalable aux investigations de terrain afin de combler des lacunes en fonction de ses problématiques propres. L'archéologie préventive en revanche est conditionnée par l'aménagement territorial. Et c'est elle qui favorise bien souvent la réalisation des fouilles à grande échelle. Aussi, l'objet de cet article est de mettre en lumière, à partir des travaux menés par l'institut national de recherches archéologiques préventives (INRAP)¹, l'engagement de fouiller dans une perspective double : préserver le patrimoine et enrichir, si ce n'est « renverser », les fondements scientifiques. Ainsi, deux des trois missions² capitales qui ont été confiées à l'établissement public qu'est l'INRAP par le législateur seront exposées car en phase avec le sujet du groupe de travail du EAC.

La loi française sur l'archéologie préventive prône une approche binaire : le diagnostic et la fouille. La finalité de la première comprend la détection et l'évaluation du potentiel archéologique d'un lieu menacé par la destruction. À défaut de décapages intégraux, la pratique, non exclusive, de sondages mécaniques en tranchées est cependant devenue la norme. L'objectif étant d'apporter la matière scientifique nécessaire à la décision, soit de conserver les vestiges *in situ*, soit d'en assurer la sauvegarde par l'étude au moyen d'une fouille alors dite « préventive » car ordonnée par les projets de développement territorial. Ceux-ci se caractérisent par des dommages irréversibles et imposent, pression politique oblige, un calendrier serré aux archéologues. La fouille, quant à elle, demeure la technique appropriée de la science qu'est l'archéologie et elle est à même de faire progresser véritablement nos connaissances des sociétés anciennes.

Dans le dispositif français s'agit-il d'en faire trop ... ?

Une des mesures de protection du patrimoine telle que préconisée par la convention de Malte art. 2, ii : « *la constitution de zones de réserve archéologiques, [...] pour la conservation de témoignages matériels à étudier par les générations futures* » ne peut être garantie dès lors que l'on évolue dans un contexte d'aménagement urbain et rural. La situation d'après-guerre et celle d'aujourd'hui ne cessent de prôner un développement territorial consommateur de surfaces à construire ; qu'il s'agisse de carrières d'extraction, d'infrastructures liées au transport ou de création de villes nouvelles. Ces projets sont soumis à une évaluation des incidences ou étude d'impact sur l'environnement ; ce maître mot où le patrimoine archéologique trouve heureusement sa place car considéré comme un des éléments le constituant (directive européenne n° 85/337/CEE). Le dispositif législatif français situe cependant l'intervention du diagnostic archéologique et les fouilles qui en découlent dans la phase ultérieure ; celle de l'action préventive. Autrement dit, dans les cas où le projet d'aménagement ne peut être modifié ou annulé, les vestiges archéologiques majoritairement non apparents sont par conséquent voués à la destruction. Il est alors indispensable de mettre en œuvre une politique (européenne) de détection et, le cas échéant, de fouille.

La France occupe une superficie de 552 000 km², soit 55 200 000 ha. Chaque année, près de 70 000 ha, soit 0,1 %, sont détruits par les travaux d'aménagement territorial. De ces surfaces menacées annuellement, 15 % sont soumis à un diagnostic, soit 0,03 % du territoire national et 0,5 % fait l'objet d'une fouille, soit 0,0006 % ! Au premier abord ridicule, ce chiffre englobe cependant de nombreuses fouilles sur de vastes espaces décapés, autant de fenêtres qui portent un regard « à cœur ouvert » sur des archives du sol. Quelques illustrations s'imposent.

Le diagnostic

Après étude du projet d'aménagement par les services de l'Etat, ceux-ci prescrivent un diagnostic : un arrêté de prescription délivré par le Préfet de région et notifié à l'aménageur. L'INRAP ou les services archéologiques de

collectivités territoriales agréées le réalisent. Le diagnostic, qui n'exclut aucunement une prospection pédestre, ni d'études documentaires⁴, comprend dans la majorité des cas une campagne de sondages mécaniques dont le ratio d'ouverture au sol est compris entre 5 et 10 %. À ces sondages superficiels sont combinés, en fonction du type d'aménagement, des sondages profonds destinés à découvrir des occupations du paléolithique. Mais au-delà du repérage indispensable et de la caractérisation des vestiges (chronologie, densité et étendue de l'occupation), l'enjeu essentiel réside en l'identification d'indices exploitables.

Méthodes d'intervention

Le repérage préalable

L'importance donnée aux recherches préalables⁵ et principalement non intrusives est proportionnelle à l'ampleur du projet et dépend de la programmation scientifique qui prend en considération l'état des connaissances du contexte environnemental et archéologique. Ce dernier est consigné dans un inventaire national, la carte archéologique. Au-delà, il est évident que les techniques de ces investigations préliminaires varient en fonction de l'objectif. Le repérage préalable, si besoin est, des sites paléolithiques ne s'effectue pas de la même manière que ceux du Moyen Âge. Le premier repose davantage sur une approche géomor-

phologique, le second sur une étude d'archives. On se contentera ici de présenter quelques exemples portant sur la préhistoire.

L'exemple de sites du Paléolithique ancien et moyen

Lors de la découverte d'industrie du paléolithique, il est primordial de déterminer leur caractère « en place » et leur position chronostratigraphique car ces informations sont essentielles à la décision sur la suite à donner aux sondages positifs : fouille du site ou non. Toutefois, avant de procéder à une campagne de sondages profonds, il s'avère indispensable d'effectuer un repérage préalable des secteurs propices à la conservation d'occupations paléolithiques. Cette étape porte pour l'essentiel sur l'examen de sources documentaires (cartes topographiques et géologiques, données géotechniques) et une prospection pédestre visant à repérer les formations géomorphologiques. Ce repérage doit être réalisé en amont de la phase de sondages et par une équipe expérimentée combinant géologues et archéologues.

L'exemple de l'Autoroute A 29-Est (Amiens à Saint-Quentin) illustre l'efficacité de telles pratiques. En effet, sur les neuf sondages positifs, sept se trouvent dans des zones considérées comme très sensibles par l'étude préalable (Fig. 4.1).

Sur l'opération LGV Mulhouse-Dijon, la prise en compte des repérages préalables a permis d'orienter les équipes en charge des sondages profonds sur des

Fig. 4.1 : Opération A 29, comparaisons entre indices géomorphologiques et sites découverts.

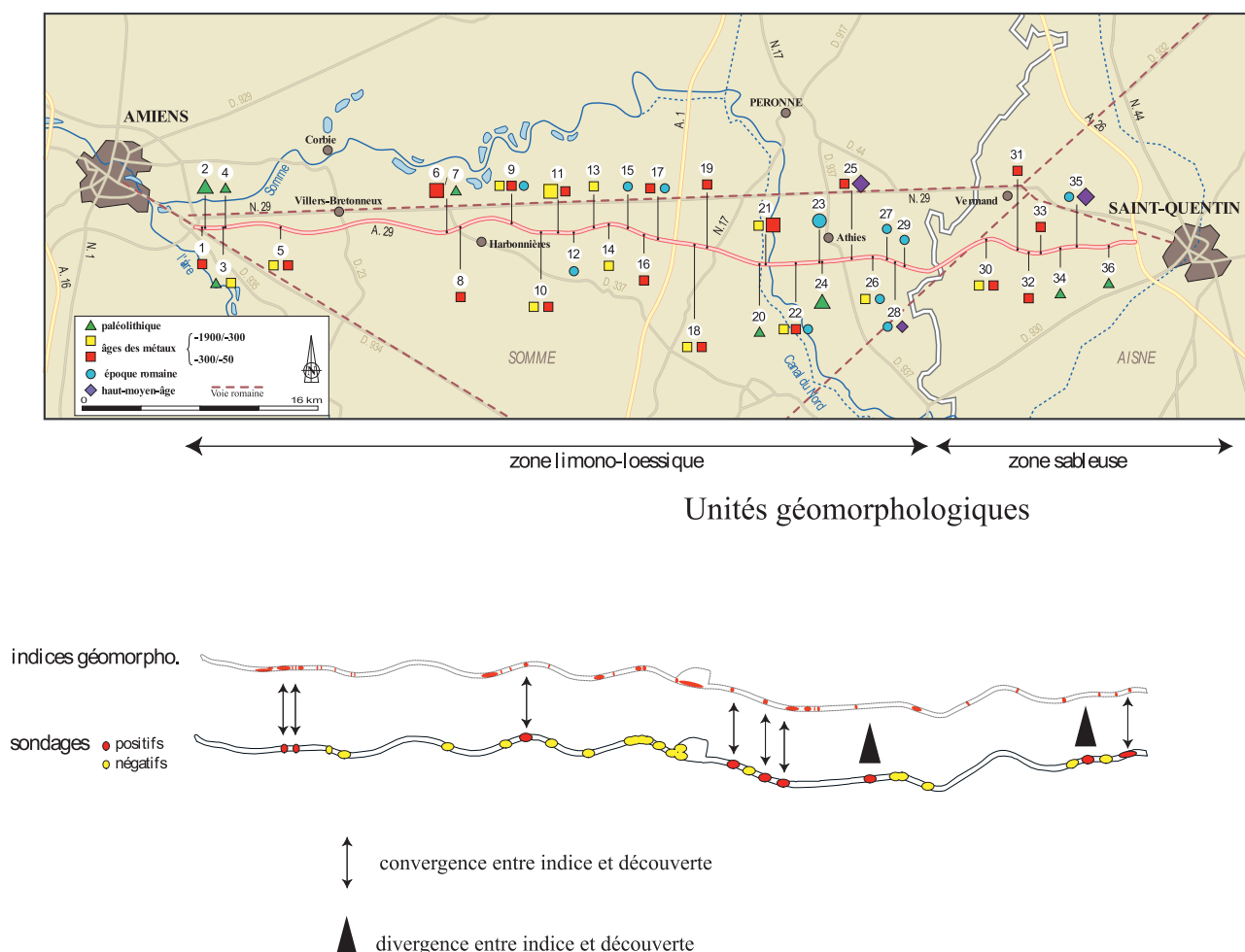


Fig. 4.2 : Exemple de sondage ponctuel (photo L. Deschodt, INRAP).



secteurs *a priori* sensibles et non de manière aléatoire sur les 750 ha d'emprise à sonder (Depaepe et al. 2005).

L'exemple d'un site du Paléolithique supérieur

Il est des situations particulières qui exigent, en plus d'un repérage préalable, une première intervention mécanisée. L'exemple par excellence est l'opération d'archéologie préventive menée en amont de l'aménagement de la plate-forme multimodale de Dourges (Pas-de-Calais)⁶. Située dans le bassin minier, l'emprise s'inscrit dans un paysage fortement modelé par une activité industrielle et un contexte environnemental marqué par une zone alluviale. Le point de départ fut donc une méconnaissance de la nature des sols. Ainsi, une reconnaissance à la pelle mécanique (Fig. 4.2), selon une trame relativement lâche, a été réalisée dans le but d'appréhender la stratigraphie et le potentiel archéologique, de préparer les sondages et d'adjoindre une équipe appropriée (Blancquaert & Deschodt 2005). À ces étapes préparatoires ayant pour but d'identifier les grandes unités géomorphologiques, de préciser et d'estimer les potentialités à l'intérieur de chacune de ces unités par l'appréciation des bilans sédimentaires, des contraintes d'accès aux niveaux et des aspects taphonomiques, succèdent les sondages mécaniques intrusifs.

Les sondages profonds

Localisés selon les résultats du repérage préalable, ces sondages d'une profondeur moyenne de 4 m ont pour objectifs de tester ces zones, de vérifier les indices géomorphologiques (validation de l'étude préalable) et de découvrir des sites. Leur réalisation demande un personnel spécialisé, possédant des connaissances en géologie, en géomorphologie et bien évidemment en Préhistoire. Plusieurs techniques existent, en puits (Fig. 4.3), en cuvette (Fig. 4.4), en tranchée (Fig. 4.5), etc., et détiennent des caractéristiques, voire des contraintes, propres (Depaepe et al. 2005). Leur utilisation

dépend de plusieurs critères : superficie à tester, puissance sédimentaire supposée, facilités d'accès, etc. Toutefois, un critère incontournable est le temps que l'on souhaite accorder à la phase de sondages, soit le rapport efficacité – coût. Enfin, ces sondages profonds vont de paire avec des problèmes spécifiques : la mise en sécurité, la cote de décaissement (de l'ouvrage de génie civil) et la surface d'ouverture. Quelque soit la technique utilisée, le rapport de sondages doit fournir la localisation précise des sondages effectués, la cote atteinte, le log stratigraphique soit de tous les sondages, soit de chaque sondage positif, une première approche taphonomique, une estimation de l'extension potentielle du site découvert, enfin une proposition de hiérarchisation des résultats. L'enjeu majeur étant d'aboutir à un programme raisonné de fouilles à mettre en œuvre, sur base d'arguments de programmation et de problématiques scientifiques. La recherche systématique menée dans le Nord de la France pendant une quinzaine d'année a permis de

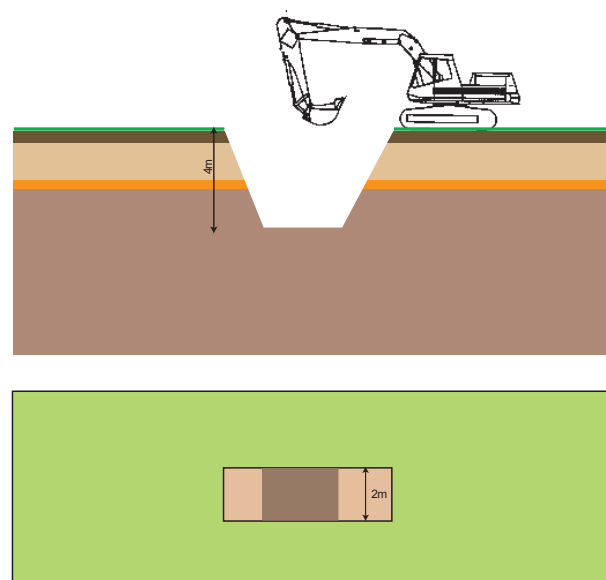


Fig. 4.3 : Technique de sondage en puits.



Fig. 4.4 : Sondage en cuvette
(photo J.-L. Loch, INRAP).

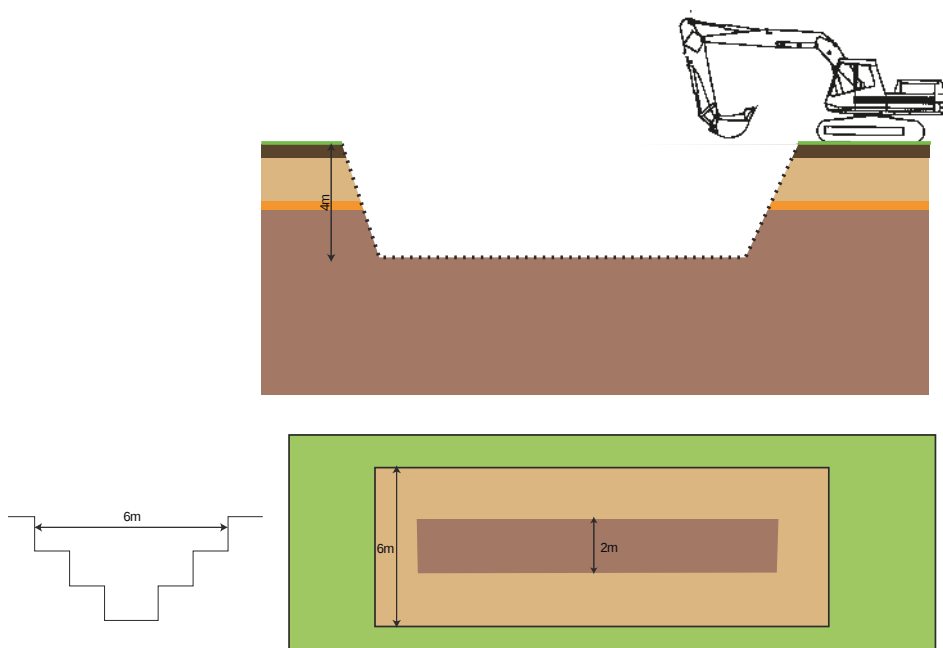


Fig. 4.5 : Technique de
sondage en tranchée.

découvrir et de fouiller près de cinquante sites paléolithiques (dont 45 niveaux du Paléolithique moyen récent, soit entre 135 000 et 35 000).

Les sondages superficiels

En opposition aux sondages profonds, les sondages dits « superficiels » car peu encaissés sont réalisés en tranchées, continues ou en quinconce, au moyen d'une pelle hydraulique à godet lisse de 2 à 3 m de largeur. L'historique de ce procédé permet d'illustrer, sur une durée de trente ans, l'évolution lente de cette pratique maintenant communément appliquée en archéologie préventive. Les interventions archéologiques du projet de l'autoroute A 29 (Le Havre – Saint-Quentin) échelonnées sur 15 ans, de 1991 à 2005, en témoignent. D'abord arbitraire et dépendant du bon vouloir des exploitants agricoles d'autoriser l'accès aux terrains, la sélection de l'emplacement des sondages fut par la suite imposée, non pas par des critères scientifiques, mais par le type de construction autoroutière, en déblai ou en remblai.

Enfin, depuis une dizaine d'années, les campagnes de sondages sont devenues de plus en plus systématiques (Fig. 4.6) et motivées en grande partie par le postulat que tout terrain peut renfermer une information potentielle. Nombreuses sont les interventions réalisées sur des projets, toute superficie confondue et auparavant vierge d'indices archéologiques, qui ont livré des résultats particulièrement enrichissants.

Exemples surfaciques et linéaires

Qu'il s'agit d'une opération de type surfacique telle que la plate-forme multimodale de Dourges explorée sur 175 ha ou d'un tracé linéaire tel que l'autoroute A 19 (Artenay–Courtenay) diagnostiquée sur 1 450 ha, ce sont les sondages systématiques qui ont permis de détecter respectivement 15 et 120 indices archéologiques. Sur le TGV-Est (Paris–Metz) ce sont plus de 400 indices sur un tracé de 300 km, soit une superficie de 3 000 ha. Ces exemples confirment la présence, en moyenne, d'un site tous les 10 ha. Une réelle estimation du potentiel



Fig. 4.6 : Sondages systématiques (photo INRAP).

archéologique est alors possible et permet de mieux encadrer les fouilles, tant en terme de besoins, que de programmation scientifique.

Le décapage exhaustif

Il s'agit d'un exemple particulier, le seul pourtant qui peut être considéré comme fiable, assurant une reconnaissance satisfaisante car partant d'un décapage intégral des surfaces concernées.

L'exemple d'un programme systématique d'archéologie préventive

Il s'agit du programme de surveillance et d'étude archéologique des sablières de la moyenne vallée de l'Oise (Malrain & Pinard 2006). Mis en place en 1987 dans le but ultime d'anticiper la destruction massive qu'allaient inévitablement entraîner l'extraction de sable, il prit fin seulement en 2000. Ainsi, en treize ans, plus de 600 ha ont été décapés de façon exhaustive pour étudier les occupations humaines d'une micro aire géographique. Ce suivi intensif a conduit à la fouille d'une centaine de sites depuis le Paléolithique jusqu'au Moyen Âge.

Peu importe la méthode de détection intrusive, chacune fait l'objet d'un rapport de diagnostic décrivant les résultats obtenus. Un inventaire des découvertes, des structures et du mobilier, ainsi que de la documentation graphique engendrée complète le dossier. Sur la base de ces rapports, l'état ordonne ou non, la réalisation d'une fouille. Les critères de sélection seront discutés ultérieurement.

Les fouilles

Dès le moment qu'il a été décidé de passer à la fouille, le site est généralement décapé dans sa totalité tout en respectant les limites de l'aménagement futur. Ce décapage est entièrement mécanisé et permet donc la mise au jour de l'ensemble des structures archéologiques conservées. À cette première étape succède le relevé sur plan, par un topographe, de tous les indices, archéologiques ou non⁷, et de leur fouille, soit exhaustive, soit par moitié visant néanmoins un échantillonnage statistiquement représentatif. La fouille peut être manuelle, parfois mécanisée en fonction de la nature des structures et selon des procédures assurant ici encore la représentativité de l'échantillon.

Quant aux fouilles réalisées sur les tracés linéaires, tels les autoroutes et les lignes à grande vitesse (LGV), les techniques sont identiques nonobstant la contrainte de largeur du tracé menant à une image tronquée du site, la linéarité et l'étroitesse⁸ obligent. L'image partielle empêche souvent une vision spatiale étendue de l'occupation et peut biaiser les interprétations concernant son fonctionnement, des récurrences, etc. Toutefois, les interventions archéologiques sur des projets linéaires ne sont pas négligeables car elles offrent un aperçu des potentialités archéologiques d'une région « traversée » ; sorte de « désenclavement archéologique ». De plus, ces aménagements en attirent d'autres dans leurs périphéries. Ces projets supplémentaires, qu'il s'agisse de rétablissements des routes existantes, du développement de

zones d'activité concertée (ZAC), etc., feront également l'objet d'interventions archéologiques et permettront de compléter les plans et de reconsidérer les hypothèses formulées lors des fouilles réalisées sur le linéaire.

En fonction des opérations, les surfaces décapées à l'occasion des fouilles peuvent être très diverses. Ainsi, à partir des 120 indices de sites découverts sur les 1450 ha du tracé de l'autoroute A 19 (région Centre), 30 ont abouti à une fouille totalisant 53,2 ha, soit 3,7 %. Quant aux fouilles réalisées sur les projets de type surfacique, tels que la plate-forme multimodale « Delta³ » de Dourges ou encore le parc d'activité économique « Actiparc » d'Arras (Pas-de-Calais), elles ont permis de décapier respectivement 21 et 39 ha, soit 15 % et 13 %. En accumulant ces surfaces fouillées à celles ouvertes par les tranchées de sondages, on obtient alors 32,7 et 63 ha, soit 23 et 21 % de la superficie explorée. Selon la nature du site, le type d'aménagement et les prescriptions de l'état, les surfaces des fouilles même varient entre quelques milliers de mètres carrés à une dizaine d'hectare.

L'exemple de la plate-forme aéro-industrielle de Méaulte

La plupart de ces opérations de grande ampleur livrent de toute évidence un éventail de sites toutes périodes

confondues. Ainsi, sur le plateau limoneux de Méaulte (Somme), la fouille de deux maisons du Néolithique final, une nécropole de la fin de l'âge du Bronze, sept habitats gaulois et trois nécropoles gauloises, trois occupations inscrites dans un parcellaire et huit tombes gallo-romaines et enfin un site fortifié du Moyen-Âge, permet de reconstituer l'histoire d'un terroir et de ses occupants sur 4000 ans. L'étude de l'ensemble de la documentation provenant des sondages systématiques réalisés sur 119 ha, ainsi que des fouilles autorisées avant tout de nouvelles approches du paysage archéologique, la maîtrise du sol bien au-delà de l'habitation, information indispensable pour appréhender la dynamique des implantations, l'interaction de l'homme et la nature.

Des sondages à la fouille ... ou comment celle-ci renseigne ceux-là !

Il reste à discuter, si ce n'est à démontrer, la fiabilité du système de sondages systématiques et le rôle incontournable des fouilles de grandes superficies. Rappelons le constat formulé par J. Dubouloz qu'hormis les avancées manifestes obtenues par des sondages ;

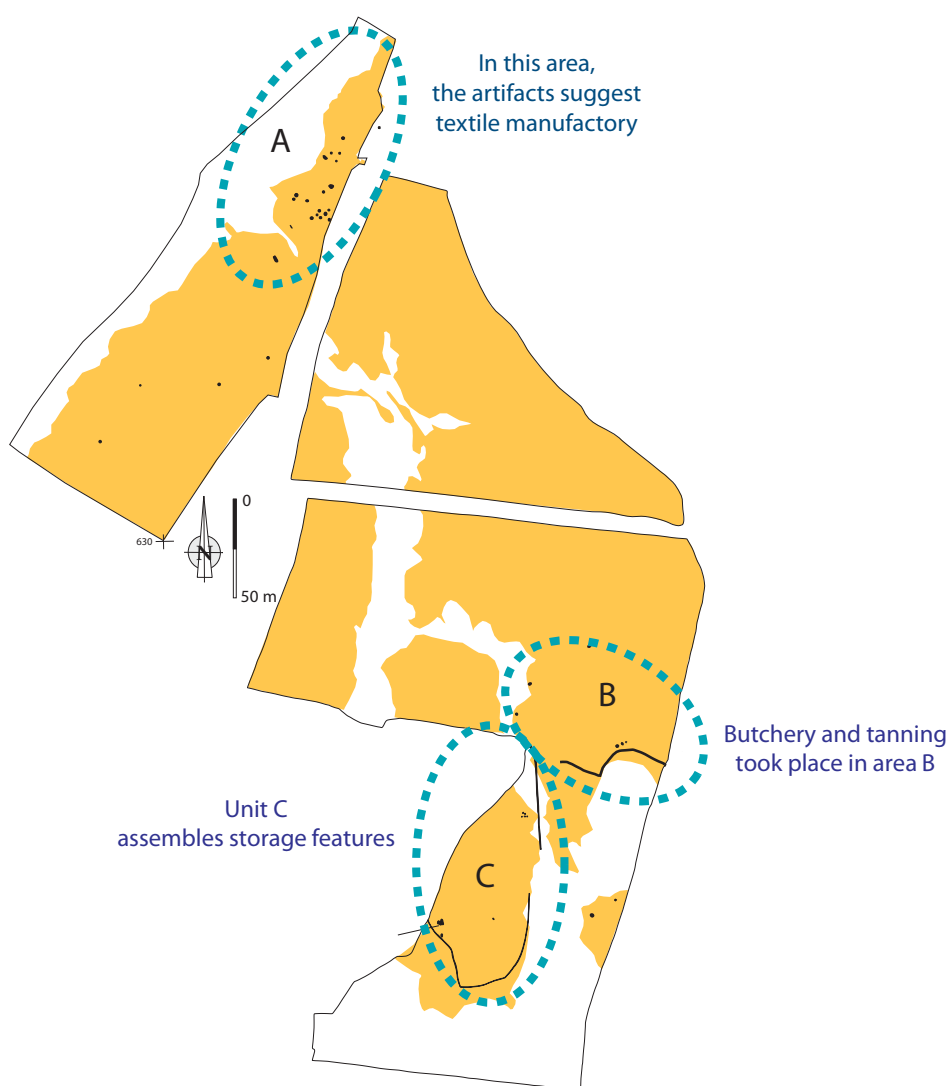
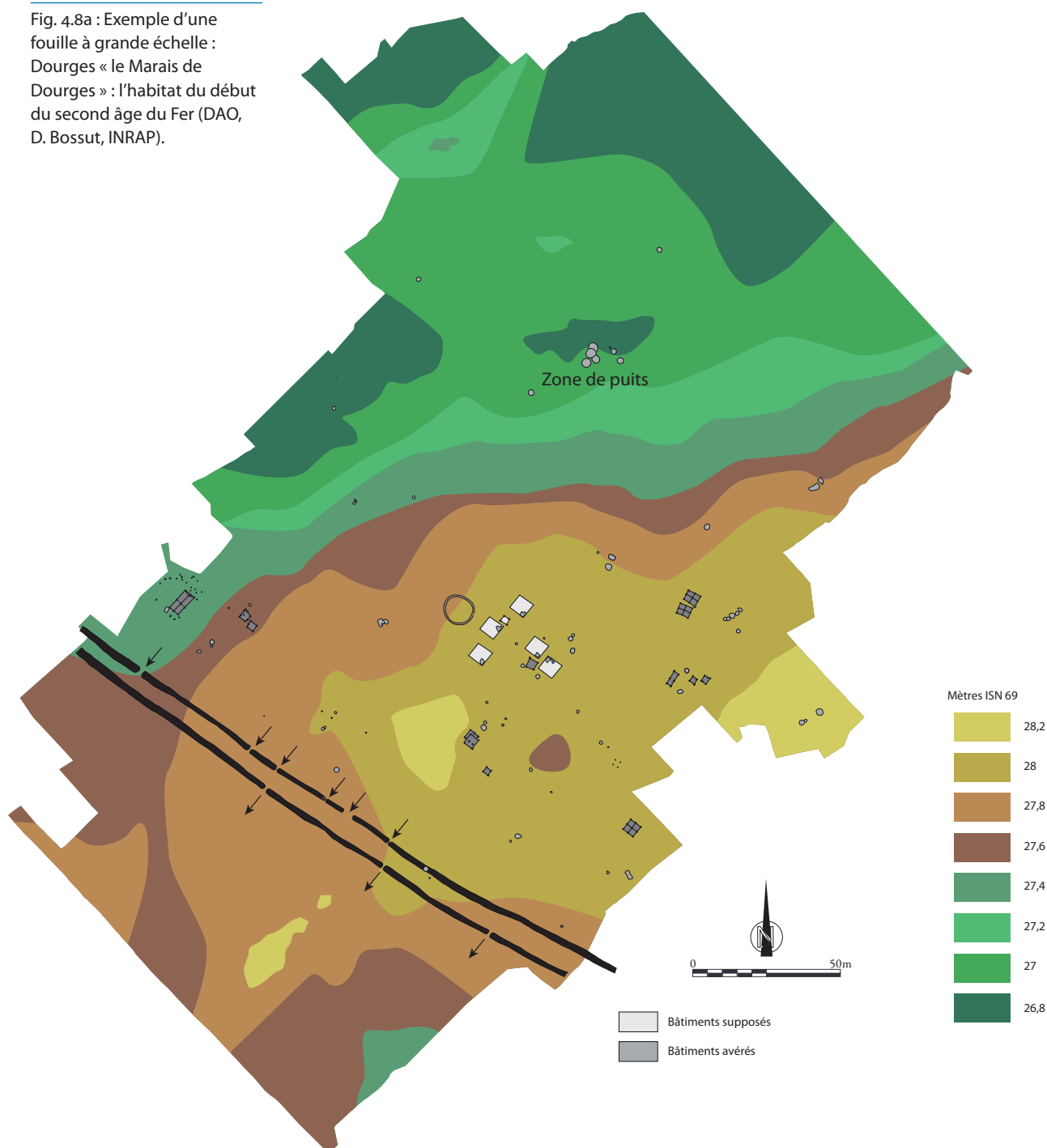


Fig. 4.7 : Exemple de décapage exhaustif : Verberie « les Gâts » : les vestiges ténus du début du second âge du Fer (F. Malrain, INRAP).

Until the second Iron Age, the settlements often consist of some few features; only exhaustive strip off can bring them to light

Fig. 4.8a : Exemple d'une fouille à grande échelle :
 Dourges « le Marais de
 Dourges » : l'habitat du début
 du second âge du Fer (DAO,
 D. Bossut, INRAP).



« l'absence de contrôle a posteriori ne permet pas de juger de la fiabilité des diagnostics négatifs ou peu convaincants [...] » (Dubouloz 2003, 46). En effet, dans un premier temps, les critères retenus pour procéder ou non à une fouille étaient la densité des structures détectées dans les tranchées de sondages, l'étendue des vestiges et la présence de mobilier. Mais petit à petit, et grâce aux fouilles très vastes, une modification dans les mentalités s'est opérée. Le problème peut alors être présenté inversement. La démonstration de ce paradoxe peut être faite à partir de deux exemples concrets de décapages exhaustifs. Sont retenus les « fermes » des 6^e et 5^e siècles avant notre ère de Verberie étudiées dans le cadre du programme de la moyenne vallée de l'Oise d'une part (Malrain et

al. 2005) et celles du site « le Marais de Dourges » à Dourges d'autre part (Blancquaert et Clavel 2004). Dans le premier cas, il a fallu un décapage intégral d'une cinquantaine d'hectares et une étude approfondie pour apprécier à leur juste valeur trois « noyaux » composés de quelques fosses et de tronçons de fossés (Fig. 4.7) entremêlés aux multiples vestiges diachroniques. Ainsi, les structures particulières, soit par leur aménagement, soit par le mobilier qu'elles détiennent, les assemblages céramiques distincts et la configuration spatiale globale ont permis de circonscrire trois unités ou « fermes », chacune étant vouée à une activité spécifique : aire artisanale (filage, tissage), aire de stockage (silos), aire de transformation de produits de l'agriculture (Malrain et al. 2005, 181).

Fig. 4.8b : Exemple d'une fouille à grande échelle :
 Dourges « le Marais de
 Dourges » : l'habitat du
 second âge du Fer (DAO,
 D. Bossut, INRAP).



Dans le second cas, le résultat de la fouille réalisée sur 7 ha et des observations effectuées dans les tranchées et fenêtres tests sur 32 ha au « Marais de Dourges », offrent une image homogène d'une implantation humaine du début du second âge du Fer. Barré par un système de fossés doubles, un habitat groupé s'appuie sur une zone naturelle difficile d'accès. La vie quotidienne s'organise avec la construction de bâtiments sur poteaux, de fosses, silos et puits selon un schéma respectant le relief du lieu (Fig. 4.8a). L'autre spécificité réside dans la pérennité de l'occupation au cours des cinq siècles avant notre ère au moyen de multiples aménagements d'enclos (Fig. 4.8b).

Ces habitats décrits précédemment se distinguent donc par des structures « discrètes » ayant laissé peu de traces au sol et à la répartition lâche. D'autres cas, tels

que les ensembles funéraires discrets du Haut Empire (Blancquaert & Le Goff 2008), permettent d'étendre ce constat à d'autres périodes et contextes. Ce sont donc les acquis scientifiques des fouilles menées sur des grandes surfaces qui autorisent une interprétation de nombreux indices ténus attestés dans les sondages. Ce constat conjugué à la répétition d'observations effectuées dans les tranchées de sondages, enseignent une grande prudence aux archéologues et une prise de conscience est manifeste. Car ces indices, aussi ténus qu'ils soient, sont un signal important qu'il convient de mesurer à sa juste valeur dès la phase de sondages pour ne pas fausser les résultats globaux, ni tirer des conclusions hâtives. Ces modestes témoins contribuent, au même titre que les sites « importants », à l'étude des sociétés anciennes.

Conclusion

Les fouilles réalisées sur de vastes surfaces révèlent la totalité des traces conservées dans le sol, autorisent une approche paléo-environnementale et permettent la collecte exhaustive des vestiges matériels. Celle-ci, à son tour, favorise une exploitation statistique. Ensemble, ces données favorisent une analyse globale car arborant aussi bien l'organisation spatiale intra- et intersites, l'évolution du paysage, que les pratiques de la vie quotidienne, sociale et culturelle. Parallèlement aux avancées scientifiques, cette archéologie des grands espaces contribue à faire évoluer les méthodes d'approche et les techniques de terrain et, au travers de la quantité d'information collectée, à faire progresser les stratégies d'inventorisation et de stockage du mobilier archéologique issu de ces fouilles et de la documentation graphique afférente.

Cette archéologie indissociable des aménagements territoriaux efface habilement les divergences éventuelles entre deux visions, patrimoniale et scientifique. Les sondages systématiques, à défaut de pouvoir tout décaper, et les fouilles sont une réponse à la sauvegarde du patrimoine sous forme d'étude et de renouvellement de nos connaissances du passé.

Notes

¹ Placé sous la double tutelle du ministère de la culture et de la communication et du ministère de la recherche, l'INRAP met en œuvre les prescriptions de l'Etat en matière de diagnostic et de fouille. Maître d'ouvrage pour les premières en partage avec les collectivités territoriales, il est opérateur (maître d'œuvre) parmi d'autres pour les secondes.

² En plus de mener les travaux de terrain (le diagnostic et la fouille) et d'en assurer l'exploitation scientifique, la troisième mission porte sur la valorisation et la diffusion auprès d'un large public.

³ Il s'agit des Services Régionaux de l'Archéologie (SRA). Ils dépendent de la Direction Régionale des Affaires Culturelles (DRAC) du Ministère de la Culture et de la Communication (MCC)

⁴ Celles-ci sont généralement réalisées plus en amont dans le cadre de l'avant-projet ou donc de l'étude d'impact.

⁵ Elles peuvent être réalisées dans le cadre de l'avant-projet par les SRA de l'Etat, soit par des bureaux d'études à la demande de l'aménageur, mais elles peuvent également faire l'objet d'une prescription dans le cadre du diagnostic en archéologie préventive, et sont alors effectuées par l'INRAP ou les collectivités territoriales.

⁶ Il convient de préciser que cette opération a été réalisée avant la loi 2001, modifiée en 2003.

⁷ Il s'agit de phénomènes qui se révéleront être des faits naturels (sols polygonaux, châblis, terriers...).

⁸ Les tracés linéaires ne forment qu'une bande de 40 à 60 m de large, dimensions insuffisantes à une vision complète de l'occupation.

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5 | Contribution des fouilles de grande ampleur à la connaissance des campagnes de la fin de l'Âge du Fer et de l'époque romaine : un exemple du sud de la France, Nîmes et ses campagnes

Jean-Pierre Giraud

Une des missions essentielles du Ministère de la culture est la protection du patrimoine et notamment celle du patrimoine archéologique. Parvenir à cette protection a été un des défis qu'il a eu à relever depuis sa création. Les principaux articles de la première loi portant réglementation des fouilles archéologiques, adoptée en septembre 1941 et validée en 1945, subordonnent l'ouverture de toute fouille archéologique à l'autorisation du ministère chargé de la culture, rendent obligatoire la déclaration immédiate de toute découverte fortuite à l'administration et prévoient, pour le service public, la possibilité d'entreprendre les fouilles qui sembleraient nécessaires. Cependant, promulguée à une époque où la France rurale était encore prédominante, où les villes historiques n'avaient guère connu de bouleversements de leur sous-sol, cette législation n'avait pas prévu les destructions massives des gisements archéologiques provoqués notamment par les travaux de reconstruction de l'après-guerre puis par la croissance économique des années 1970.

Dans les années 1970, les métropoles régionales commencent à se doter de leurs premiers parcs de stationnement souterrain ; la construction de nouvelles lignes de métropolitain vient tout juste d'être entreprise et provoque des destructions massives et le développement du réseau d'autoroute n'a permis que des sauvetages archéologiques sans moyens. Ces « scandales » retiennent l'attention au point qu'un rapport fut demandé par le Ministère de la culture en 1974 à Jacques Soustelle qui préconisa la création d'une carte archéologique, le renforcement en moyens et en personnels des services de l'archéologie et la création d'un Fonds d'intervention pour l'archéologie de sauvetage. En parallèle, la législation se renforce : c'est ainsi que depuis 1977, le Code de l'urbanisme, donne la possibilité de refuser un permis de construire ou de subordonner son accord au respect de prescriptions spéciales « si les constructions sont de nature, par leur localisation, à compromettre la conservation ou la mise en valeur d'un site ou de vestiges archéologiques ». Un décret de 1986 permet la prise en compte de la protection du patrimoine archéologique dans la plupart des procédures d'urbanisme. Forts de cet outil réglementaire, les services de l'État multiplieront les opérations archéologiques de sauvetage.

Ils insèrent progressivement des zonages archéologiques définissant des secteurs où les dossiers d'aménagement leur sont systématiquement transmis. Ces procédures seront reprises et améliorées par la loi de 2001 qui définit le champ de l'archéologie préventive. On rappellera que cette loi organise et encadre l'archéologie préventive ; elle stipule qu'elle comporte deux phases successives : la première, le diagnostic, a pour objectif de déterminer si les travaux d'aménagement prévus sont susceptibles d'affecter le patri-

moine archéologique ; elle s'attache à la détection, à la reconnaissance et à la caractérisation des vestiges archéologiques au moyen d'études documentaires, de prospections, de sondages voire de carottages. Après cette première étape, si des sites archéologiques ont été détectés, la phase ultérieure peut consister en des mesures de protection visant à la conservation des vestiges ou en leur fouille préalablement à leur destruction par les travaux d'aménagement.

Une stratégie régionale

C'est dans ce cadre réglementaire que se sont mis en place des stratégies régionales afin d'optimiser les moyens forcément limités de l'archéologie préventive. Dans la région Languedoc-Roussillon (Fig. 5.1), d'une superficie de 27 376 km² – presque aussi grande que la Belgique –, chaque année le service régional de l'archéologie (sra) reçoit environ 1300 dossiers d'aménagement et près de 180 opérations archéologiques sont prescrites (environ 150 prescriptions de diagnostic et 30 prescriptions de fouilles) (Fig. 5.2). Ces opérations sont inégalement réparties sur l'ensemble du territoire régional. Une partie concerne des aménagements de grande ampleur, tel un tracé autoroutier ou une ligne ferroviaire à grande vitesse ou de grandes Zones d'aménagement concerté atteignant parfois jusqu'à 150 à 200 ha. Dans le cas des aménagements de grande surface, la dimension même des emprises concernées, même sans qu'il ne soit connu de site archéologique, implique une prescription presque systématique : la probabilité de découvrir un site archéologique devient très forte, suivant les secteurs, au-delà d'une superficie de 5 à 10 ha. Ailleurs, c'est la présence de sites déjà connus sur l'emprise de l'aménagement ou dans sa proximité qui motive la décision de prescrire une opération archéologique. Cependant, le service régional de l'archéologie a choisi des zones tests en raison d'enjeux archéologiques et historiques particuliers, dans des secteurs qui semblaient aptes à répondre à certaines problématiques : les villes antiques de Narbonne et de Béziers et leurs environs, ou bien encore celle de Nîmes. Dans ce dernier cas, il y avait la conjonction de connaissances anciennes importantes, récemment actualisées (Fiches & Veyrac 1997; Monteil 1999), et une activité d'aménagement forte depuis le milieu des années 1990.

La plaine du Vistre, un objet d'étude

Dès le début des années 1990, un projet de recherche émergeait sous la forme d'un projet collectif de recherche d'archéologie spatiale et de prospection

Fig. 5.1 : Carte de localisation de Nîmes (Gard) dans la région Languedoc-Roussillon (J.-P. Giraud).

inventaire (projet « Nîmes Rurbain » coordonné par Pierre Poupet). Il devait stimuler l'action du sra dans la systématisation du suivi archéologique des secteurs soumis à des projets d'aménagement sur le territoire de la commune de Nîmes. C'est ainsi qu'a été mis en place un zonage archéologique sur la commune de Nîmes (Fig. 5.3) couvrant environ la moitié de la superficie de la commune. Ce zonage fut rapidement élargi aux communes voisines (Bouillargues, Caissargues, Marguerittes, Milhaud, Rodilhan, puis Uchaud et Bernis Aubord) prenant en compte le territoire de l'agglomération nîmoise. Ce territoire correspond aussi à la zone qui est la plus touchée par les programmes d'aménagement liés à l'expansion urbaine et sub-urbaine et les réseaux de communication sur la rive droite du Vistre. Il couvre ainsi le finage traditionnellement associé à l'agglomération : il s'agit, au nord, de la zone des collines et des plateaux calcaires des Garrigues et de son piémont limoneux, vaste coteau de pente faible dominant la plaine limoneuse alluviale du Vistre (la Vistrenque) qui forme une dépression de 5 à 7 km de large, bordée au sud-est par les costières de Nîmes, ensemble de terrasses alluviales façonnées par le Rhône au Quaternaire ancien et moyen. Le secteur inclus dans le zonage archéologique couvre une superficie de 80 km². Depuis 1991, l'ensemble des terrains a été parcouru par des prospections pédestres et près de 350 ha ont fait l'objet d'une évaluation archéologique (Fig. 5.4). Le nombre et la superficie de ces opérations d'archéologie rurale a subi une rapide progression à partir de 1997 avec le développement des grands aménagements notamment ceux entrepris dans le cadre du Plan de protection contre les inondations mis en place après les inondations catastrophiques de 1988 (Fig. 5.5). Depuis l'origine, plus de 200 diagnostics ont été mis en œuvre. En 5 ans, pour la

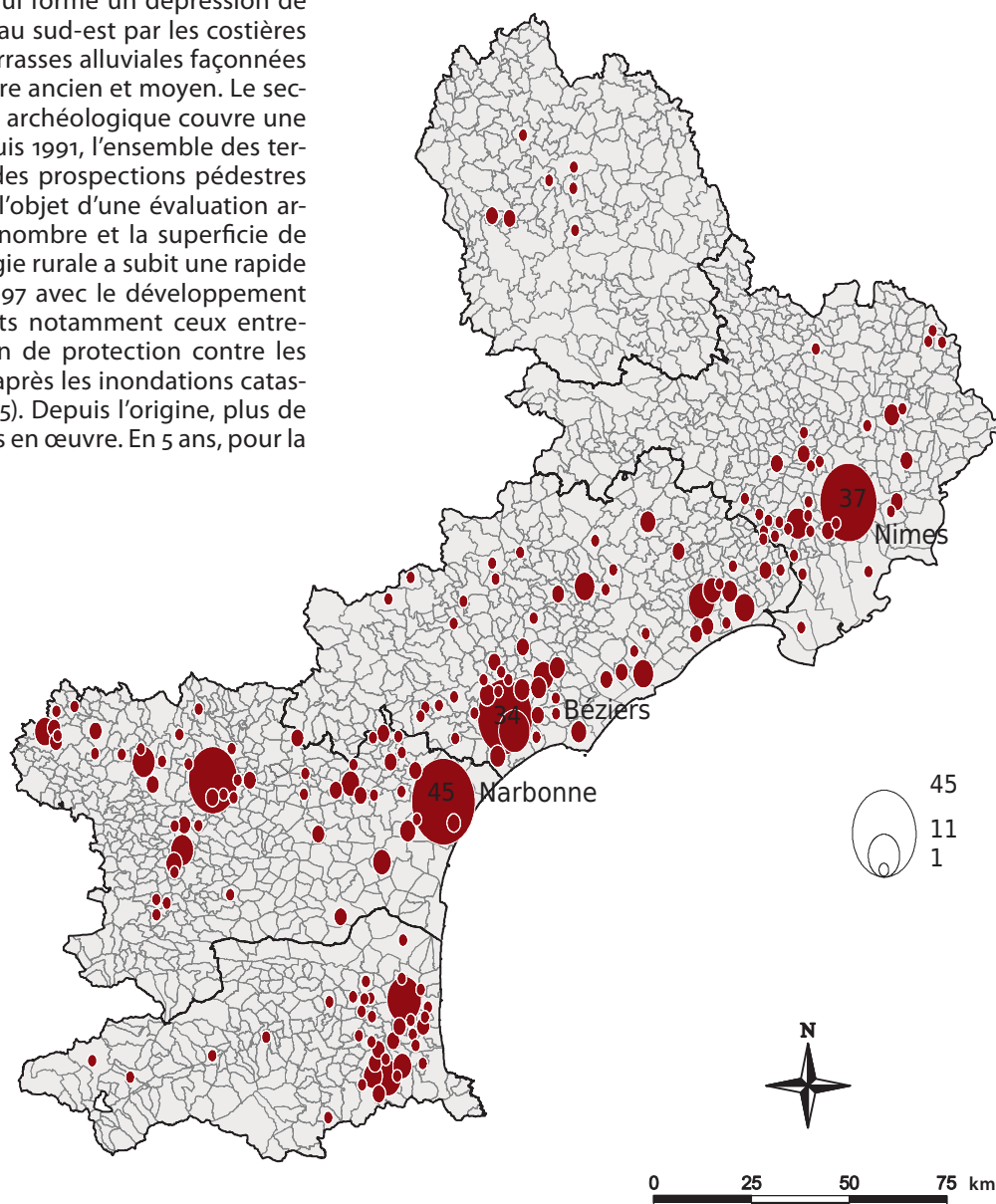
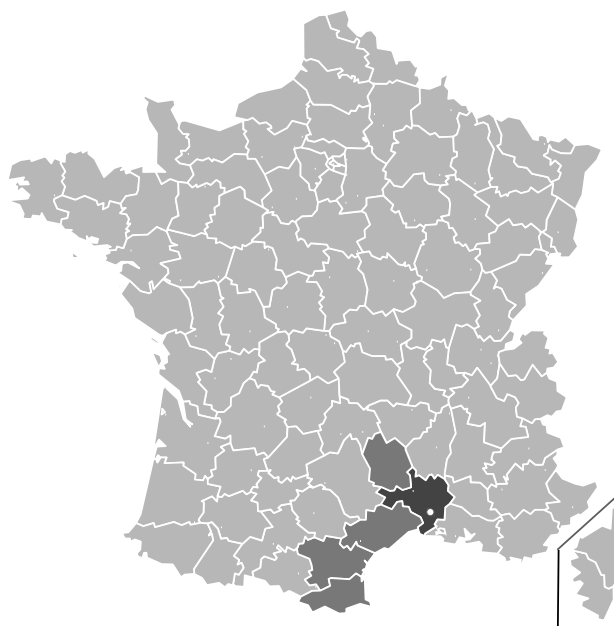


Fig. 5.2 : Les opérations de diagnostic archéologique entre 2003 et 2006 (I. Bermont, sra Languedoc-Roussillon).

Fig. 5.4 : Carte de l'emprise des diagnostics (Y. Lelièvre, INRAP).



des surfaces ; les autres interventions ont une surface moyenne de 3,5 ha. En ce qui concerne les fouilles, une vingtaine ont été prescrites depuis 2002 dont 13 en milieu rural et 9 en milieu urbain. La superficie moyenne des opérations rurales est de 1,25 ha, la plus grande atteignant 3,1 ha ; les fouilles urbaines ont une surface moyenne d'environ 2000 m², mais la plus grande, la fouille d'un parking souterrain, avenue Jean-Jaurès, a atteint une superficie de près de 6600 m² et c'est la plus grande fouille urbaine entreprise à Nîmes depuis l'origine. Cependant, ces chiffres doivent être remis en perspective : les 350 ha explorés ne représentent à peine 4,5 % de la zone d'étude¹. Mais concentrés dans un secteur situé au sud de la ville de Nîmes, ils apportent néanmoins un éclairage nouveau sur les campagnes proches de la ville de Nîmes.

Les méthodes de diagnostic sont celles employées de façon générale en France : après une étude documentaire plus ou moins développée permettant de définir le contexte archéologique et sédimentaire des emprises à traiter, l'opération de diagnostic consiste le plus souvent en l'ouverture de tranchées à la pelle mécanique réparties selon une trame régulière couvrant

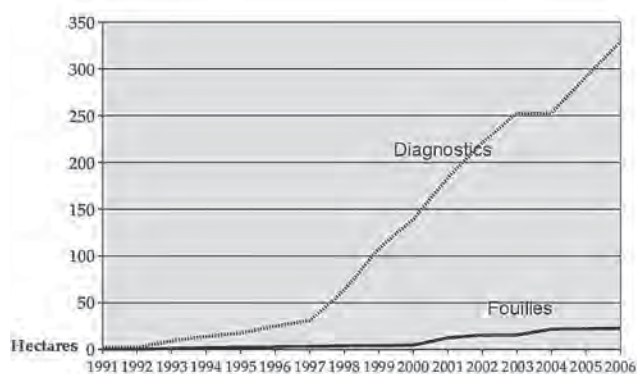


Fig. 5.5 : Cumul des surfaces des diagnostics et des fouilles.

entre 8 et 13 % de la surface évaluée. Ces tranchées systématiques sont, partout où la compréhension, la caractérisation des vestiges mises au jour et leur délimitation l'exigent, élargies par des décapages complémentaires limités (Fig. 5.6). Mais ce qui fait tout l'intérêt et l'originalité de cette zone test, c'est le traitement scientifique qui lui est apporté.

Un projet de recherche

En effet, depuis 1999, prenant en quelque sorte la suite du premier projet du début des années 1990, un projet de recherche structuré sous la forme d'un Projet collectif de recherche² se développe afin d'exploiter et de diffuser à la communauté scientifique les résultats des travaux réalisés à l'occasion des opérations d'archéologie préventive sur le territoire nîmois. Son contour géographique est celui retenu par le sra pour le suivi systématique des secteurs soumis à des projets d'aménagement. Ce PCR, intitulé « Espace Rural et occupation du sol de la région nîmoise de la Préhistoire récente à l'époque moderne », coordonné par Jean-Yves Breuil, ingénieur à l'Inrap, regroupe actuellement 45 archéologues investis dans la région nîmoise : une trentaine appartiennent à l'Inrap, 4 au sra de Languedoc-Roussillon, 4 au CNRS, 5 à l'université et 2 aux services culturels de la ville de Nîmes.

Si le projet collectif s'est beaucoup engagé ces dernières années dans l'exploitation des données provenant des opérations en milieu rural, ses membres s'investissent aussi dans la réalisation de l'Atlas topographique de Nîmes dans le cadre du projet d'Atlas topographique des villes de Gaule Méridionale portant sur les chefs-lieux de cités antiques des provinces augustéennes de Narbonnaise et des Alpes-maritimes. Le projet nîmois, soutenu par le Ministère de la culture et par l'Inrap, est coordonné par Marc Célié de l'Inrap et Martial Monteil, maître de conférences à l'université de Nantes.

Le rôle du PCR n'est pas limité à la recherche, il est associé par le sra à la prise de décisions concernant la réalisation de diagnostic et de leur continuation par

une fouille dans la zone d'étude. Le diagnostic est souvent la seule intervention sur le terrain, si on doit renoncer à la fouille parce que le projet d'aménagement s'interrompt ou que des mesures de protection sont préférées – par exemple parce que les conditions d'enfouissement des vestiges le permettent – ou bien encore lorsque la qualité des vestiges découverts (état de conservation, typologie, densité) ne justifie pas une fouille, ou au contraire impose la conservation du site par sa protection au titre de Monuments historiques ou par le déplacement de l'aménagement. Aussi dans cette zone test, le service régional de l'archéologie et l'Inrap, qui est pour l'instant le seul opérateur d'archéologie préventive à y réaliser des opérations de diagnostic, se sont entendu pour qu'au cours de cette opération préliminaire, le maximum de données scientifiques utiles à la réponses aux problématiques du projet collectif de recherche soient recueillis selon des protocoles partagés. Le but est d'abord de pouvoir effectuer de la façon la plus éclairée, le choix d'approfondir la recherche par une opération de fouille. Si ce n'est pas le cas, les données essentielles, c'est-à-dire la chronologie précise des structures, l'analyse de leur fonction et, pour toutes les structures linéaires qui peuvent participer à la compréhension de l'organisation et de la structuration des occupations, l'enregistrement topographique précis et l'analyse des relations stratigraphiques, soient au maximum renseignées afin de ne pas créer une lacune documentaire trop importante.

Ces opérations de diagnostic sont entreprises le plus souvent par des agents de l'Inrap parties prenantes du Projet collectif de recherche et donc parfaitement

Fig. 5.6 : Un diagnostic sur une ZAC de la région nîmoise.



conscients des enjeux documentaires et en pleine possession des protocoles d'enregistrement couramment employés. Ainsi, dès cette phase, des éléments de compréhension sur l'occupation du sol peuvent être perçus : distinction de zones d'habitat et d'espaces d'habitat (Fig. 5.7).

C'est ainsi que peuvent s'accumuler les indices sur l'organisation des campagnes dans ce secteur.

Il est aussi évident que lorsqu'une fouille est décidée, elle prend en compte les préoccupations et les problématiques scientifiques du projet collectif, même si elles sont marginales par rapport aux problématiques principales du gisement fouillé.

Durant les diagnostics et les fouilles, il est procédé à des prélèvements d'échantillons afin de pouvoir mener les analyses environnementales nécessaires à la reconstitution du paysage et à la compréhension de l'emprise anthropique dans ce secteur depuis le début de l'holocène. Une démarche cohérente géomorphologique et paléoenvironnementale a été mise en place pour exploiter les séries de profils sédimentaires et d'échantillons recueillis dans cette mosaïque d'interventions et notamment celles liées au PPCI, avec l'intervention systématique de Pascale Chevillot. Couplé à des analyses malacologiques (Martin 2005) et s'appuyant sur le cadre chronologique bâti par les archéologues, elle permet d'ébaucher le tableau de l'évolution sédimentaire de la plaine du Vistre. Dans

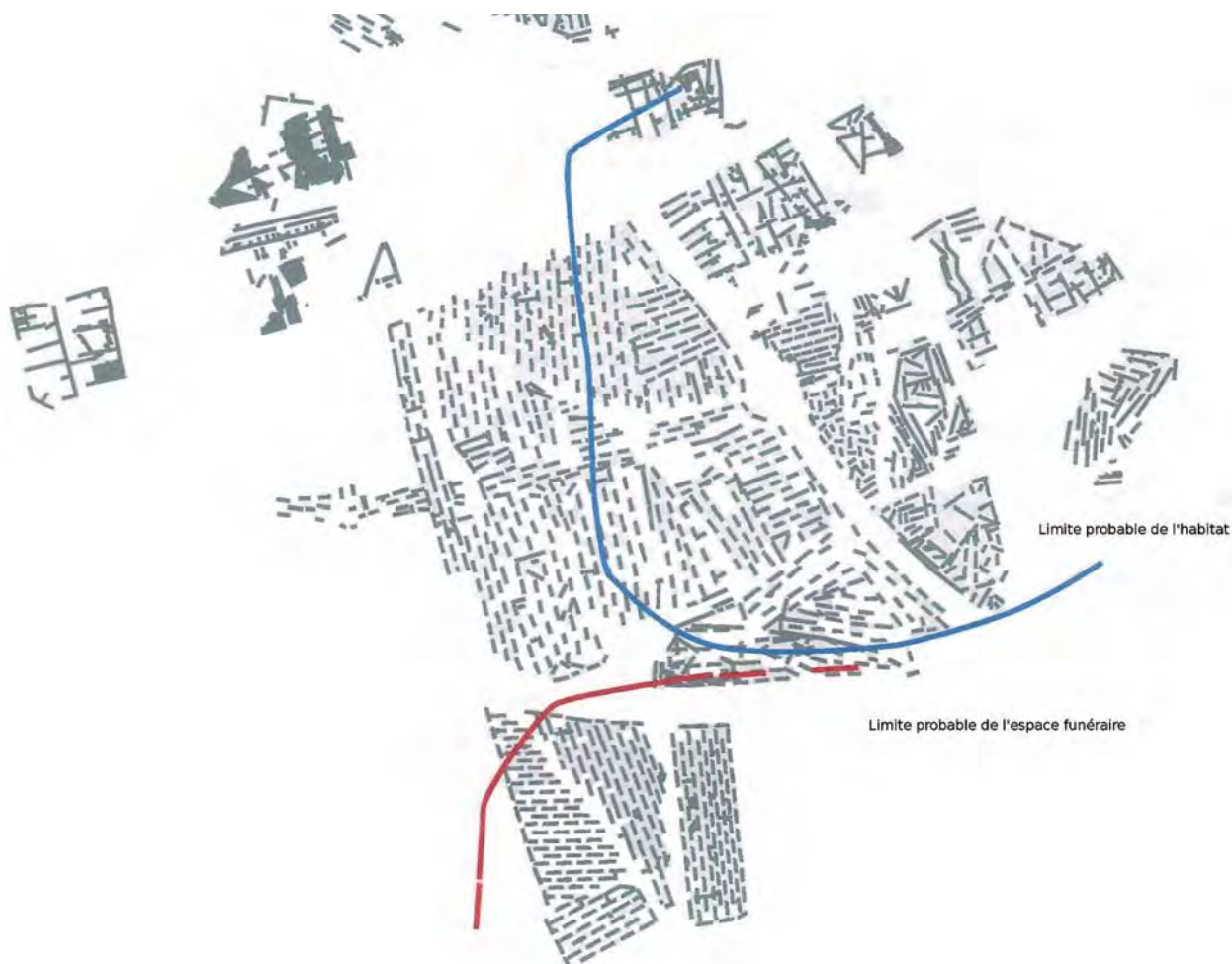
ce domaine, les premiers résultats ont déjà fait l'objet de publications (cf. Martin 2005).

Les résultats

Les diagnostics systématiques et les fouilles qui en ont découlé entrepris depuis 1990 ont livrés de multiples résultats, exposés par les membres du PCR dans les rapports d'opérations de diagnostic et de fouilles, ainsi que dans les rapports annuels du projet collectif rendus au sra. Plusieurs publications – mentionnées en bibliographie – en rendent compte à la communauté scientifique. Une exposition récente a présenté au grand public les résultats obtenus dans le domaine du funéraire, en échos à la publication des tombes et espaces funéraires de la fin de l'Âge du Fer et du début de l'époque romaine sous la direction de V. Bel (Bel et al. 2008). On ne trouvera ici qu'une brève présentation synthétique de ces résultats. Les plus importants sont les suivants :

La multiplication des sondages, l'ampleur des surfaces traitées et la variété de leur implantation a permis la mise en évidence des premières occupations de la fin du paléolithique supérieur et de l'épipaléolithique dans la région de Nîmes. Leur étude bénéficie du concours de Frédéric Bazile, directeur de recherche au CNRS.

Fig. 5.7 : Mise en évidence d'espaces différenciés à partir du résultat de diagnostic (ZAC de Mas de Vignoles et du Mas Neuf) PCR « Espaces rural et occupation du sol de la région nîmoise de la Préhistoire récente à l'époque moderne ».



Il est aussi apparu une grande densité de sites néolithiques : une cinquantaine reconnus à ce jour. Toutes les étapes du néolithique sont représentées depuis le Néolithique ancien cardial (1 site) et épi-cardial (4 sites), relativement rare, le Néolithique moyen chasséen (1 dizaine de sites) mais surtout le Néolithique final *senso latu* (Néolithique récent, Ferrières, Fonbouisse), période où se multiplient les sites structurés présentant des ensembles fossoyés, des enclos, des fosses de types variés, des puits etc. Une publication préliminaire présente les premiers acquis concernant cette période (Breuil 2003).

Mais parmi les résultats les plus importants, figure la mise en évidence d'une forte occupation de l'Âge du Fer débutant dès la fin du VI^e siècle av. J.-C. et le début du V^e, et donc contemporaine de l'apparition de l'habitat aggloméré autour de la source de la Fontaine qui est le noyau constitutif de l'oppidum puis de la ville antique de Nîmes. L'occupation du sol se développe alors, structuré autour des premières voies de communication d'intérêt local, régional ou interrégional qui se mettent en place entre le V^e et le III^e siècle av. J.-C. Les restes de ce peuplement péri-urbain sont nombreux mais leur structuration est difficile à percevoir. Il s'agit essentiellement de fossés qui délimitent des zones d'habitat marquées par des concentrations de trous de poteaux, des puits et des épandages de mobiliers, ou encore des parcelles agricoles voire des espaces funéraires.

Ce type d'occupation n'est connu de façon aussi développée nulle part ailleurs en Languedoc-Roussillon et les comparaisons restent difficiles. Ces vestiges reflètent un processus de mise en valeur de terres agricoles et une économie régionale assez florissante. Cependant le statut de ces exploitations rurales et la nature de leur rapport (subordination ?) à l'agglomération naissante de Nîmes restent à préciser (Fig. 5.8).

Au cours des IV^e et III^e siècles av. J.-C., les traces d'habitats et de travaux agricoles sont plus rares et la per-

manence des réseaux parcellaires antérieurs reste à démontrer. Par contre, à partir du milieu du II^e siècle av. J.-C., la ville de Nîmes connaît une phase de croissance et vers le milieu du I^{er} siècle av. J.-C., le tissu urbain couvre 35 à 40 ha. Au même moment, dans la plaine, les indices d'occupation, perçus lors des diagnostics, sont nombreux et révèlent majoritairement des fossés, des portions de champs, des voies, traduisant l'importance de la mise en valeur des sols de la plaine à l'époque républicaine. Les parcellaires des II^e/I^{er} siècles av. notre ère reprennent le découpage antérieur protohistorique, tandis que l'occupation s'étend dans d'autres terroirs peu occupés pendant l'Âge du Fer.

Au sein de cette plaine largement exploitée, les décapages ont mis en évidence deux vastes établissements fossoyés, de conception proche, les sites de Magaille Est (fouille Breuil, 1999) et du Gouffre des Bouchers, d'une superficie de 4000 m² (fouilles Pomarèdes et Rascalou, 2002). D'un type encore largement méconnu dans les régions méridionales, ils s'inscrivent dans une tradition protohistorique ; les comparaisons les plus convaincantes peuvent être faites avec les fermes à enclos de l'ouest et du nord de la France, même, si depuis quelques années, l'archéologie préventive fournit quelques exemples régionaux : enclos « pré-augustéens » dans la vallée de l'Aude (Carcassonne/La Cavayère), constructions sur poteau et enclos dans la vallée de l'Hérault (Paulhan/Vareilles, Clermont-l'Hérault/Peyre-Plantade).

Ce sont ces établissements qui vont, entre le milieu du I^{er} siècle av. J.-C. et le début du I^{er} siècle ap. J.-C., jouer un rôle important dans le développement du peuplement rural : les bâtiments de terre et de bois sont alors remplacés par un nouveau type de ferme de plan plus rigide – de 600 à 800 m² – faisant appel à une architecture employant de nouveaux matériaux : solins de pierre, élévations en adobes et couvertures de tuiles.

Fig. 5.8 : Exemple de structuration de l'espace protohistorique, ZAC Mas de Vignoles et ZAC du Mas des Abeilles (d'après Breuil & Séjalon 2004).



Les corps de bâtiment s'organisent autour d'une cour centrale, creusée dans le substrat et aménagée d'un sol de galets, selon un plan en U dont la partie ouverte est tournée vers une voie. Dans un de ces établissements, des dolia, associés à des plantations de vignes, attestent une production de vin. D'autres fermes à cour centrale excavée et à plan ramassé sont attestées sur d'autres sites de la plaine de Nîmes (Fig. 5.9).

Un réseau d'établissements péri-urbains se développe aux deux premiers siècles de notre ère. On en a reconnu 25 dans la zone d'étude, situés pour la plupart entre 2 et 4 km de l'enceinte augustéenne. À partir du début du III^e siècle, le démantèlement d'une partie de ces établissements est effectif. Sur presque un tiers d'entre eux on observe cependant un maintien jusqu'au V^e siècle. Dans ce dispositif, la place des villa semble relativement limitée et sa mise en place en partie tardive. Le centre domanial de Saint-André de Codols, composé de constructions imposantes et étendues sur plus d'un hectare, n'est attesté qu'à partir du III^e siècle ap. J.-C. Ces importants résultats présentés régulièrement à la communauté scientifique par l'équipe du PCR n'ont pu être obtenus que grâce à la conjonction de la politique de zonage archéologique et de prescriptions du service régional de l'archéologie et de l'existence d'une équipe de recherche structurée qui a su exploiter les résultats d'une pratique intensive et extensive de l'archéologie préventive. Tous les espaces disponibles pour nourrir cette recherche ont été investis. Le regroupement de certaines opérations archéologiques a permis d'obtenir

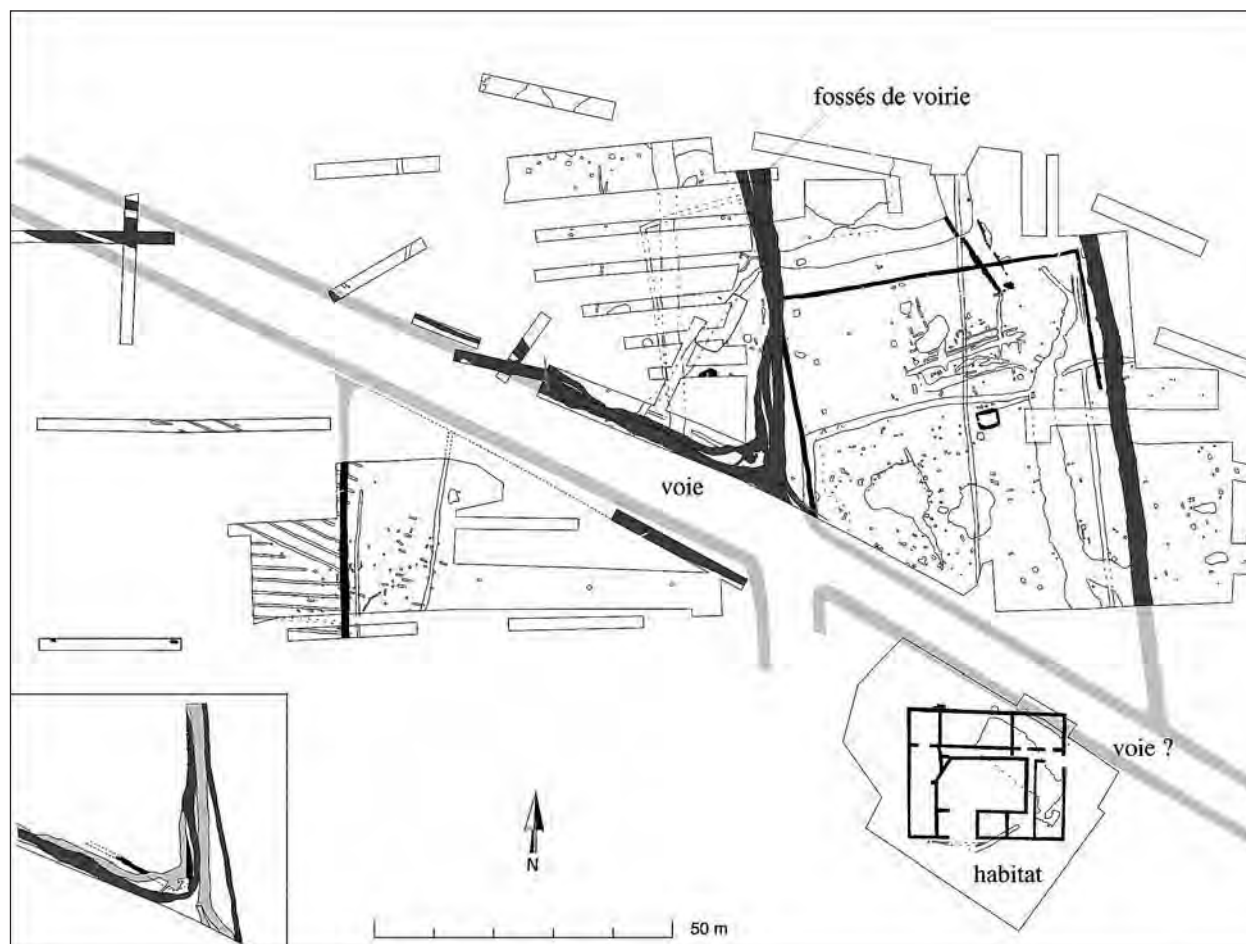
– au bout d'une quinzaine d'années et le traitement de près de 350 ha – des fenêtres cohérentes de plusieurs dizaines d'hectares ; la dispersion des autres constitue autant de « sondages » de grande dimension, sur près de 20 km² autour de la ville de Nîmes. L'ensemble apporte une vision nouvelle sur la structuration de la campagne péri-urbaine et sur la dynamique de son peuplement sur plus d'un millénaire, de la fin du VI^e siècle avant J.-C. au V^e siècle de notre ère, par la reconnaissance des réseaux de voie et de fossés qui structurent le paysage, par la mise en évidence de la juxtaposition d'espaces à vocations différenciées (zones de cultures, zones d'habitat, zones funéraires) et par l'appréhension de la densité et de la dispersion des occupations, montrant ainsi tout l'intérêt des opérations à large échelle.

Notes

- ¹ Par comparaison, une tranche de projet autoroutier concerne des surfaces de l'ordre 350 à 400 ha et un tracé de Ligne à grande vitesse entre 400 et 650 ha.
- ² Les Projets collectifs de recherches (PCR) sont un des types de recherche d'archéologie programmée soutenus par le Ministère de la culture et de la communication

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Fig. 5.9 : Ferme du Gouffres des Bouchers (d'après Pomarède & Rascalou 2002).



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6 | Unveiling Bronze Age, Iron Age and native Roman communities in lower Nijmegen (the Netherlands) – Twelve years of excavations in a fluvial area

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Abstract: After the municipality of Nijmegen was allowed to extend its territory across the river Waal into the Betuwe to effectuate a building programme, the archaeological potential of this area has been prospected and partly exploited. Several strategies are combined: in order to supplement the results of systematic prospection this activity is combined with trial trenching and inspection of ground works, commonly followed by excavation as the necessary solution for the dozens of sites that have been detected. Nineteen hectares of trenches have led to several unexpected results. Among them are the remains of the earliest farmers in the eastern part of the Betuwe (c. 3700–3400 B.C.), a Middle Bronze Age ‘burnt mound’, dozens of Early Iron Age inhumation burials and the indications of a rather intense Romanisation in several spheres of native culture. These topics are dealt with within the framework of settlement, burials, votive deposits and the Roman occupation of the Lower Rhine district.

Nijmegen extending across the river Waal

Until 1996, the municipality of Nijmegen was equated with the elevated town along the river Waal, also the location of the northernmost Roman fortress (*castra*) in the continental part of the Imperium Romanum from about 19 B.C. Within a decade after the start of the Roman occupation an early *vicus*, Oppidum Batavorum, was founded 2 km further west, again near the steep edge bordering the river.¹ Here, on the Valkhof plateau, in the 8th century the palatine of Charlemagne was situated. After Viking raids it was finally rebuilt by Barbarossa and his successors, demolished in 1796, but nowadays still a *lieu de mémoire* for the Dutch.

The prominent military and residential status of Nijmegen has much to do with a cold past, as the town lies on and next to a remnant of the southernmost ice-pushed ridge in the Netherlands, which was formed during the Saalien. The many branches of the river Rhine that broke through this ridge afterwards produced an alluvial plain (fig. 6.1). From about 6000 B.C. this upper part of the Rhine delta shows a set of wide meandering river branches (see especially Berendsen & Stouthamer 2001). Already in late prehistory, the present courses of Rhine and Waal can be detected as the main channel belts of that time, thereby defining the region in between, now called Betuwe, and formerly named Insula Batavorum by Tacitus.

From 1996 onwards, the municipality of Nijmegen was allowed to extend its territory across the river Waal into this alluvial plain to effectuate a building programme called Waalsprong.² The marketgardener’s village of Lent, the only existing residence in the area, was to remain untouched, just extended.

It goes without saying that by this move an area was added with an archaeological potential of a different kind than the Roman towns,³ military strongholds and

canabae south of the river Waal that were the only focus of the archaeological and public attention until recently.

Archaeological potential and strategies

In the 1300 hectares of the newly acquired Betuwe region, around 1990 hardly any protohistoric and no prehistoric sites were known outside the village of Lent.⁴ However, at least several native Roman settlements might be supposed under the clay cover in this homeland of the *Batavi* (Batavians), a tribe well-known by the writings of Tacitus.

In order to be able to prevent destruction of still unknown archaeological sites by the development works, the first thing to do for the municipal archaeological department⁵ was to start a prospection-programme including field-walking and – especially suited for an area covered by fluvial sediments – coring for archaeological indicators like pottery sherds, flint, charcoal and bone. RAAP archaeological consultancy started carrying out the work in 1995. Acquiring the archaeological information was, however, only part of the job. Another aim was to get a grip on the landscape in which the former communities were living.

By means of coring, the sub-surface of the area could be characterised as a myriad of fossil meandering river courses, including many oxbows, residual channels eventually filled up with clay (figs. 6.2 and 6.19). Apart from local Late Pleistocene, partly re-deposited, terrace remains (Kreftenheye IV–VI), Holocene sandy river beds make up the greater part of the Waalsprong area, with flood basins only accounting for a minimal coverage.

Although the sandy and silty deposits had already been covered with a clay layer of at least some decimetres by the early second millennium B.C., these soils were fa-

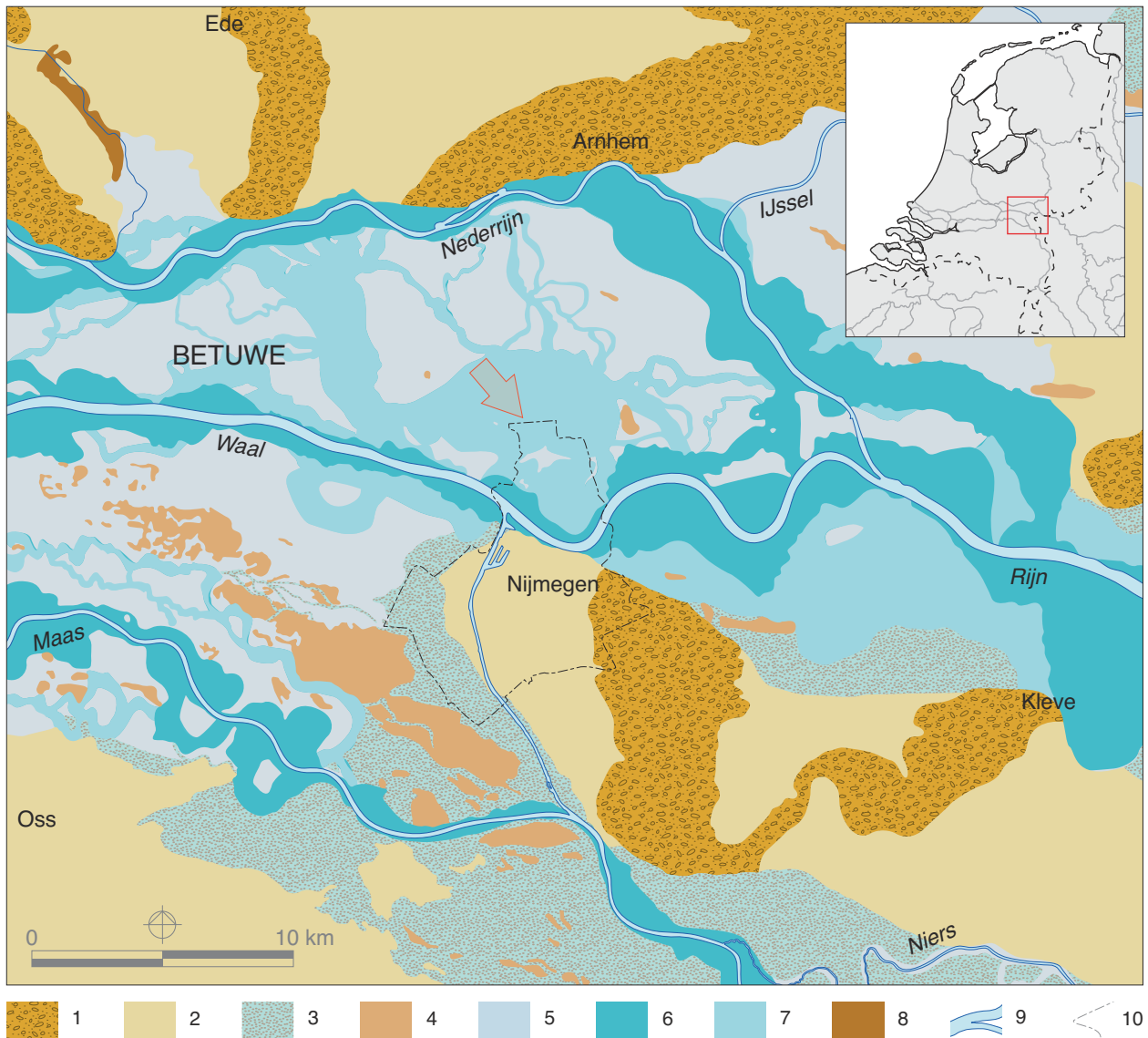


Fig. 6.1: Present day geology of the river area and location of the channel belts in the centuries around the beginning of our era (2000 BP). Inside a channel belt, the course of the river would shift regularly. As such, the width of the active channel belts depicted here is the sum total of shifts that occurred over a period of a few centuries. The Waalsprong area is indicated by an arrow. – 1: ice-pushed ridge from the Saalien; 2: coversand and loess from the Weichselien, local melt water deposit from the Saalien and Weichselien; 3: river terrace/residual channel from the Weichselien; 4: river dune from the final phase of the Weichselien; 5: river deposit from after the Weichselien until today; 6: active channel belt from the first centuries B.C./A.D.; 7: channel belt that became inactive before the Roman period; 8: peat; 9: present-day river channel; 10: municipal border of Nijmegen (adapted from Berendsen & Stouthamer 2001, R. Mols, Bureau Archeologie en Monumenten municipality of Nijmegen [BAMN]).

vourable habitation areas for agricultural communities. As sedimentation since that time has been rather modest, at several locations archaeological mobilia have become exposed in the fields by recent ploughing. The strategy of field-walking and coring has produced a surprisingly great number of new sites, most of them classified as settlement sites. Until the start of the prospection in 1995 not a single prehistoric site was on the map. Already in 2001 this period was the most prolific, counting 32 sites, most of them of Bronze or Iron Age date. The amount of sites from the Roman period, several of them probably starting in the Iron Age, had increased dramatically as well, numbering more than those from the medieval and post-medieval period. Until now about 70 new sites – or at least locations where artefacts were found – have been located by RAAP be-

side the few sites that were already known at the start of the project (fig. 6.2). The sites accompanied by a letter code have come to light in other ways (see below). From 1996 onwards, the digging of trial trenches as well as excavations are being carried out, in most cases by the excavation teams of the municipal Bureau.⁶ At each site that has been discovered at least one or more trial trenches are planned, fieldwork being executed according to the time-schedule of the development works, which will not end before 2020. The strategy of trial trenching has been intensified and extended to areas *between* sites in the last years (fig. 6.3), because of several reasons. Although coring for archaeological sites has proved effective for the location of settlements in the area, various site types are far less likely to be traced in this manner. Both late prehistoric and Roman period burial sites

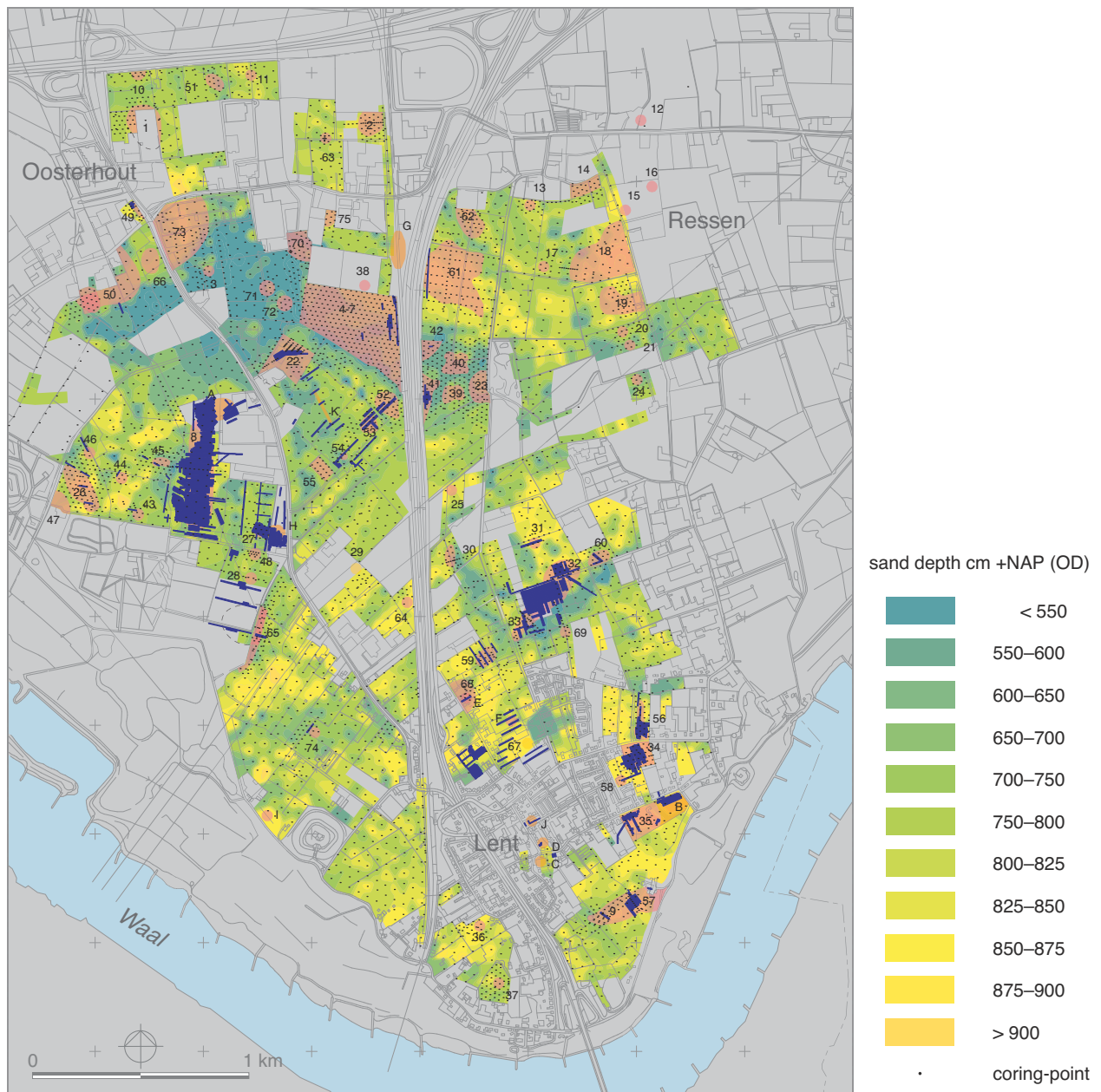
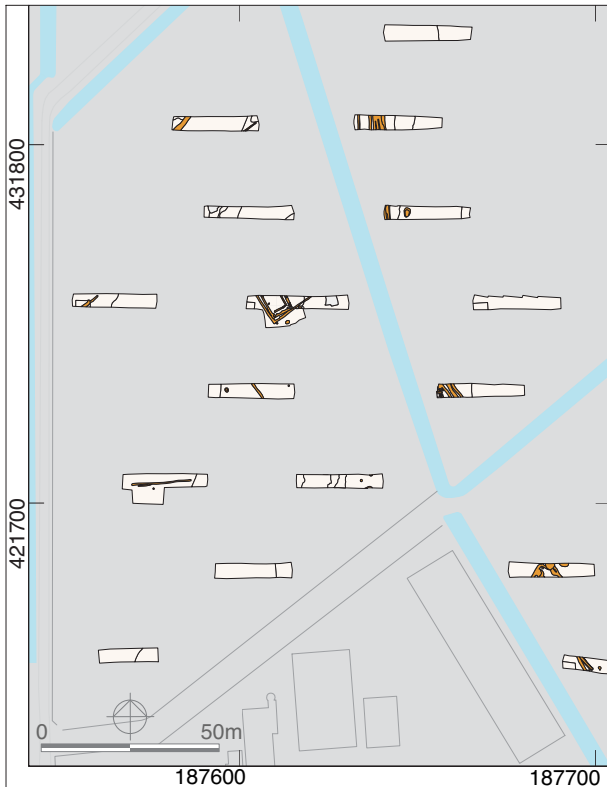


Fig. 6.2: Waalsprong area showing sand depth, sites (digit = RAAP inventory; letter = other) and excavation-trenches (blue; situation early 2008). Topographical situation c. 1995.

have been found at the edges of, and scattered around the contemporaneous settlements. They are virtually impossible to detect when coring. The extensive use of trial trenches to detect and between known settlements is mainly aimed at detecting these burial sites, and also the remains of infrastructure. The intensified trial trench programme thus gives us a better grip on the archaeology to be expected on and around sites, minimalising – usually costly – chance finds, but also allows well-advised selection and longer term financial planning.

From 1996 to 2008, some 19 ha of excavation trenches have been laid out (fig. 6.2), usually documented on two or more levels. An essential complementary strategy next to prospection, trial trenching and area-covering excavations is inspection of earth-moving in the areas between the sites, in order to discover features which escaped detection whilst coring and trial trenching, also here cemeteries being the most outstanding

examples. A special and fruitful branch of the inspections is the accompaniment of the large-scale clearing of ammunition, in this battlefield area of the last year of the Second World War, between the bridges of Arnhem and Nijmegen (esp. Operation Market Garden). Whereas the clearing implies the stripping of the plough layer on many lots, this represents an extra prospection before the start of the development works on the spot. This archaeological accompaniment even resulted in the discovery of what seems to be the first prehistoric stone paved track in the – stoneless – Holocene part of the Netherlands, stretching over some 200 m (site K in fig. 6.2). The pebbles and broken stones had been scattered by recent ploughing, together with pottery sherds primarily of Late Bronze Age/Early Iron Age date, but also from Roman and younger periods. All the same, the late prehistoric age of this track could be corroborated in adjacent trial trenches, at the bank of



a former residual channel. Here three undisturbed deposits of broken (cooking?) stones were found, one of these laid out to form a real path, leading to the water (fig. 6.4). At least two of these stone deposits can be dated to the transition from Bronze Age to Iron Age, in the 9th or 8th century B.C.



Fig. 6.3: Trial trenches at and around site 30. The trenches are laid out with intervals of 25 m at most, in order to cover even the smallest farmyard. The southern end of a rectangular structure from the Roman period is in one of the central trenches (J.-F. Gentenaar, BAMN).

Preliminary results

The aforementioned discovery of late prehistoric infrastructural features shows a major advantage of the study area – in contrast to the earlier investigations on the new railroad track in the adjacent area (Betuwe-route).⁷ This is the possibility to investigate the cultural landscape as a whole, encompassing contemporaneous settlements, cemeteries and ‘off-site’ features together, in relation to the natural environment.

A serious drawback, again compared with the Betuwe-route investigations, is the fact that until 2004 in the Waalsprong area only fieldwork was financed. Before the (provisional) implementation of the 1992 Malta Convention in legislation on a national level, analysis and publication were considered less compelling. This initial drawback, resulting in a series of excavations still to be published, is the reason why the outcome of 12 years of fieldwork presented here in a nutshell, roughly along the time-axis of habitation history, is to be considered as a preliminary result in most cases.⁸ The emphasis will be on features and insights that may be considered as archaeological novelties on a supra-regional level.

Prehistoric settlements and settlement rites

The excavations have indeed exposed the predicted settlements. But at the cluster of sites where the oldest, Late Mesolithic, remains have been detected, excavation is not needed or possible anymore within the Waalsprong project, as these sites have been protected by their new status as national archaeological monuments. The remains belong to hunter-gatherer camps dating to about 5500 B.C., situated along a wide channel (nos. 4–7, 23, 39–42).⁹ The next younger site (no. 22) dates from the middle of the fourth millennium B.C. People of the regional Middle Neolithic Hazendonk group with an extended broad-spectrum economy lived here on a sandy ridge in a swampy area (figs. 6.5 and 6.6). Despite this location, the faunal spectrum of these earliest farmers known in the eastern part of the Betuwe hardly contains wild animals. Cattle bones are predominant (Zeiler in Ball & van den Broeke 2007).

And although several dispersed finds indicate the presence of Bell Beaker and Barbed Wire Beaker Cultures in our study area, it is not before the Middle Bronze Age, the period of the Hilversum Culture, that we discern a continuous or almost continuous habitation until today.

In the southern and central Netherlands as a whole, the settlement system until the Roman period consisted principally of only single farms (fig. 6.7), with people and cattle under the same roof, in a dispersed pattern, or in hamlets of up to 4 farms.¹⁰ As the farmhouses

Fig. 6.4: Late prehistoric footpath of broken stones on the bank of a residual channel (R. Mols, BAMN).

Fig. 6.5: Section through site 22. In Middle Neolithic times the light sandy terrace relic in the background lay still exposed, but was gradually covered with clay. Long lasting interruptions during sedimentation resulted in grey vegetation layers (from Ball & van den Broeke 2007).



were scarcely rebuilt at the same spot, or only after several generations, this settlement system results in a sometimes confusing spread of house plans in excavations, the more as houses were not the only structures present at a farmyard, but were accompanied by outbuildings, fences and pits.

Concerning Bronze Age and Early Iron Age settlements in the Waalsprong area, until now we have found plenty of outbuildings and pits (fig. 6.8). Clearly discernible house plans from these periods are, however, still missing. But mentioning settlement features from the Late Bronze Age is on its own already surprising, since until shortly it was thought that during that period the whole Betuwe area was almost completely uninhabited, because of growing problems with water management (e.g. Louwe Kooijmans 1974).

The only pre-Roman house plan recovered until now dates from the 4th or 3rd century B.C. (Middle Iron Age), showing a central row of posts, and thereby making it a two-aisled building with a length of 13 m (fig. 6.9). A special feature of this house is a deposit in the most western central posthole, consisting primarily of pieces of burnt loam with traces of wattle work. This may be considered as a hearth collar, to keep the fireplace

safe, like the one from the famous site of Ezinge in the northern Netherlands (Boersma 1976, fig. 3). As the whole deposit (7.5 kg) was placed upon the base of a pot which stood at the bottom of the posthole, it may be interpreted as a closing deposit, the remains of a ritual performed at the abandoning of the house or the settlement as a whole. Another find of the same kind, being a load of 11 kg of Early Iron Age pottery sherds, most of them secondarily heated, in the southeastern posthole of the northernmost granary in figure 6.8, was the impetus to make an inventory of such deposits. It soon came out that it has been a recurrent feature of Late Bronze Age up to Late Iron Age settlements in the Netherlands (van den Broeke 2002c; see also Gerritsen 2003, par. 3.4).

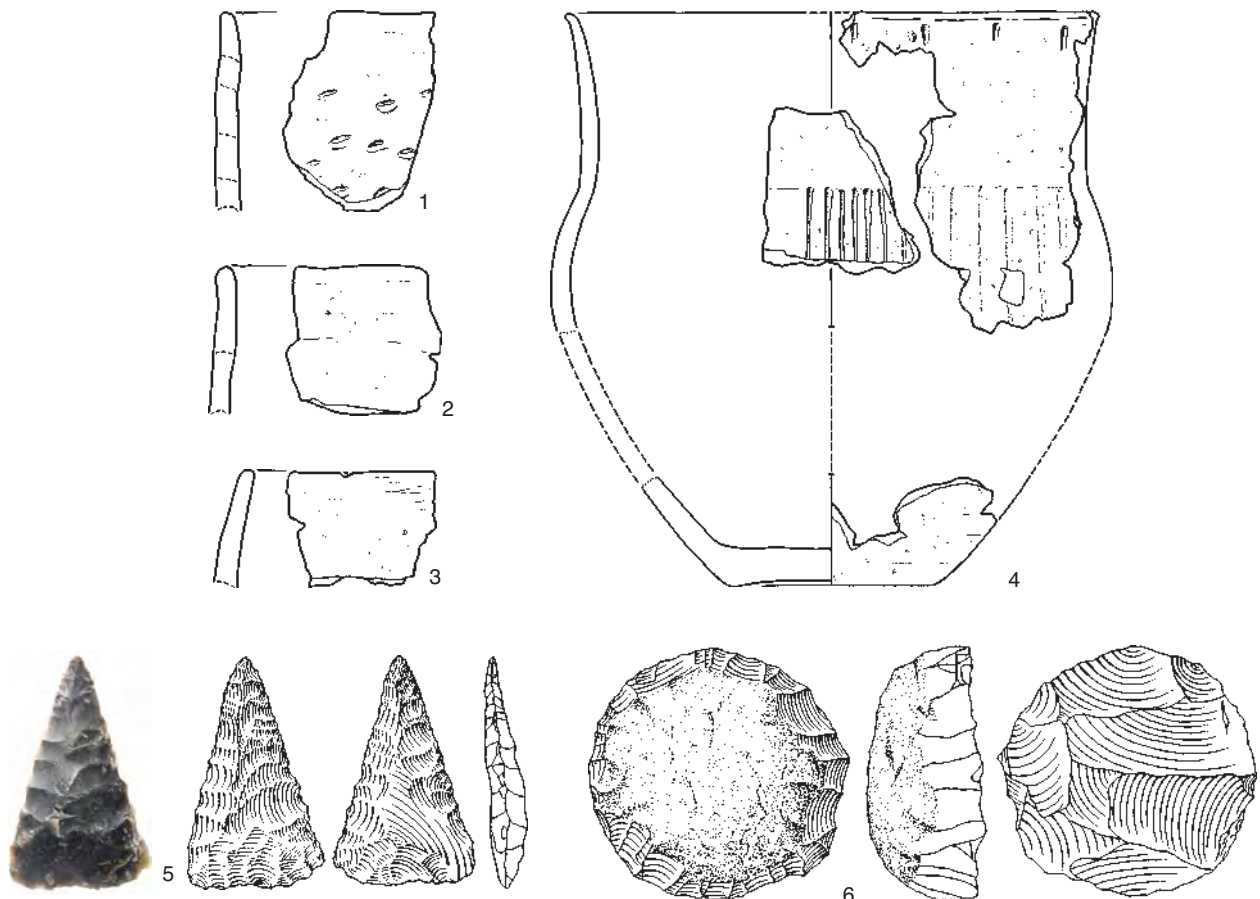


Fig. 6.6: Selection of Middle Neolithic artefacts (Hazendonk group) from site 22. 1–4: pottery (scale 1:3); 5: flint arrowhead; 6: scraper (scale 1:1). No. 4 is supposed to have a northern origin (from Ball & van den Broeke 2007).

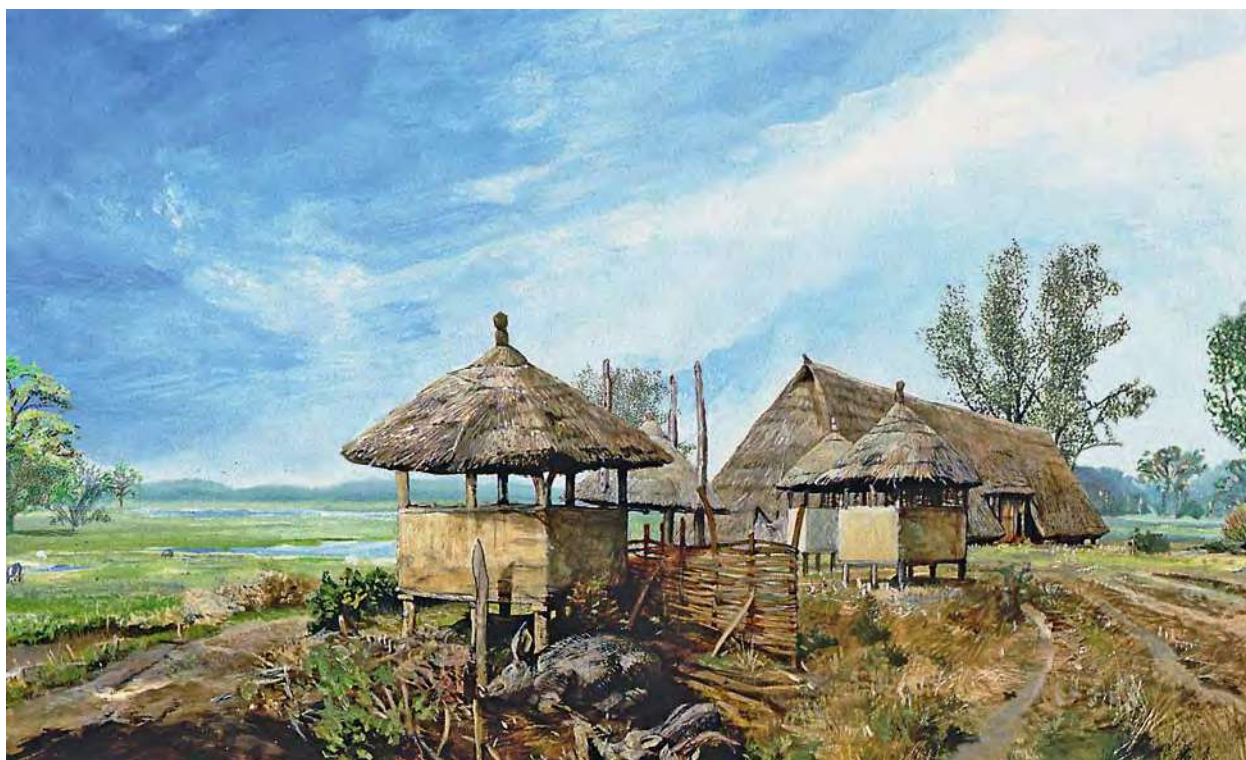


Fig. 6.7: Impression of an Iron Age farmyard in the river district. The inhabitants chose the higher parts in the landscape, like levees, for the farm, granaries and arable land. The adjacent backswamp was particularly suited for pasturing (Kelvin Wilson).

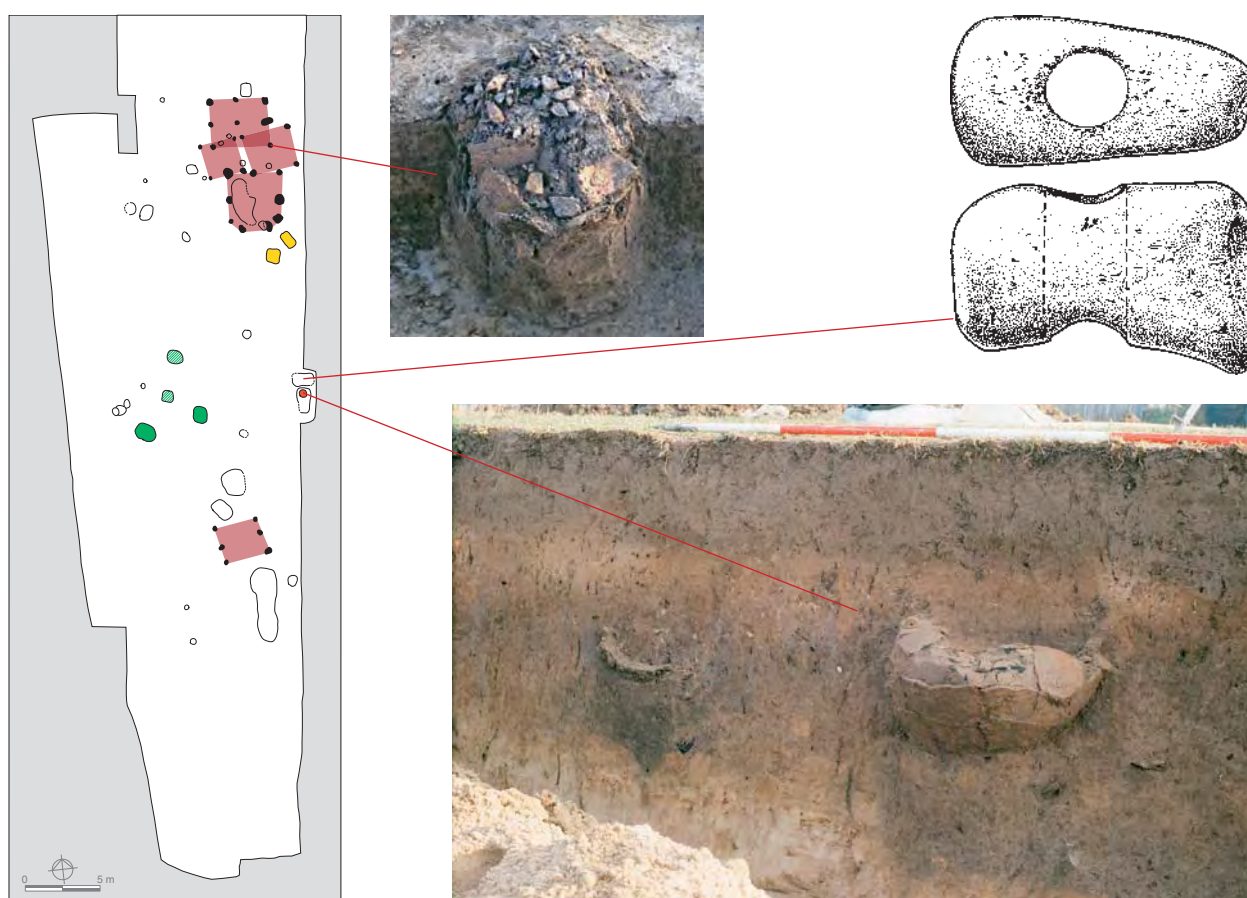


Fig. 6.8: Early Iron Age granaries and pits from the Middle Bronze Age (yellow), Late Bronze Age (green) and Early Iron Age (white) at site 56. Several of these pits seem to have served as storage pits. Some outstanding features and finds are a posthole filled with 11 kg of pottery sherds, an antler hammer (scale 1:2) and a (decapitated) storage jar (drawings R. Mols & A. Simons; photo R. Loeffen, BAMN).

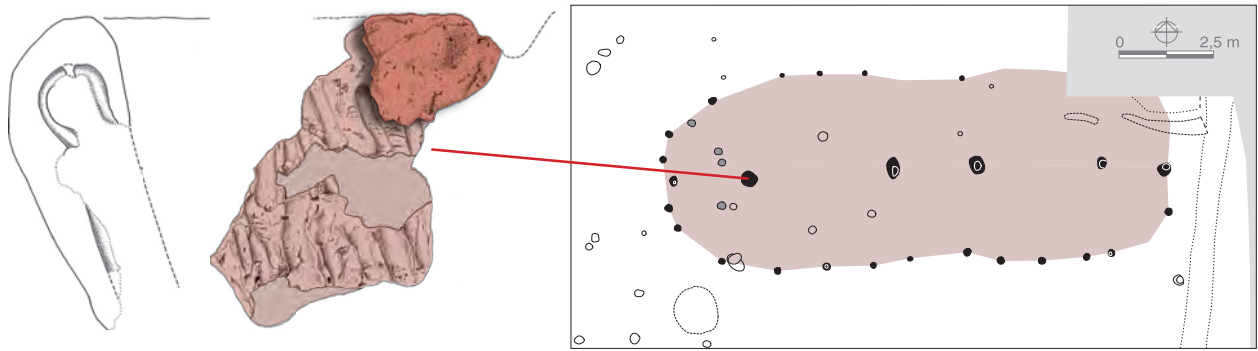


Fig. 6.9: Middle Iron Age house plan from site 8 (right). Scale 1:200. Some of the 7.5 kg of burnt loam pieces with wattle-work impressions from the western central posthole suggest a hearth-collar (left). Scale 1:4 (drawing R. Mols & A. Simons, BAMN).

Prehistoric burial monuments and rituals

The Middle Bronze Age burial model for the central and southern Netherlands differs from later ones by the presence of single barrows, with either inhumation or cremation burials, but sites with clustered mounds are also known. A complex of barrows on stone platforms on the Kops Plateau, on the verge of the ice-pushed ridge in Nijmegen, may be mentioned as one of the most outstanding examples of this clustering (Fontijn & Cuijpers 1998/99). From about the 11th century B.C. urn-fields are standard in the whole of the Netherlands, and from about 400 B.C. less conspicuous, mainly smaller cemeteries with cremation graves are the most common form of disposal of the dead in the southern and central Netherlands.

The Waalsprong area only partly meets this standard. Relatively normal is a small cemetery containing cremation graves that has been recovered at only 150 m distance from the roughly contemporaneous house depicted in figure 6.9. The largest ring ditch, measuring some 13 m in diameter surrounded two grave-pits (fig. 6.10). But although this small cemetery is the youngest one in a series of cemeteries, spanning a millennium, it is the first one to date with peripheral structures. The graves from the Middle Bronze Age until the end of the Middle Iron Age are disappointingly simple monuments, just grave pits, without any sign of a barrow covering them. That this is not a result of recent levelling is corroborated by the fact that at least three native Roman farmyards in the Waalsprong area have been found to cover earlier graves, sometimes the farmhouse itself covering the grave (fig. 6.10). Given the absence of recognisable mounds, and realising that it is virtually impossible to detect cemeteries by coring, it is not surprising that the ten late prehistoric cemeteries that have been investigated until now (fig. 6.11) were all discovered during the trial trench programme, settlement-excavation and by inspection of earth-moving. The oldest flat graves contained the skeletons of two men and probably a woman, two of which have been

¹⁴C-dated to the Middle Bronze Age (site 34).¹¹ At least one man has been buried face downwards, a still unexplained trait that was repeated in later periods (see below).

Like in the rest of northwestern and central Europe, burying cremated remains with or without an urn was the standard practice for the disposal of the dead in the Late Bronze Age (fig. 6.12). In case of the Waalsprong area this resulted in urnfields of modest dimensions, with some dozens of pits as a maximum. Cremation as the standard practice was continued in the Netherlands for many centuries, but in this respect our study region is an anomaly, even on a supra-national scale. All cemeteries dating from the Early Iron Age and the beginning of the Middle Iron Age have at least some inhumation graves next to the cremation graves. As a result it can be stated that in the Waalsprong area more Iron Age skeletons have been found than in all the rest of the Netherlands together (cf. van den Broeke & Hensing 2005). Beside this, for the first time some knowledge of Iron Age head decoration has been acquired in the Netherlands.

In the most remarkable cemetery (site B), 15 Early Iron Age inhumation graves lay intermingled with 17 cremation graves (fig. 6.13). Among the inhumed persons was a 25 to 40 year old woman who had been buried face downwards, with a bronze spiral-ring on both sides of the skull (figs. 6.13 [bottom] and 6.14). Similar ornaments, together with a smaller bronze ring, accompanied the woman in a double grave, who had been laid stretched on her back, after a man of about the same age (25–35) had been buried more or less face down-

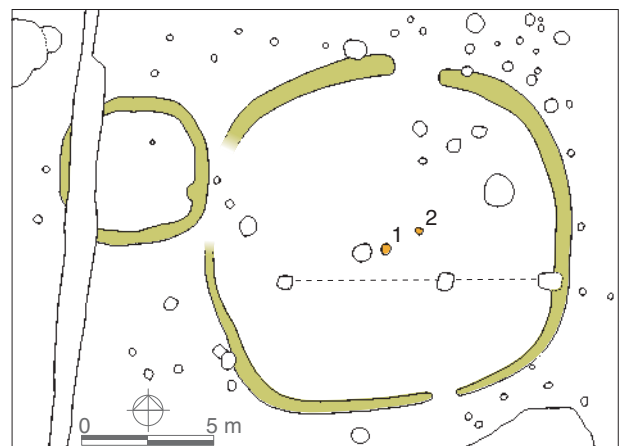
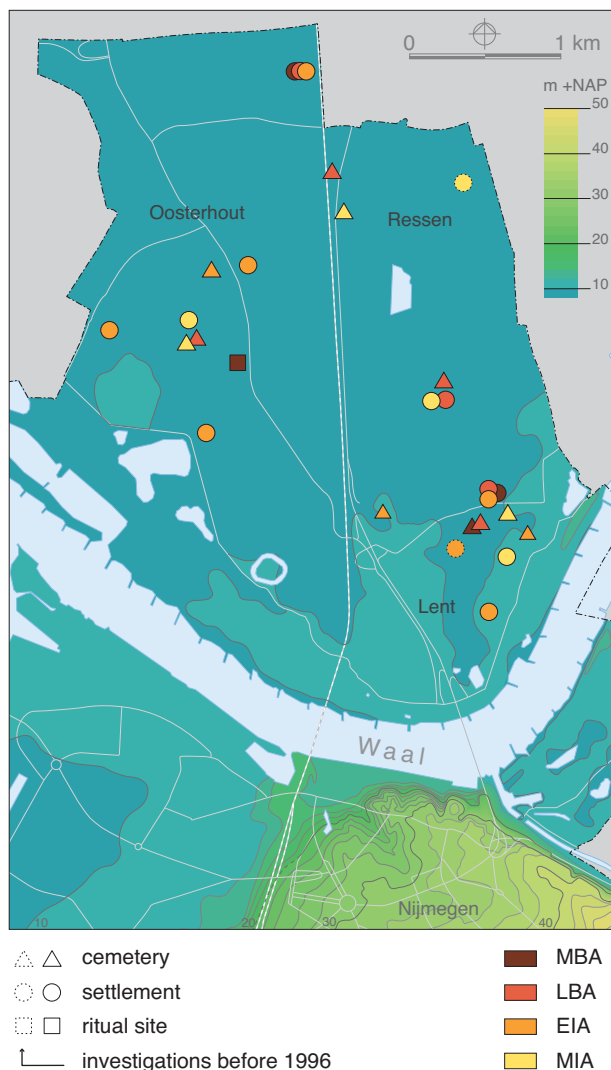


Fig. 6.10: Largest Middle Iron Age grave structure at site 8 and smaller ring ditch. Around the beginning of our era the grave has been built over. Only the central row of posts of the two-aisled house has remained, which is the case for several other houses in the settlement during the Roman period (from van den Broeke 2006).



wards (figs. 6.13 [top] and 6.15). Several of these smaller rings were found on the skull of a woman in an Early Iron Age cemetery at site 67.

It is very tempting to consider the interred people as immigrants, like the contemporaneous ladies of Petershagen-Ilse in Westphalia (Bérenger 2000). The spiral-rings would plead for an origin in the Middle-Rhine area in that case (cf. Heynowski 1992, 80–81). But that leaves



Fig. 6.11: Distribution of sites from the Middle Bronze Age to the Middle Iron Age as known by excavations (R. Mols, BAMN).

us with the question why these people have been interred in a cemetery containing an equal number of cremation graves with some local pottery. And why are inhumation graves present in all the local cemeteries for about two to three centuries?

The successor of the former cemetery may be the one that was discovered at a distance of only 250 m, and dating from about the (6th–)5th century B.C. (site 34; fig. 6.16). The graves were in an area where, about a century earlier, granaries had been standing, and where afterwards, in the Roman period, ditches were dug. One of these graves again is in fact a double grave, in this case the upper deceased lying face downwards, with her or his left arm lying flexed on the neck.¹² The discovery of the lower skeleton, across the former one, and belonging to a man of 40 to 60 years old, was completely unexpected. His skull shows some bronze ornaments in a way that is still unparalleled, but explicit enough to have his appearance illustrated (figs. 6.17 and 6.18). Apart from two plait-rings he wore an earring, that may even have been rolled in his auricle.

In this same period, the beginning of the Middle Iron Age, elsewhere in the southern half of the Netherlands a small number of cemeteries have been laid out with a mixture of inhumation and cremation graves (van den Broeke & Hessing 2005, with references). In these cases, however, the inhumation ritual may reflect the strong northern French influence of that time, which is manifest already from the grave goods, especially in grave 1 in Geldermalsen (Hulst 1999). In the case of lower Nijmegen, we may, on the other hand, point at the still unique local predecessors dating from the Early Iron Age.

Ritual deposition out in the open

Mentioning settlements and burial grounds is surely not enough to characterise the main features of Bronze and Iron Age habitation in the southern Netherlands. The landscape outside the settlement area is emphasised as the focus for the deposition of bronze objects, especially the watery parts of it (Fontijn 2003). Concerning this theme, lower Nijmegen has even more to offer than the average site with votive deposits, as a Middle Bronze Age ritual site with structures has been found here (site 27). At first the site presented itself as a dark layer, consisting almost exclusively of charcoal, burnt clay and broken stones (fig. 6.19). There were hardly any sherds or bone fragments present. This dark layer sloped down to a residual channel which in the Bronze Age had a width of about 30 m, at least in the wet seasons. Below the dark layer two ring structures appeared, ditches in which the walls of huts or screens would have been placed (fig. 6.20). Moreover there were some remarkable finds: at the slope of the channel, below the dark layer, lay a small bronze dagger, dating from the 16th century B.C. At the bottom of the channel an almost unused quern was found. Although we are rather familiar with bronze deposits, querns

Fig. 6.12: Late Bronze Age urn at site 8 (W. Doodeheefver, BAMN).

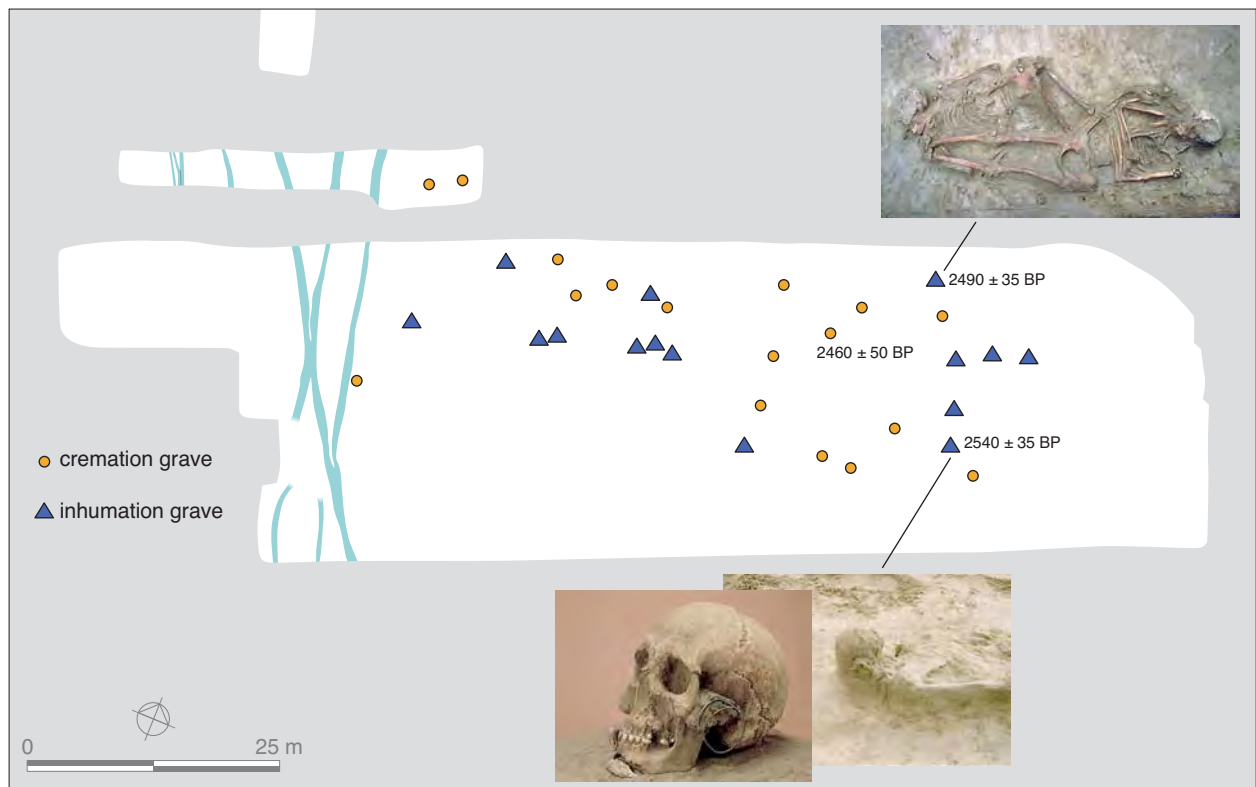


Fig. 6.13: Early Iron Age cemetery at Lent-Steltsestraat (site B). ^{14}C -dates from cremated bone (1 x) and uncremated bone (2 x) (drawing and photos R. Mols, BAMN; photo right lower corner C. Ginnap, BAMN).

may not be underestimated in this respect, as several of them have been found in the most prominent ritual landscapes of the Netherlands, being the brook valleys and peat-bogs of Drenthe (van der Sanden 1998), not to mention the 4 specimens from the well-known Eng-

lish Bronze Age ritual site of Flag Fen (Buckley & Ingle 2001).

Even without some other features, like a rectangular pit with a pavement of burnt clay cobbles and a probably water-filled pit, this site is unprecedented in the north-

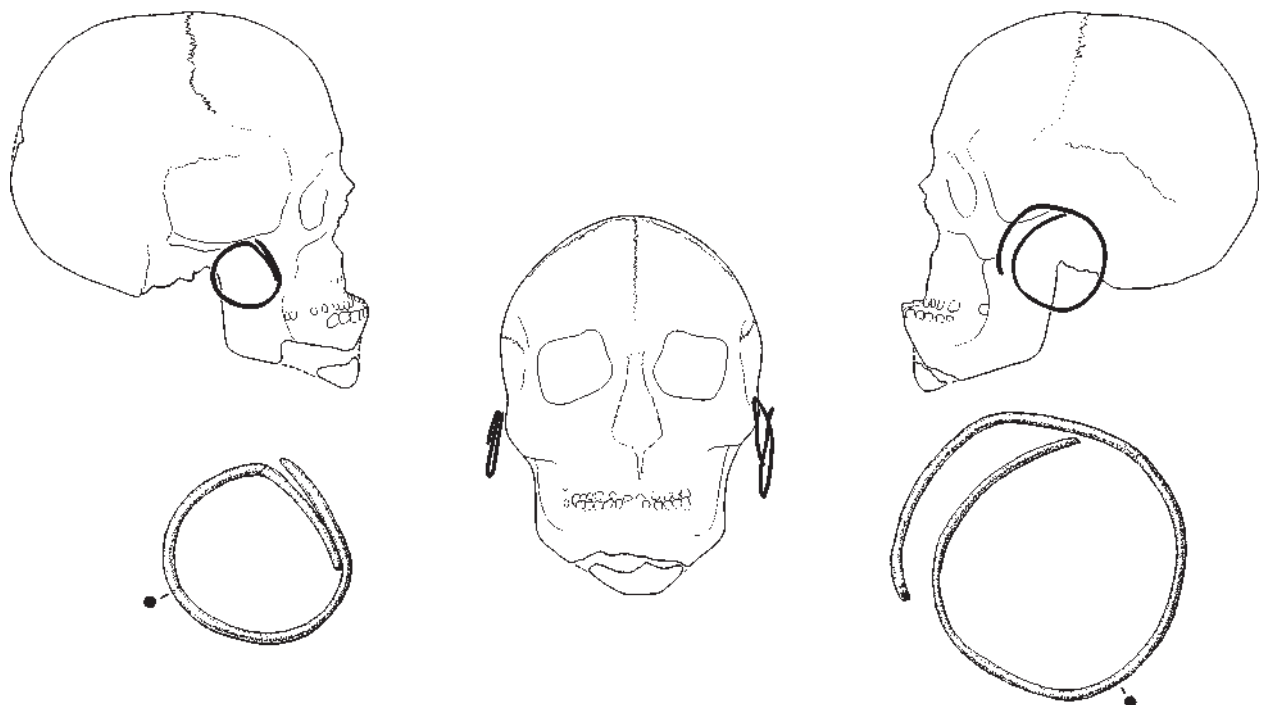


Fig. 6.14: Early Iron Age woman from one of the graves at site B with spiral-rings on both sides of the head. Ornaments scale 2:3 (A. Simons, BAMN).

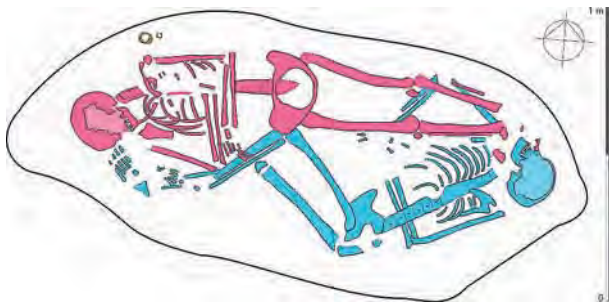


Fig. 6.15: Burial at site B of a man and a woman aged 25–35, measuring 1.65 m and 1.55 m respectively. The woman (red) was accompanied by three ornaments of twisted bronze wire, placed near the left shoulder (A. Simons, BAMN).

western part of the continent. However, it resembles much of what is known in Great Britain and Scandinavia as ‘burnt mounds’, be it in Dutch dimensions (rather flat), when compared with Richard Bradley’s recent description of this type of site: “... these are simply mounds of fire-cracked stones, although excavated examples are usually associated with a trough and sometimes with a small building. They are normally found beside streams and seem to result from a specific technology in which heated stones were employed to boil large amounts of water. (...) It seems more likely that the main objective was to create large amounts of steam, so that they may have been used like North American sweat lodges.” (Bradley 2007, 214–215).

But also less conspicuous locations with one or more votive deposits have been traced, like the one at 2 km east of the cult place, adjacent to an early Late Bronze Age urnfield and some settlement traces (site 32).¹³ Here a very wide – but then partly filled-up – residual channel was the focus of rituals in the Late Bronze Age,

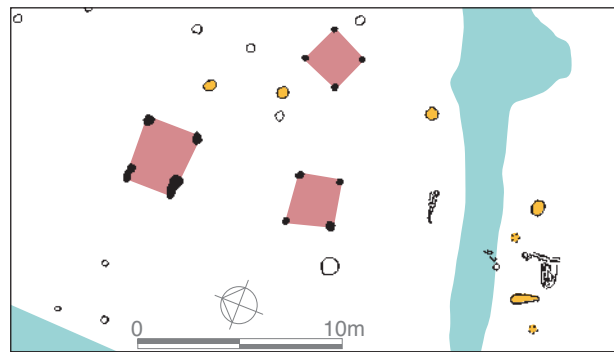
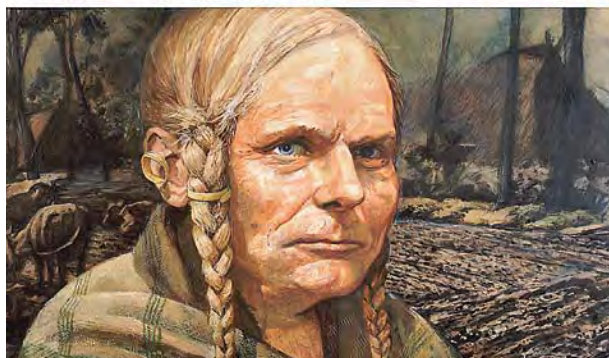


Fig. 6.16: Small (Early–)Middle Iron Age cemetery at Lent-Laauwikstraat (site 34) with cremation graves (orange) and inhumation graves among the features of older granaries. In the Roman period one of the skeletons has been disturbed when a ditch (blue) was dug. Scale 1:400 (R. Mols, BAMN).

probably continuing into the Early Iron Age. The most prominent bronze finds are two spearheads as well as a disc-headed pin (fig. 6.21).¹⁴ The impression that we are dealing here with votive deposits is still increased by another find from this same location. In a pit lay parts of two cattle skulls, the horns still attached (fig. 6.21, bottom left). This find fits perfectly into a tradition of Neolithic and younger cattle-horn depositions, that we know very well from the peat-bogs and brook valleys of the province of Drenthe (Prummel & van der Sanden 1995). But what makes this find an extraordinary one is the stone (28 kg) that crowned the pit fill, because the Betuwe is devoid of stones of even less than 1 kg. In the 1st century A.D., when the wide residual channel had silted up and another channel had broken through its fill, there again a ritual deposition seems to have occurred (fig. 6.22), at some 200 m west of a farmhouse of that same age at site 32. Seven *aurei*, the youngest one dating from the year A.D. 74, will have been the content of a purse. And although the whole river-bank had been used as a rubbish dump and must have been dry in the summer season, it would be too easy to do out this treasure find as the result of loss or of hiding property, since at a distance of no more than 3 m a silver Celtic coin of the Scheers 57 type was found in the same stratigraphic position (= Heinrichs 2005, 215, 2.2.11). This observation at the same time indicates that it had been deposited about a century after its minting.

Native Roman habitation

Having pointed at the coin deposit dating from the 1st century A.D., who may we hold responsible for it? Concluding from Tacitus’ *Germania* and *Historiae*, it was after the Gallic War, but before the beginning of the 1st century A.D. that the Dutch eastern rivers area was populated by the *Batavi*, who would have split from the tribe of the *Chatti* in Hesse. Apparently they settled in an uninhabited part of this area. This influx of immi-

Fig. 6.17: Skull of the man in the double grave at site 34, with two of the bronze ornaments in their original position and artist’s impression of this Middle Iron Age man (photo R. Mols, BAMN; drawing Kelvin Wilson).

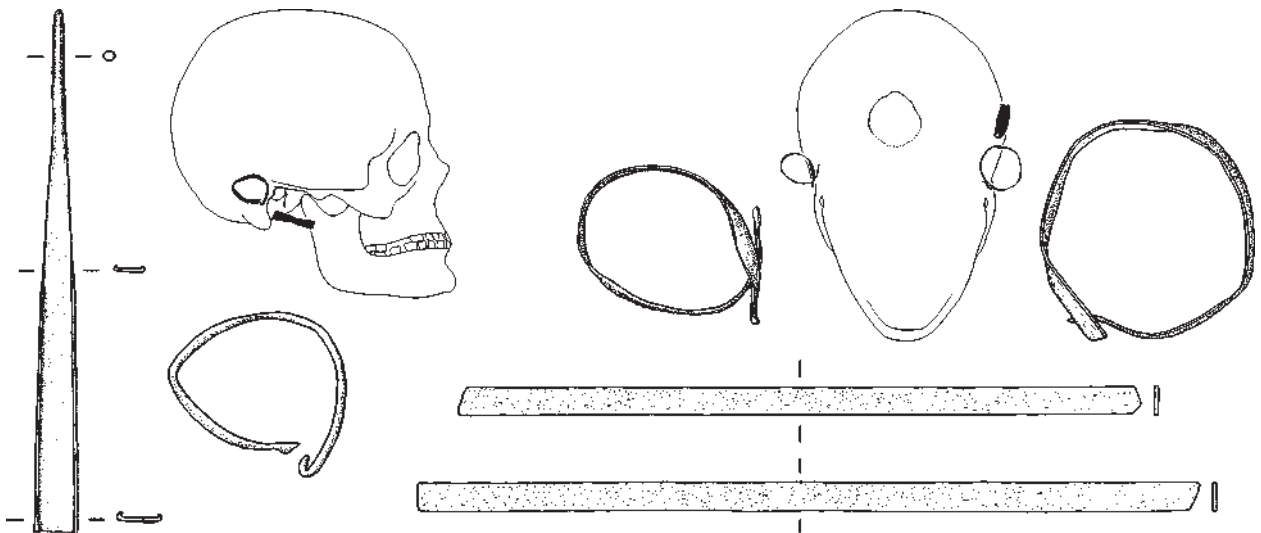


Fig. 6.18: Head ornaments from the man in the double grave (site 34): bronze earring and two plait-rings. Ornaments scale 1:1 (A. Simons, BAMN).

grants has been dated by Roymans between 50 and 40 B.C., on the basis of *triquetrum* coins of silver and silver alloys, most of which have been found in this same area and which are considered to be Batavian emissions (Roymans 2001 and 2004, 67–101).

But despite the drastic action of Caesarian troops during the Gallic War in the southern Netherlands, this area was not empty when these Batavians intruded. In lower Nijmegen alone there are at least 4 native-Roman settlements where Late Iron Age Nauheim-brooches are present as well. But taking into account the probable pre-Caesarian date of the Nauheim-

brooches, glass La Tène bracelets (fig. 6.23) seem to be more reliable indicators of a persistent autochthonous population in these settlements. In the Early Roman period the form and colour spectrum of the bracelets still resembles the pre-Roman spectrum of the Lower-Rhine area (see also Van den Broeke 2001, 138–139). In that rather small region more than 3000 glass bracelet finds in total have been registered, no doubt for the greater part stemming from a regional production (Roymans 2004, 16; see also Seidel 2005, 15). Consequently, it looks as if the immigrants from Hesse – possibly a small elite-group – have mixed with the local

Fig. 6.19: The 30 cm-thick layer of charcoal, burnt loam and broken stones dominating the Middle Bronze Age site 27 (Oosterhout-Rustwat) (BAMN).



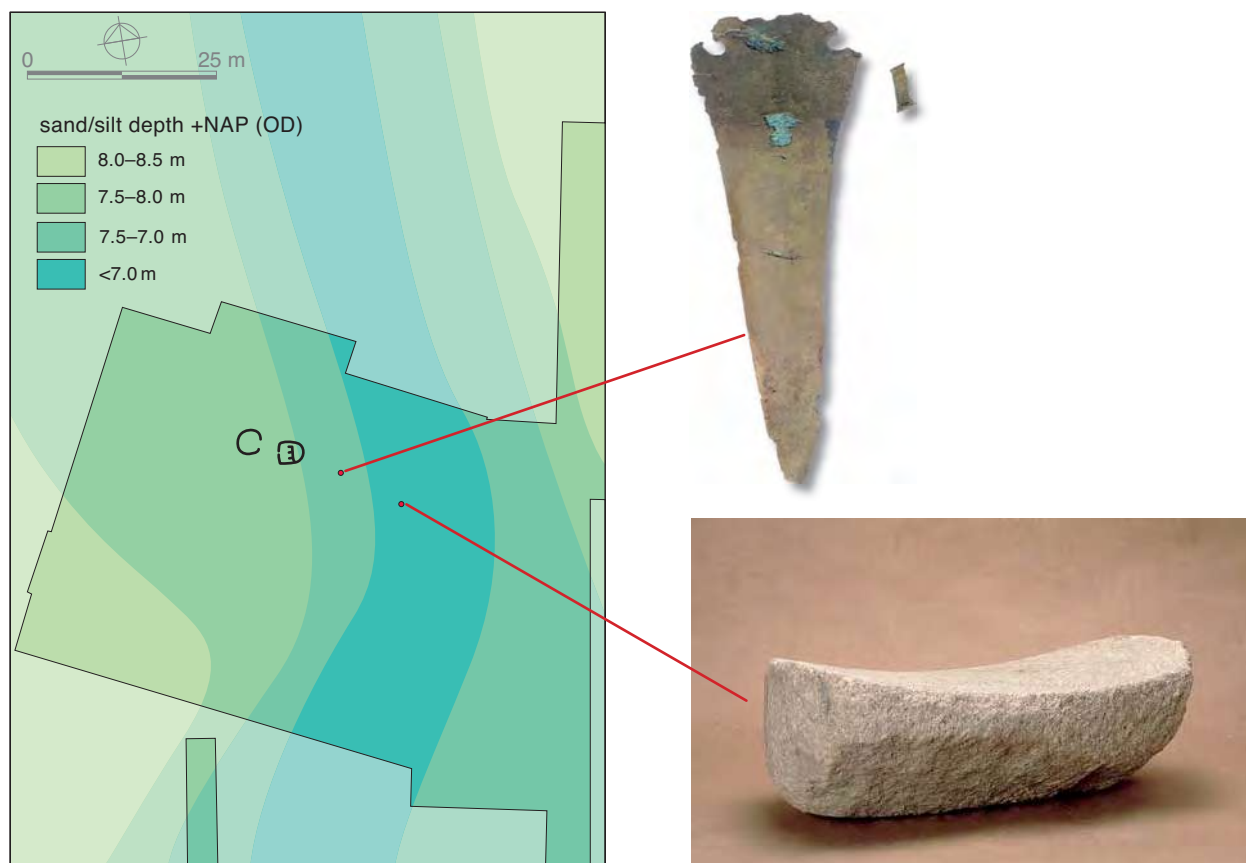


Fig. 6.20: Site 27. Small Middle Bronze Age structures next to a residual channel, with two votive deposits: a bronze dagger with rivet (scale 2:3) and a stone quern (R. Mols, BAMN).

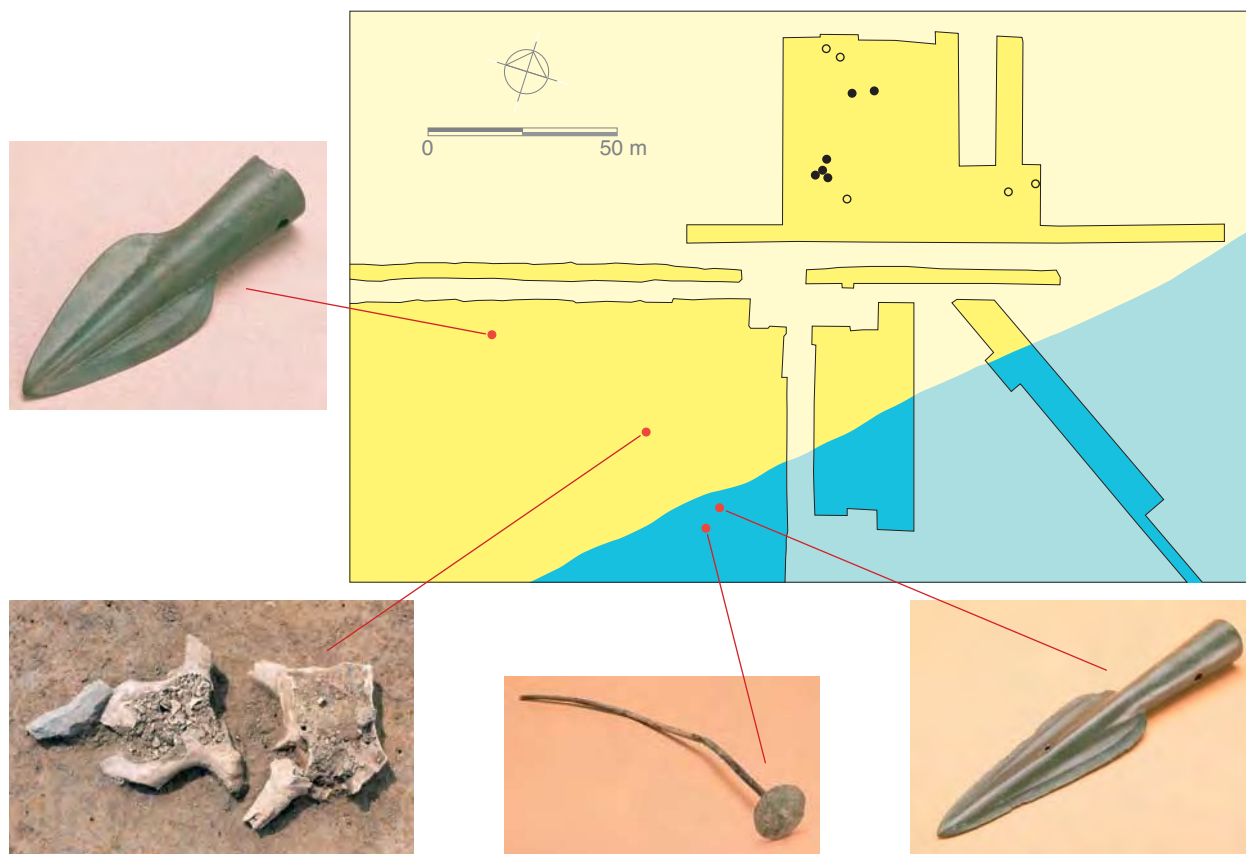


Fig. 6.21: Supposed votive deposits in the vicinity and in the fill of a then partly filled-up residual channel at site 32 (Lent-Smitjesland). North of it lies an early Late Bronze Age urnfield with cremation graves (open circle: without urn; closed circle: with urn) (R. Mols, BAMN).



Fig. 6.22: Silver Celtic coin, found in a residual channel close to a hoard of 7 aurei from the 1st century A.D. at site 33 (Lent-Smitjesland). Scale 3:2 (R. Mols, BAMN).

population, the mix continuing its existence under the name *Batavi* (cf. Roymans 2004, 55–101). What did the rural habitation look like, so close to the Roman town and strongholds of Nijmegen? At the start of the project we knew only the plan of a building with entrenched stone piles, in the village of Lent, measuring 26 m × 9.5 metres, dated between A.D. 70 and 150 (van Es & Hulst 1991, 61–65).¹⁵ It may have been part of a *vicus* or a *villa* complex, its presence also indicated by significant amounts of stone building material from later small-scale excavations in the village of Lent (van den Broeke & den Braven 2009). The dozens of house plans that have been documented since 1996 in lower Nijmegen are, however, without exception of the traditional native type, built of wood and other organic materials (fig. 6.24). The majority of the houses were two-aisled houses-cum-byre, up to 36 m long.

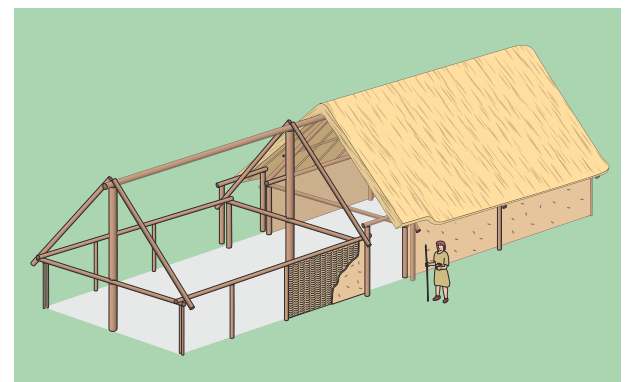
Fig. 6.24: Model of a native Roman farmhouse on basis of a 19 m-long houseplan from site 8 (R. Mols, BAMN).



Fig. 6.23: Glass bracelet fragments from the Late Iron Age and Early Roman Period found at sites 8 and 9/57. Scale 1:1 (R. Mols, BAMN).

A rather strong variety existed in the lay-out of the native Roman rural settlements, although they never exceed the size of a hamlet. A single farmhouse with outbuildings appears to have been the most elementary type. The other side of the range shows an elongated settlement with ditches and a palisade, covering 4.5 ha (fig. 6.25). A small cemetery was laid out next to the southwestern part of this settlement at site 8. The elongated shape resulted from a slight elevation in the former landscape, which would have facilitated the habitability of the settlement. Most ditches and soak-aways had the same purpose.

This site was already inhabited on a modest scale in the Middle Iron Age (see above), and it may have been continuously inhabited until the Roman period, but all the structures depicted in figure 6.25 are from this latter period, until the middle of the 3rd century. The two largest farmhouses actually date back to the decades around



the start of our era. One of these is in the northern part of the settlement, which was laid out as a separate residential area.

Despite the number of main buildings and larger outbuildings in the settlement as a whole, considering the wooden constructions, there will never have existed more than 5 or 6 farmhouses at a time. For the provision of water, wells were dug in various places in the

Fig. 6.25: Provisional plan of the native Roman settlement at Oosterhout-Van Boetelaerstraat (site 8), combining the larger constructions from all phases. Yellow lines indicate the level of sand in the subsurface, ranging from 7.00 to 8.50 m + NAP (OD) with intervals of 0.25 m (R. Mols, BAMN).



settlement. For their lining either wattle-work, planks or an occasional Roman wine-barrel was used.

An initial analysis of the bone material indicates that cattle dominated the livestock (Whittaker 2002). However, the role of horses, some complete skeletons of which were found in the settlement, should not be underestimated, as the Batavians were famous for their cavalry in Roman military service.

It is surprising to see how the inhabitants stuck to the ancestral building traditions, whereas they dressed increasingly in accordance to the Roman fashions and surrounded themselves with objects originally alien to their indigenous culture (fig. 6.26). Roman hairpins, signet rings, spatulas, mirrors and perfume bottles are common finds from this rural settlement. It is easy to conclude that on the other side of the river Waal there were plenty of possibilities to exchange the produce of the land and livestock against these goods. But a significant role in the acquiring of luxury goods, as well as in the process of Romanisation as such, should be ascribed to the many Batavians who were serving the Roman army in the auxiliary troops, and even in the bodyguard of the Roman emperor.¹⁶

The first indications of the presence of Batavian soldiers in the settlement are the dozens of metal harness decorations (Nicolay 2001 and 2007, site 222). Several of

Fig. 6.26: Fragment of a panflute (height 14.4 cm) found in a well from the 2nd century A.D. at site 8. A red deer with antlers has been carefully carved after the production of the instrument (R. Mols, BAMN).

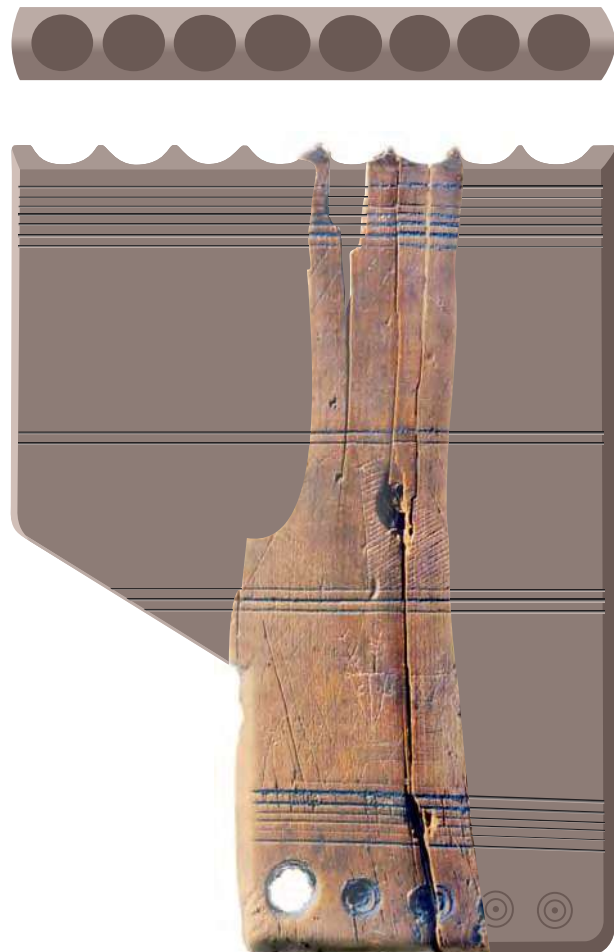




Fig. 6.27: Rich cremation grave in native Roman cemetery at site H (Oosterhout-Rustwat). Apart from 8 pottery vessels it contained a worn Roman coin, a convex glass mirror (carved from a glass container) with remains of lead, lathe-shaped bone ornaments, three bone (hair-)pins, a pair of bronze fibulae, a silver ring with inscription VIC and a necklace with several gold-in-glass beads (W. Doodeheefver, BAMN).

these are doubtless militaria. The undamaged *gladius* that was part of a ritual deposit in the entrance of the northern subsidiary settlement is another illustration. Particularly the veterans who had returned to their home village may be deemed responsible for examples of intensive Romanisation in this hamlet. Wooden writing tablets (van den Broeke 2009b) and lids of seal boxes support the idea that there was reading and writing among the rural population in the Batavian area, undoubtedly in Latin – as tell the Batavian letters found in *Vindolanda*, along Hadrian's Wall (Derks & Roymans 2002).

At least one Batavian veteran appears to have been buried in the cemetery next to the settlement. *CANDIDUS* will have survived the Roman army, taking with him his *terra sigillata* plate with inscription *CANDIDI* when returning home, and was still accompanied by this souvenir in his cremation grave.

A second native Roman cemetery, containing some 100 cremation graves as well as a few inhumation graves, has been found 500 m eastward (site H). It probably

belongs to a different settlement. It reflects the Roman way of life even more; with rather elaborate pottery services (fig. 6.27), a bronze candlestick, an iron *strigilis* and small glass mirrors, to mention some examples.



Fig. 6.28: Silver fibula (l. 2.6 cm) from cremation grave at site H (R. Mols, BAMN).



Fig. 6.29: Terracotta figurines of Cybele and lions from site 8 (R. Mols, BAMN).

The fibula of apparently Pannonian origin (fig. 6.28) in a cremation grave may be considered as another military souvenir, as Batavian troops are known to have served in Pannonia and Dacia.

Those having survived service in the Roman army for 25 years will not have been reluctant to stick to the Roman pantheon as well. The statuettes of Cybele and her fixed companions (fig. 6.29) that were found close to each other in settlement ditches indicate that this is not a portrayal of an indigenous goddess in Roman guise, but that the settlement had convicted Cybele worshippers.

The number of settlements in the Waalsprong area clearly decreases in the 3rd century, entirely in line with the general decrease in the habitation of Germania inferior in that period. But recent finds from the village of Lent (fig. 6.30) propose a different scenario for that place. It seems that in the aftermath of the Roman oc-

cupation, habitation here was continued to the present day without any significant gaps, possibly even with early and late Merovingian elite presence (see esp. Ball & Meijers 2009; van Es & Hulst 1991). It also means that the habitation history of Lent increasingly turns out to run parallel to that of Nijmegen.

Conclusion and prospects

Twelve years of investigations in lower Nijmegen have, among other things, given insight into the changing native lifestyle on the fringes of the Roman empire, close to the Roman town and strongholds at the other side of the river.

The Middle Bronze Age burnt 'mound' along a residual channel opens our eyes to the diversity of late prehistoric ritual sites in this part of the continent, where, considering structures, until now only the famous wooden structure of Barger-Oosterveld in the peat bogs of Drenthe was known (lastly van der Sanden 2000).

The stone infrastructural 'works' from the 9th/8th century B.C. still ask for an explanation, as they do not have counterparts in the Netherlands until now. In case of the pavement (site K) there may be a link with the square or almost square stone ritual site in its continuation, on the other side of the Waal, on the Kops Plateau.

Fig. 6.30: Selection of Late Roman and Merovingian metal (settlement) finds from the village of Lent. 1: bronze hair-pin; 2: bronze *Stützarm*-brooch; 3: fragment of silver-gilt pin; 4: bronze belt-fitting; 5: bronze strap-end; 6: bronze tweezers; 7: gold/almandine sword scabbard mouthpiece; 8: bronze/enamel bird-shaped brooch; 9: bronze disc. Nos. 1 and 9: scale 2:3; nos. 2–8: scale 1:1 (R. Mols, BAMN).



It was constructed in roughly the same period (Fontijn & Cuijpers 1998/99, 55–60).

In case of the Early Iron Age inhumation graves, migration might be involved, a question which may be answered by today's possibilities of DNA and isotopic research, for which samples have recently been submitted.

Notes

- ¹ See Willems & van Enckevort 2009 for an overview of the Roman history of Nijmegen.
- ² Literally: jump across the river Waal.
- ³ After the Batavian Revolt of A.D. 69/70, during which Oppidum Batavorum, which had grown into a small town, was burnt down, a new town was built 2 km further west. From about A.D. 100 this town was called *Ulpia Noviomagus (Municipium) Batavorum*. In the Late Roman period the habitation centre was again on the Valkhof plateau.
- ⁴ The Late Merovingian cemetery of Lent-Azaleastraat being the outstanding archaeological site here (van Es & Hulst 1991).
- ⁵ *Bureau Archeologie*, since 2007 part of *Bureau Archeologie en Monumenten*.
- ⁶ The archaeological investigations are financed by the municipality of Nijmegen in combination with the external developing company, Grond Exploitatie Maatschappij Waalsprong.
- ⁷ Site reports have been published in the *Rapportage Archeologische Monumentenzorg* series of the National Service for Archaeological Heritage (ROB), now part of the National Service for Archaeology, Cultural Landscape and Built Heritage (RACM). One of the settlement sites in our study area (site 2 in fig. 6.2) has been partly investigated within the framework of the Betuweroute excavation programme (Krist 2001). A Late Bronze Age urnfield (site G in fig. 6.2) was newly detected when construction works were under way (van den Broeke 2003a).
- ⁸ Before 2004 only some minor investigations, financed by external parties, have been published in the *Rapporten* series of the *Nijmeegse Archeologische Berichten* (van den Broeke 2002b and 2003a). Regularly financed reports (again concerning partly investigated sites) are Ball & van den Broeke 2007 and van den Broeke 2008a/b. For preliminary results concerning several sites see van den Broeke 1999, 2001, 2002a/c, 2003b, 2005a/b, 2006, 2009a, van den Broeke & Hessing 2005 and van den Broeke et al. 2006, as well as Ball & Meijers 2009, van den Broeke 2009b and Nicolay 2007 for publications of selected artifacts.
- ⁹ The results of an inevitable excavation preceding the entrenching of a pressure pipe have been published in van den Broeke 2002b.
- ¹⁰ See Louwe Kooijmans et al. 2005 for general patterns, as well as Arnoldussen 2008 for a more recent overview concerning the Bronze Age.
- ¹¹ 3050 ± 45 BP (GrA-22860) and 3080 ± 50 BP (GrA-22971).
- ¹² A ¹⁴C-date of 2350 ± 50 BP (GrA-11992) has been acquired for this skeleton.
- ¹³ See van den Broeke 2001, 135–136 for some urns and ¹⁴C-dates.
- ¹⁴ See Butler & Steegstra 2007/2008, fig. 9c for a Late Bronze Age necklace spacer from the same zone.
- ¹⁵ Here we leave aside the 'swarm' of postholes at Ressen-De Woerd (site 18; Braat 1949), which may for the greater part even date from the Middle Iron Age (van den Broeke 2007).
- ¹⁶ See Willems 1986, 389–390, for the whereabouts of the Batavian soldiers.

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7 | The Ottonian margravian centre of Ename: from large-scale excavations to international regulations

Dirk Callebaut and Koen De Groot

Abstract: The large-scale excavations at the medieval site of Ename were part of the study of occupation and defence in the valley of the Scheldt, which was started by the former National Service for Excavations (now: the Flemish Heritage Institute – VIOE). The integration of the excavations in a broad study of the archaeological, monumental and environmental heritage and the relationship of the data with an innovative public outreach scheme were crucial. The various international recognitions that the project received highlight the need for the continuation of thematically focused excavations, to complement the rescue archaeology that dominates the field of action in many European countries today.

1. Context of the investigation

The excavations in Ename by the Flemish Heritage Institute (the former National Service for Excavations, from 1989 onwards the Institute for the Archaeological Patrimony) constitute the focal point in the large-scale thematic investigation into early medieval habitation and fortifications in the valley of the Scheldt. This area was selected because from A.D. 843 onwards the river Scheldt formed a European border separating Carolingian *Francia Media* from *Francia Occidentalis* and later on, in the 10th century, the Ottonian empire from the French kingdom. As a border zone the Scheldt region is an ideal subject for the study of the development of settlements, pre-urban centres of habitation and fortifications. On the left bank of the Scheldt, in the territory of *Francia Occidentalis*, the Carolingian royal villa in Petegem and the Gravensteen (the moated castle of the counts of Flanders) in Ghent were among the important sites that were excavated and investigated (Callebaut 1991; Callebaut 1994).

The site of Ename was focused on the Ottonian right bank of the river. Around A.D. 1000 it formed in the *pagus Bracbatensis* (fig. 7.1) a margravian centre that, along with Antwerp and Valenciennes, was responsible for the military control of the Scheldt. Historical sources refer to a fortress, a trade settlement and two *portus* churches. The site was first occupied during the third quarter of the 10th century and fell into the hands of the count of Flanders, the opponent from across the Scheldt, in 1050. He demilitarised the Ottonian centre and founded a Benedictine abbey that lasted until the French Revolution in 1794.

The heritage of Ename has been preserved in a way that is exceptional for Belgium. It consists of:

- A large archaeological site of 8 ha, situated in the meadows along the Scheldt. The foundations of the early medieval fortress, the trading settlement (*portus*) and the Benedictine abbey are preserved here.
- The Saint Laurentius church. It is the only building still standing that dates from the Ottonian period of Ename.
- The landscape “Bos t’Ename” (the woods of Ename), characterised by its remarkable scientific, historic and aesthetic value.

The Bos t’Ename is situated on the eastern valley slope of the Scheldt and was protected as a landscape in 1981, because of its scientific and cultural-historical value. It is historically and ecologically one of the most thoroughly investigated woodlands in Europe. It contains a whole range of archaeological sites from various ages since the Middle-Neolithic, but especially from the Middle Ages. Since 1992 the area has been gradually acquired and is managed as a nature reserve, but with a major emphasis on its cultural-historical value. In 2002 the Bos t’Ename received the *Flemish Monument Award*. The area is designated as NATURA-2000 territory under European law and is part of a European LIFE-project. The investigation conducted by the Department of Monuments and Landscapes (at present: Urban Planning and Heritage) chiefly relied on the study of historical maps, paleobotanical research, pollen research and other approaches (Tack et al. 1993). For obvious reasons there were no large-scale excavations. Although the historical landscape of Bos t’Ename is an integral part of the global study of Ename, we will not consider it within the scope of this article.

The first excavations in Ename took place during the period from 1942 to 1946. Loam excavations for brick making in the *castrum* zone allowed A.L.J. Van de Walle to gather archaeological data that made it possible to locate an *aula* within the fortification and draw up its ground plan. He also carried out excavations in the zone where the Benedictine abbey was founded and dug up parts of the abbey complex.

In 1982 investigations resumed with an emergency excavation. At that time rescue archaeology did not yet have the same statutory position it has acquired today and personal networking was a particular source of information. And this was also the case for Ename. When we were told that work to broaden the Scheldt would begin in the autumn of 1982, the National Service for Excavations started an excavation in the threatened

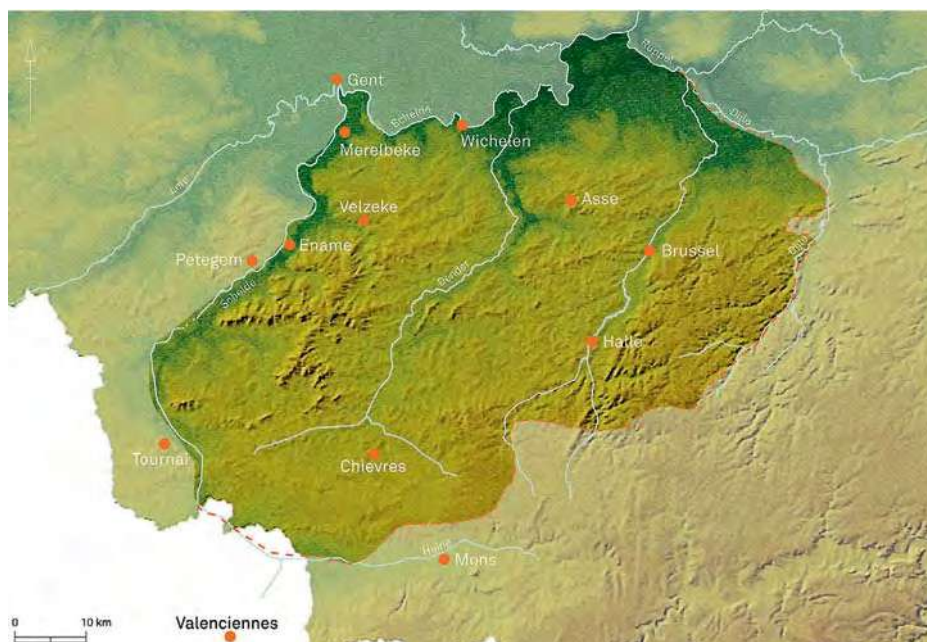


Fig. 7.1: Map showing the core area of the *pagus Bracbatensis* (according to Bonenfant 1935, 44 map II).

zone of the *castrum*. The results were so surprising that it was decided to carry out a large-scale investigation also in the non-threatened area of the *portus* and the Benedictine abbey, which would later be extended to the village centre of Ename (fig. 7.2). The motivation was to be found in the exceptional value Ename had for the aforementioned study of early medieval occupation and defence in the valley of the Scheldt because of its archaeological, monumental and environmental heritage. The *leitmotifs* of the investigation were items such as the origin, the dynamics of the environmental development and the significance of the site on a social level as well as on the level of the Ottonian policies.

2. Collecting data

To interpret the archaeological data from the Ottonian period of the site (third quarter of the 10th – first quarter of the 11th century) we refer to the *Gesta Episcoporum Cameracensium*, the first historical source that puts Ename on the map. The three volumes describe the history of the diocese of Cambrai-Arras from about 500 until 1024 and were written by a canon from Cambrai in 1024 to 1025: “*De villa Iham. Est etiam locus super Scaldum fluvium, quem dicunt Iham, ubi modernis temporibus honorabilis vir comes Godefridus et uxor sua Mathildis, matrona videlicet memorabilis – erat enim suum predium, suis usibus oportuno – castro quidem munito, navigium, mercatum, teloneum, ceteraque negotia statuerunt; infra castrum vero monasterium in honore sanctae Mariae, deputatis canonicis, fundaverunt. Extra autem Herimannus filius duo monasteria struxit, unum sancto Laurentio, alterum vero sancto Salvatore. Nunc igitur locus, utpote noviter intructus, ex omni sufficientia floret, et tamen esset uberius, nisi crebro hostili incursione quateretur, quod maxime ab inimicis Dei patitur pro stabilitate regni et fidelitate imperatoris*” (Bethmann 1846, 465).

The part of the text dealing with Ename refers to two important occupation phases. The first consists of the establishment of the settlement, which was managed by count Godfried and his wife Mathildis (second half of

10th century). They founded a fortification with an adjoining trade settlement or *portus*. The *castrum* contained a church dedicated to Our Lady and had a chapter of canons. Trade flourished in the settlement with shipping, a market, toll collection and “other activities”. Herman, Godfried’s son, led the second phase (first quarter of 11th century) and built two churches outside the *castrum*.

The excavations revealed an important amount of archaeological data. Together with the historical dates, the relative chronology of the main occupation phases and a series of radiocarbon dates, they made it possible to develop a general chronological framework for the site (Callebaut 1991; Callebaut 1994; Callebaut et al. 2002; Callebaut 2010; De Groote 2008).

Castrum

The fortress is situated on the northern end of a sand-loam tongue of land surrounded by a meander of the river Scheldt (fig. 7.3: A). The southern open landside of the fortification was closed off by a ditch that was 18 m wide and 140 m long (fig. 7.3: 2). However, only very few traces of the first occupation phase have been preserved within this *castrum* area, because the zone was dug out by the ground works for the brickworks during the 1940s (fig. 7.3: 3). The only untouched spot was directly under the railway line between Brussels and Kortrijk that was built across the site. In 1983 part of the railway bank was removed because of the canalisation of the Scheldt and, totally unexpectedly, an unspoiled part of the *castrum* was exposed. The only traces that go back to the occupation phase of Godfried and Mathildis consist of four layers characterised by the presence of patches of ash, lumps of charcoal and ground that was burned *in situ*. The animal remains that were recovered from the layers are part of the consumption waste of a noble site. Radiocarbon analysis on animal bones from the layers points to a dating in the second half of the 10th century. We have no more information about that first *castrum* occupation phase. The building complex must have been significant, as the presence of the church of Our Lady indicates, with a chapter of canons attached to it. However, everything remains in a state of uncertainty archaeologically.

Fig. 7.2: Ename. General view of the excavations of the *castrum* and the Benedictine abbey, under which the foundations of the *portus* were found.



Herman of Verdun, the son of Godfried of Verdun, developed the *castrum* into a prestigious centre of military power and political influence. Two important stone constructions in limestone from Tournai dominated the fortress. The first is situated in a corner formed by the Scheldt and the *castrum* ditch that closed off the landward side of the fortification (fig. 7.3: 2). It is a hall that measures 27 m by 10 m on the inside and is orientated east-west. The foundations were up to 3 m deep and rested on a horizontal framework of two rows of tree trunks lying crosswise (fig. 7.4). The aboveground masonry itself was preserved only partially. The eastern front was 4.40 m thick, the southern wall 3 m. Its strategic position, among other elements, clearly proves this to be a keep. At right angles with the west side of the *turris* a 1.40 m thick wall was cut into. It was completely broken away and only a portion could be excavated. Possibly it was a wall of defence behind the *castrum* ditch, which connected with the keep.

A residential building stood centrally in the area of the fortification (fig. 7.3: 1). During the excavations of the 1940s, before the brickworks became operative, A.L.J. Van de Walle managed to plot the foundations. We completed the picture during the excavations in the 1990s. Only the bottom layers of the 1.90 m broad foundation walls were preserved. In the first phase the residence consisted of a hall adjoined by a room with an apse on the east side, apparently an *aula* and a *capella* (fig. 7.5). In a later phase an annex was built on the west side, which we consider to be the *camera*. How-

ever, it is not certain that this annex was part of the Ottonian residence. It may also have been a later addition during the abbey phase (see below). Between the residence, which measured 40 m by 11 m, and the keep we found post holes of an important wooden building and a peaty depression with a lot of sunken occupation waste (fig. 7.3: 3). Radiocarbon analysis of the foundation latticework of the keep, of bone material from the depression and of vegetable material from the mortar of the *aula* shows that both stone constructions were



Fig. 7.3: Situation plan of Ottonian Ename (second half 10th to first half 11th century). A: *castrum* with residence and Our Lady's church (1), keep and *castrum* moat (2) and depression with rubbish dump (3); B: trade settlement with Saint Salvator's church (4) and Saint Laurentius church (5).

erected roughly at the same time at the very end of the 10th century or during the first years of the 11th century. The rubbish dump in the depression dates from the time that the keep was put to use in the first quarter of the 11th century.

Portus

The origin of the *portus* of Enneme is connected with the foundation of the *castrum* at the end of the third quarter of the 10th century. As stated before, the *Gesta episcoporum Cameracensium* recorded that the first margrave Godfried of Verdun and his wife Mathildis are responsible for founding a market, stimulating navigation and installing a toll. His successor Herman of Verdun erected two churches, probably between 999 and 1002. The foundation of the abbey in 1063 caused the end of the existence of the pre-urban settlement of Enneme. The area of the trade settlement was dominated by two stone churches dedicated to Saint Salvator (fig. 7.3: 4) and Saint Laurentius (fig. 7.3: 5) respectively. In the excavated area around the Saint Salvator's church, all archaeological remains from the *portus* period can be dated between 963 and 1063. This time period of 100 years can be divided into four subperiods, based on the stratigraphy of the complex of ditches in that area. Supplementary information comes from other archaeological data, such as traces of artisanal activities, the presence of a layer of arable land, remains of a rampart, and so on ... Ten radiocarbon dates provide additional dating elements (De Groote 2008, 41–58).



Period A

Artisanal activities characterise this phase (fig. 7.6: A). The occupation is intense, resulting in a lot of archaeological traces, such as ditches with several subphases, a lot of post holes (no houseplans were preserved), two so called *Grubenhäuser* or sunken huts, two hearths, tens of pits and three remains of kilns. The ditches from this phase run parallel with a 15 m long row of large post holes, the interpretation of which is not clear at this moment. Remarkably, the axis of the stone church, built during the following period B, has a different orientation. The ditches of period B cut the remains of this first occupation.

Five radiocarbon dates are available for this period, three on animal bone and two on charcoal. The probability distributions of 68.2 % statistical reliability of the calibrated dates show that the main part of the curves are always situated in the last quarter of the 10th century. The charcoal dates result in two somewhat older dates, probably caused by the so-called old-wood-effect. The historical dates for this period are the foundation of the *castrum* in the middle of the third quarter of the 10th century and the foundation of the two churches by Herman of Verdun in the period between 999 and 1002.

When comparing the historical dates with the results of the radiocarbon analyses, it is clear that the curves of 4 of the 5 radiocarbon dates mainly fit in the period marked out by the historical sources. Supported by this data it can be concluded that period A must be dated after 962/963 and before 999/1002.

Period B

The building of the stone church marks the start of this phase (fig. 7.6: B). The ditches appear to be perfectly aligned with the church. In the interior of this church-lot, all older traces were covered by a dark grey layer, interpreted as an old agricultural layer. The end of this period is marked by the construction of a large rampart and a wide moat, cutting or covering the traces of period B. In the agricultural layer a worn silver coin was found, minted by one of the Ottonian emperors and dating between A.D. 962 and 1002. Only one radiocarbon date is available for this period, coming from an animal bone. With a probability of 68.2 %, the calibrated date is situated between 998 and 1027, to be summarised as the first quarter of the 11th century.

Two historical dates are linked with Period B. On the one hand there is the foundation of the Saint Salvator's Church in 999/1002 by Herman of Verdun, which marks the beginning of this period, on the other hand the conquest of the *castrum* by the Flemish Count in 1033. This was probably the occasion for the rearrangement of the site, of which the construction of the moat and rampart around the church was one of the results. Based on these elements, period B can be dated between 999/1002 and 1033.

Period C

A moat with a large rampart was constructed around the Church of Saint Salvator (fig. 7.6: C). The moat is 18 to 20 m wide at the south and east sides, and about 3 m

Fig. 7.4: Enneme, *castrum*. Foundations of the keep: a framework of crosswise stacked tree-trunks.



Fig. 7.5: Ename, *castrum*.

Foundations of the residence in limestone from Tournai; the camera is in front, the *aula* in the middle.

deep. The rampart was about 15 m wide and covered most parts of the ditch around the church plot from period B and the occupation layers within. In the western and the northern parts, on the alluvial ground, the moat is much smaller, only about 9 or 10 m wide, with a minimum depth of about 1.8 m. The oldest layer on the south side contained a large amount of well-preserved vegetable remains. Radiocarbon analysis of this material resulted in a date that is situated in a wiggle of the calibration curve. This causes a large calibrated date with three peaks. With a probability distribution of 68.2 %, these peaks are situated between 1020–1050, 1080–1120 and 1130–1150. Because of the foundation date of the abbey in 1063, the date of the moat can only be situated in the first peak between 1020 and 1050. The same layer also contained a silver coin, minted in Flanders between 1020 and 1050 under the rule of Baldwin IV or V of Flanders.

Both dates seem to confirm the hypothesis that the moat and the rampart were constructed after the conquest of the *castrum* in 1033 by count Baldwin IV of Flanders. This event seems to have been the start of the reorganisation of the church area to a zone that probably served as a refuge for unsafe times. For the ending of this period, only a historical date is available. Between 1047 and 1050 Ename is known to have become part of the County of Flanders. Period C can thus be dated between 1033 and 1047/1050.

Period D

This is the last phase of the *portus*, before the construction of the abbey between 1063 and 1070 (fig. 7.6: D). A series of small ditches and postholes, a burnt layer and a large pit belong to this period. These traces crossed the remnants of the rampart and were cut by the foundations of the first abbey buildings.

Two radiocarbon dates are available, taken from animal bone from the two main contexts. The already mentioned wiggles in the calibration curve of the middle

of the 11th until the end of the 12th century cause a wide dating range with three peaks. As stated for period C, only the peak situated before the building of the abbey between 1063 and 1070 is applicable. But these results do not help to answer the question whether the period D traces are remains of the late *portus* settlement, part of the very beginning of the abbey or of the years before or during the construction of the new abbey buildings. Based on archaeological (stratigraphical) data, it is certain that the traces of period D are older than the construction of the abbey and younger than the demolition of (a part of) the earthworks of period C. Based on the historical dates connected with these events, period D can be dated between 1047/1050 and 1063/1070.

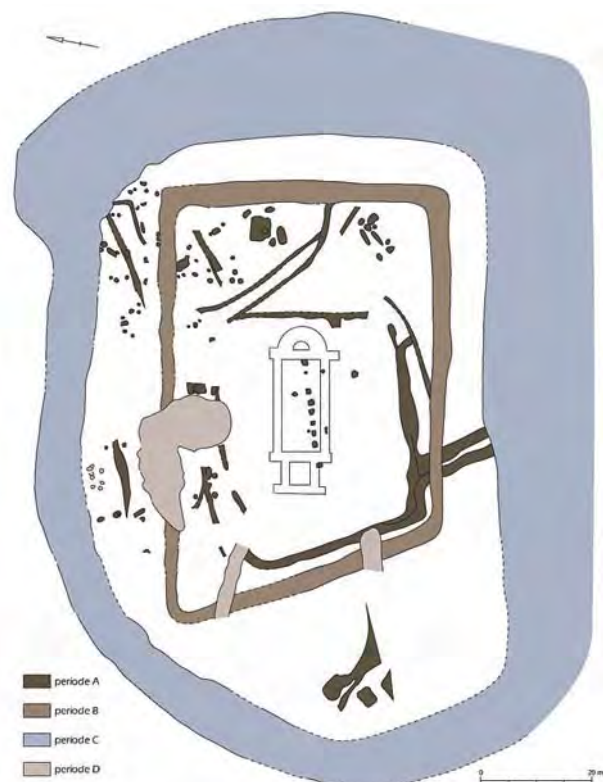


Fig. 7.6: Ename. General plan of the *portus* traces in the zone of the Saint Salvator's church (from De Groote 2008, fig. 14).

The trade settlement is marked by the two stone churches dedicated respectively to Saint Salvator and Saint Laurentius and founded by Herman, according to the *Gesta*. The Saint Salvator's church has been completely excavated. It is a hall church with an apse as the eastern choir. To the west there is a square annex, which we also consider to be a choir.

The Saint Laurentius church

This is the only Ottonian monument that has been preserved (see fig. 7.12). Before the restoration in the period 2000–2002 the building consisted of a flatly closed west choir, a basilical church with three naves and a square east tower. During the consolidation of this tower the Institute for the Archaeological Patrimony (now the Flemish Heritage Institute) carried out a few trial trenches. This was the beginning of a thorough investigation in which archaeological, historical, architectural-historical and iconological research were combined with scientific analysis and material study (Callebaut 1992; Callebaut et al. 2001; Callebaut 2010; De Groote 2008, 62–63) (fig. 7.7). The church was built in limestone from Tournai on the highest point of the present village centre on a plot that was used as a field during the Roman period. First the foundations were laid for a hall church with an eastern and western square choir. Then the building activities were interrupted, the plans were changed and a basilical church with two choirs was built using the existing foundations (fig. 7.8). Such a building does not fit into the architectural landscape of church tradition in Flanders. Indeed, it is a basilical church with an east and a west choir. Especially the east choir is remarkable with its two altar floors and rich incidence of light. The architectural ornaments inside are dominated by blind arches that add a strong rhythm to the walls of both choirs. Blind arches also adorn the outside of the east choir. The entrances were in the aisles. The original mortar floor was preserved fragmentarily. The preserved interior elements such as the graffiti and the murals are of exceptional value, especially the fresco of the *Majestas Domini*, inspired by Byzantine examples. According to the ¹⁴C-analysis the painting dates from the first quarter of the 11th century (fig. 7.9). Because it

was constructed on top of an older finishing layer, we can date the building of the church itself at the end of the 10th – beginning of the 11th century. This matches the historical date when Herman of Verdun erected the church, around 999/1002. We also have to mention that, originally, the church was fully plastered on the outside. Indeed, important remnants of white-beige plasterwork were found under the present roofs of the aisles. Just like around the Saint Martinus church in Velzeke, ditches were dug around the Saint Laurentius church, which probably marked out the church area (De Groote 2008, 58–62). The oldest section may date back to the building of the church around the turn of the century.

The Benedictine abbey

The abbey of Ename is built around the Saint Salvator church, which thus evolved from *portus* church to abbey church. The central monastery complex was completely excavated between 1983 and 1996 (Callebaut 1991; De Groote 2008, 49–58). The investigation of the annexes north of the central building was largely completed in 2002 (fig. 7.10).

The abbey was founded in 1063 by the Flemish count Baldwin V and countess Adela. During the first years the monks lived in the former fortress of Ename. They moved into a new monastery building built up against the former *portus* church in 1070 at the very latest. From 1139 onwards a new basilical church was being built at the site of the old hall church. During the following period (until the middle of the 13th century) the 11th-century monastery was pulled down and replaced by a much larger complex. There were also extensions eastward containing the infirmary near the second cloister and northward by reclamation of the land next to the old arm of the Scheldt and the erection of a large detached building in limestone from Tournai. This formed the centre of the later building complex that is known as the artisanal sector. South of the infirmary abbot Van Strijpen founded the Saint Livinus chapel before 1292. It was transformed into the priory in the 17th century.

In the 14th as well as in the 15th century the abbey repeatedly suffered the effects of military action. In the period 1578–1582 it was largely destroyed by the Ghent



Fig. 7.7: Excavations in the nave of the Saint Laurentius church.

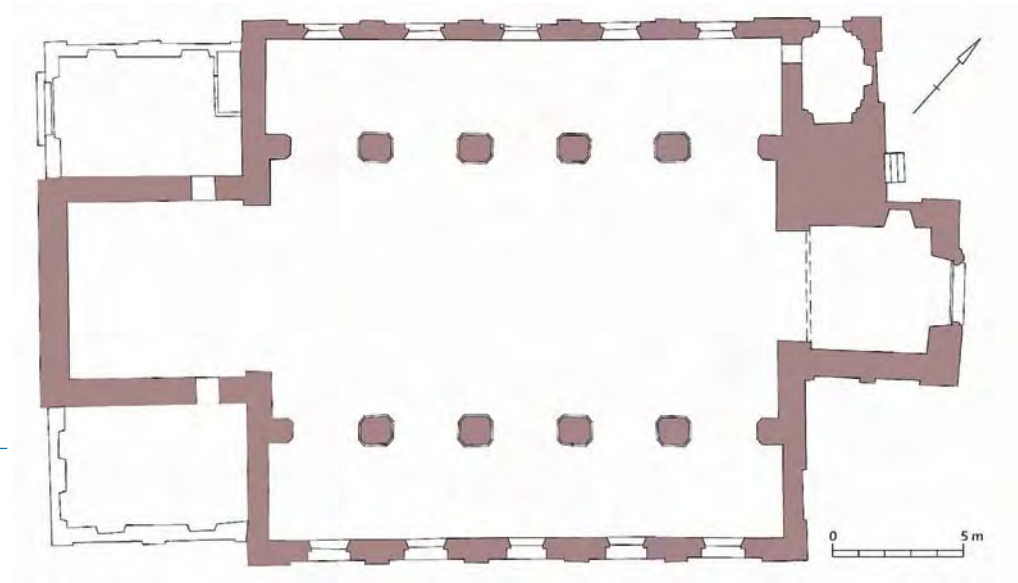


Fig. 7.8: Ename. Saint Laurentius church. Ground plan of the basilical building with an east and a west choir.

Calvinists, who reinforced the ramparts of Oudenaarde with the building materials they had removed from the abbey. After a lengthy period of rebuilding in the 17th century and a final phase in the 18th century the Saint Salvator abbey was abolished by the French rulers in 1794 and largely demolished shortly afterwards.

3. Understanding the evidence

Collecting data, technically analysing it and putting the material into a chronological framework is only part of the job. Archaeological excavations only achieve value when the collected data is shown to be of more consequence than the mere interpretation of the foundations – hence the significance of study themes such as the early medieval occupation and defence in the Scheldt valley. Within the framework of such a project one is not allowed to limit oneself to the study of the excavated foundations in the *castrum*, *portus* and Benedictine abbey, but one has to consider the data from a much broader point of view.

Let us restrict ourselves to one exemplary research example: the growing regional dynamics in the Scheldt area around Ename. In order to formulate sensible ideas about this matter, the archaeological foundations from the original phase of the Ottonian site, the building heritage of Ename from the year 1000 and the 10th to 16th century ceramics in the Ename-Oudenaarde region were investigated respectively.

Archaeological foundations from the original phase of the Ottonian site

As far as Ename is concerned, we can only talk about regional dynamics surpassing the proper rural domain from the moment the site caught the attention of the Ottonian imperial authority. Generally speaking, this is related to the establishment by the Ottonian rulers of a margravian system along the river Scheldt with Valenciennes, Ename and Antwerp as its centres. They were located respectively in the *pagi Hanonensis*, *Bracbatensis* and *Renensium*. There is some doubt about the point in time and the circumstances of the system being implemented. For Ename specifically it is widely accepted that

Fig. 7.9: During the architectural-historical investigation of the interior of the Saint Laurentius church a *Majestas Domini* mural paint in Byzantine style from the first quarter of the 11th century was uncovered. The date and style of this painting is exceptional in Belgium (Photo: Institute for the Archaeological Patrimony).





Fig. 7.10: Ename, Saint Salvator's abbey. General view of the excavated foundations (Photo: Hendrik Timmerman).

the foundation of the centre took place around 974 and that the fortress, as a defensive bulwark against the East Frankish king and the count of Flanders, was something like a catalyst for the whole development. At first the archaeological results seemed to back up this theory. The *castrum* with its keep and *palatium* really formed a military centre along the Ottonian imperial frontier.

In a recent study however, another idea was put forward (Callebaut 2010). The starting point was the radiocarbon investigation that showed that the stone building phase of the *castrum* dated from around the year thousand (Callebaut et al. 2002). There was an occupation before that time, of which ultimately, as far as the fortification is concerned, very little is known archaeologically, but of which can be stated that it was a noble residence dating from the second half of the 10th century. In order to interpret this fact, historical source material was brought in. The founders of Ename were Godfried of Verdun, the forefather of the Ardenne-Verdun clan, and Mathildis Billung. Both belonged to the leading aristocracy of the western and eastern border regions of the Ottonian realm. Godfried had his roots in Lorraine and Mathilde in Saxony, the tribal land of the Ottonian emperors. She had been given in marriage to the Flemish count Baldwin III in 961 and they had a son, Alfred II. A good year after their marriage, however, her husband died. Shortly afterwards, around 962/963, Mathildis remarried with Godfried of Verdun.

The aforementioned *Gesta Episcoporum Cameracensium* mentions that Mathildis owned the *villa lham* (Ename) and that she was allowed to build a fortress, organise a market and regulate shipping. These are clearly *regalia* that enabled the Saxon princess, together with her new husband, to develop a site along the Scheldt with considerable economic possibilities. It is not clear how Mathildis got in possession of the domain of Ename. But there is a strong chance that it was a dowry. A few other Ottonian donations indeed prove that Scheldt domains were highly appreciated as wedding gifts. For example, in 972 Otto II gave imperial possessions in Walcheren and Wichelen as a dowry to his Byzantine wife Theophanu. Presumably the donations for Mathildis were not restricted to the villa Ename only.

We may well assume that the site of Velzeke also came into her possession. The site goes back to a Roman *vicus* that flourished during the 1st and 2nd centuries A.D. and developed into an important administrative centre in the region. There are indications that Velzeke was an imperial property in the early medieval period that had kept its function as a regional centre of government.

Archaeological and architectural-historical investigations by the Provincial Archaeological Museum of Velzeke showed that the present church still has quite a number of building elements (such as an east choir) that date back to the third quarter of the 10th century (fig. 7.11). Just as the Saint Laurentius church in Ename, which was built later (see below), it appears to be an imperial church with two choirs (Rogge & Deschietter 2007; Callebaut 2010). The fact that there is such an important building in Velzeke proves that the site was really significant for the Ottonian imperial authority during the third quarter of the 10th century. In this period there was a lot of internal unrest partly due to the rebellious behaviour of the indigenous nobility, of which the Reginars were the instigators.

Velzeke and Ename got the Ottonian attention around the same time and both probably came into the hands of Mathilde Billung as a dowry: all this allows us to explain Ename's rise otherwise than to merely consider its military role as a marginal border fortress.

When Mathildis Billung remarried the Lorraine count Godfried of Verdun after the death of her first husband, the Flemish count Baldwin III, this marriage offered a splendid opportunity to establish a strong representation of the Ottonian authority in the *pagus bracbatensis*. However, Godfried and Mathildis did not belong to the indigenous nobility of the *pagus*, but were 'strangers' in the region. This possibly explains the territorial strategy developed by the Ottonian top brass to assign to Godfried and Mathildis two locations with a specific function each: firstly Ename because the site along the Scheldt offered important financial possibilities and secondly Velzeke because the place was of administrative importance. By linking an administrative seat to a trade centre, Godfried was given sufficient guarantees to make good his function as a count in at least one part of the *pagus bracbatensis*.



Fig. 7.11: Velzeke, Saint Martin's church. View from the southeast. In front, the Ottonian choir dating from the the third quarter of the 10th century (© pam Velzeke).

Assuming that economic considerations were at the basis of the foundation of the Ottonian centre in Ename, the question remains about the fortress Godfried built along the Scheldt. However, this fortification does not necessarily have to be seen as a bulwark in a military border defence. There are other options, as the case of Câteau-Cambrésis in the diocese of Cambrai proves. To defend the interests of his bishop Erluinus, Otto III had allowed the aforementioned to establish a trade centre, possibly with a market, to levy toll, to mint coins and to hold judicial and public offices. He could also build a fortress to thwart plunderers and to protect the farmers in the vicinity. In other words: the fortification had to ensure the security of the agricultural production.

This could also have happened in Ename. Because the site was conceived as a centre that could finance the power base of Godfried, it is not unlikely that the fortification was meant for the protection of economic production, just as in Câteau-Cambrésis. In this respect we may also notice, for example, that a busy occupation with artisanal activities developed in the zone next to the *castrum* during the second half of the 10th century (see above). In that same period the fortress had a lot to control and secure indeed. In short, it is clear that this regional development was started under optimal circumstances. And the site would flourish remarkably, as the building programme around the year 1000 proves.

Architectural heritage of Ename around the year 1000

The results of the archaeological research have shown how the site surprisingly boomed at the end of the 10th – beginning of the 11th century. Prestigious stone buildings drew attention to Ename's most remarkable locations: the *castrum* with its keep and residence and the two churches, Saint Salvator and Saint Laurentius. They are all marks of a notable evolution with various facets.

Of course, the Ottonian Saint Laurentius church is Ename's eye-catcher, not only because of the good preservation of the original monument, but also because of the intrinsic value of its architecture. With

its two choirs, blind niches and murals it occupies a distinct position in the early medieval architecture of Flanders (fig. 7.12).

The iconological study of the church throws a light on the motives of Herman of Verdun who commissioned the building. He opted for a building programme that had to reflect a direct bond of the patron with the imperial authority, just as in the church of Velzeke. Hence the two choirs, which can also be found in the large imperial churches, and the pronounced presence of blind arches. This motive can be described as 'from Ravenna' because it refers, among other things, to a building style in Ravenna, the favourite place of residence of the Ottonians in Italy. From the end of the 10th century onwards blind arches appear in important Ottonian centres and may be considered to be an 'imperial hallmark'. Their dissemination fits in with the *Renovatio Romani Imperii* by the Ottonian court. The construction of the eastern part with the two superimposed choirs and the three arcades under an 'übergreifende' arch refer to the palatine chapel in Aachen. Finally, the patron saint, Laurentius, is connected with the ideology of the emperor.

Regional dynamics in the Scheldt area

What does the realisation of the global building programme tell us about the development of regional dynamics in the Scheldt area around Ename?

First of all the patron, Herman of Verdun, must have had adequate means at his disposal to commission such an impressive building complex. This implies the existence of an agricultural production with sufficient surpluses, a region with economic dynamics and a controlling structure that manages all of this in a purposeful and efficient way. One does not achieve any of this in the short term. Ename beautifully illustrates this evolutionary process. The site was situated favourably in a region that was already highly cultivated with plenty of arable land and was blessed by the economic advantages that the Scheldt offered. However, between the foundation of Ename under the rule of Godfried and Mathildis and the large-scale building campaigns of Herman, more than thirty years passed.



Fig. 7.12: Ename, Saint Laurentius church. View from the northeast of the restored church with its eastern part richly decorated with blind arches.

The buildings themselves not only illustrate the dominance of the nobility and the clergy in the community of Ename, but also revealed that the site as such had acquired a very important status. This particular position is specifically highlighted in the *Auctarium Affligemense*, where the location is described as the “*sedes principalis ducatus regni Lotharici*” (Gorissen 1952, 111). This might be an exaggeration, but it cannot be denied that Ename had acquired a special place in the events concerning the Scheldt at the millennium. The residence built in the centre of the *castrum*, is a case in point. With its *aula* and *capella* the building was, as it were, the symbol of Ename’s display of power. This is where the official receptions took place, administrative affairs were dealt with, justice was administered and canons prayed for the welfare of the Ardenne-Verdun family. This whole range of activities transcends the level of the original *villa lham* and justifies the assumption that Ename had developed into a place of military, administrative and artistic grandeur. This fact alone forces us to look at what happened across the river Scheldt, in Flanders.

Count Baldwin IV, grandson of Mathilde Billung, had started a fundamental administrative reorganisation of his county, Flanders, in the winter of 993/994. Although the historical sources only provide very limited information it is plausible that a great part of the county was divided into regional entities called castellanies. Three of them are known: Ghent, Tournai and Bruges. The administration in these entities was fully focused on the fortresses of the counts in Ghent, Tournai and Bruges. The *castellanus* was recruited from the upper nobility of Flanders and, as a key figure in the regional organisation, always operated in the name of the count of Flanders. This way Baldwin IV wanted to give his authority as a count a strong foundation. It is remarkable that two sites that would acquire a central position of power because of the reorganisation by Baldwin IV were situated along the Scheldt: the count’s fortresses of Ghent and Tournai. Ename was in between.

Did those who took the Ottonian interests to heart at the other side of the river consider this reorganisation to be a threat? And was this one of the reasons why Ename became politically and strategically more important than before, and, moreover, strategically so important that the means of Ename were used to develop the site into a prestigious complex as a challenging token of its strength? It seems a plausible explanation, because Baldwin IV started to pursue a really aggressive policy along the Scheldt border with attacks against, among others, the Ottonian margravian centres of Valenciennes (1006) and Ename (1033).

These turbulent times are referred to in the *Gesta*, where it is stated that the situation in Ename would have been more favourable without the repeated enemy attacks – “*crebro hostili incursion*”. However, Ename had to stand its ground “*pro stabilitate regni et fidelitate imperatoris*”. This phrase makes clear what the purpose of Ename was: it had to help to guarantee the stability within *Lotharingia* and, moreover, it had to be recognised as a symbol of loyalty to the emperor in an area that was under heavy pressure. The Saint Laurentius church conveyed this message (fig. 7.13). The white building rose on the highest point of the site turning its facade (*‘Schauseite’*) to the empire. Its whole concept referred to the big imperial churches and thus expressed Ename’s loyalty to the imperial authority. Besides, we may not forget that the Saint Laurentius church is only one of the four monuments that had to propagate and substantiate the Ottonian grandeur in Ename. Maybe the words *stabilitas* and *fidelitas*, recorded years later in the *Gesta*, indeed reflect the essential reason why this building programme was developed in Ename and transformed the site into a showpiece of Ottonian steadfastness.

In 1047 the inevitable happened: the Flemish count Baldwin V definitively took possession of the margravian centre. He demilitarised Ename by founding a Benedictine abbey on the site in 1063. This meant the end of all the political ambitions that had coloured the past of this village.

Fig. 7.13: Evocation of Ottonian Ename around the turn of the millennium. In his *Historiae*, Radulfus Glaber (c. 985–1045/47) wrote that, shortly after the year thousand, it seemed as if the world had shaken off its age and cloaked itself in a white mantle of churches. With the impressive building projects that were being developed at the time and its white-plastered Saint Laurentius church, Ename corresponded remarkably well to the image that the benedictine monk had sketched of his world around the year 1000 (virtual reconstruction: Daniël Pletinckx – Visual Dimensions bvba.)



From a household economy to a well-established standardised production

Not only the archaeological foundations and the monumental heritage inform us about the regional dynamics in the Scheldt area around Ename, but also the study of the ceramic finds provides a lot of information. We will now consider the approach of such an investigation.

In 2005 a doctoral thesis was presented at the University of Brussels (VUB) on the subject: “The pottery in the region of Oudenaarde in the high medieval and late medieval period (10th–16th century): technical and typological analysis, chronology, evolution and meanings”, and was published in 2008 (De Groote 2004; De Groote 2008). Based on a balanced methodology, this study makes a detailed analysis of medieval pottery from the region of Oudenaarde, working with an archaeological dataset of about 46,000 sherds, coming from 11 sites from the region. Most of the pottery assemblages studied derive from Ename, from both the 10th to 11th century contexts of the *castrum* and its *portus*, and from the 12th to 16th century contexts of the Benedictine abbey. Other important assemblages were excavated at the sites of ‘Ename-Huis Beernaert’ (11th–13th century ditches), ‘Oudenaarde-Huis de Lalaing’ (14th century pottery production site) and ‘Petegem-Beaulieu’ (large early 16th century monastic assemblage).

For the purpose of this analysis, a detailed methodology was constructed, based on existing models. Both local and imported wares were analysed, covering a period from the 10th to the first half of the 16th century. In total, the study examined pottery from hundreds of large and small archaeological assemblages from well-stratified deposits excavated at 11 different sites. The primary aims were to develop knowledge about the nature and development of the use of ceramics through time, within a micro-region, to assess the problems arising from this kind of research, and to evaluate the nature and quality of the information gathered.

The results of this research are situated in different fields. An important achievement is that a methodol-

ogy for the detailed documentation and recording of excavated pottery was developed. This included the establishment of a set of well-defined parameters to describe easily the technical characteristics of the pottery fabrics. Furthermore, a balanced recording method was put forward for the typological characteristics of all types of finds, ranging from complete pots to small sherds.

The recording of the technical features of pottery from local and regional origin provided the basic information necessary to classify fabrics, major wares and ceramic groups. In this way, ceramic development from the late 9th to the first half of the 16th century could be reconstructed. For example, it was possible to identify, describe and date a hitherto unknown pottery group representing a regional production of Pingsdorf-type ware imitations. A very important result was the possibility to date the shift from hand-built pottery, the result of household production, to wheel-thrown pottery, derived from an organised industrial production, between the second half of the 11th and the first half of the 12th century. The first appearance of glazed redware can be situated in the middle of the 12th century, and the chronology of its technical evolution is traced for the first time. The results also show that the lasting importance of greyware, until the first half of the 16th century, appears to be a general phenomenon in the region.

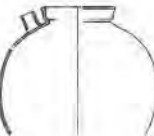
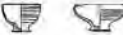
The detailed typological analysis of all fragments resulted in a huge dataset of vessel characteristics. This dataset allowed the construction of a typo-chronology of more than 30 well-defined form types. A detailed overview of the typological development of vessel types is established, taking into account the relation between fabric, form, decoration and use.

This made it possible to map the development of the spectrum of pottery types over six centuries, comprising four main phases (fig. 7.14). Through this synthesis, it is possible to follow the appearance and disappearance of certain form types, and their interaction within the local pottery production, on one hand, and with the imports, on the other. It also provides derived information about production and distribution. The

combination of the large amount of technical and typological information from both local and imported wares resulted in an overview of trends in the composition of the ceramic spectrum in the region of Oudenaarde, from the late 9th/10th century until the first half of the 16th century.

Based on both direct and deduced information, some economic, social and cultural interpretations can be drawn, dealing with broad themes such as pottery production, ceramic consumption, identity, use, food, housing and living conditions, trade and distribution, etc. For example the appearance, in the late 10th cen-

Fig. 7.14: Overview of the evolution in the presence of the main ceramic forms in the Oudenaarde region from the 10th to the early 16th century. A century is represented by a cipher, half a century by a capital, a quarter of a century by a small letter (from De Groote 2008, fig. 233).

Phase 1: 10 - 12A	Phase 2: 12B - 13a	13	Phase 3: 14	Phase 4: 15 - 16a
 	  	 		 
 	  	  	  	  
		   	     	           

tury, of local red-painted ware, a local imitation of Pingsdorf-type ware that was probably produced in the larger urban trade settlements of that time (Ghent, Tournai, Bruges, etc.), can be seen as an early expression of competition in the local ceramic production. This provides a strong indication of the appearance of a commercial ceramic market at that moment. The local red-painted wares can be considered as an early (and marginal) phenomenon connected with urban development in Flanders, and with the evolution towards a market economy. The switch from a simple, technically very heterogeneous pottery production on a household or village scale, to a standardised production by well-organised pottery workshops, must be situated in the second half of the 11th and the first half of the 12th century. The rise of local pottery workshops, in or near urban centres (*in casu* Oudenaarde), can be considered as a break in the local pottery production, marking the shift from a domestic economy to one driven by a market economy. The continuous introduction of innovations in the following century, the quick response to new developments and the dominant position of the local ceramic markets are significant indications that the local pottery workshops achieved a strong position with good organisation in a rather short period.

A comparison with pottery studies in the surrounding regions, in western Belgium and northern France, shows that the typological evolution of pottery can differ strongly by region, but that regions with similar pottery characteristics can be recognised. The overall conclusion of the comparative study must be that the regional factor is very important in the development of pottery in Flanders. Consequently, it is essential that technical and typo-chronological analyses are carried out in a regional context first. Within such a first, basic analysis, technical and typo-chronological comparisons with local pottery from distant regions have to be avoided.

This study proves the value and the importance of large-scale pottery research on a (micro) regional basis. However, important conclusions for medieval archaeological studies in general, can also be drawn. In spite of the value of extensive pottery studies on site level, it is clear that the only way to really progress pottery research is a detailed analysis of large amounts of material from well-selected high standard contexts, covering a large chronological period within a certain region. Separate studies of one or more assemblages from one site can only provide enough data for a combined large-scale pottery study if the analysis is always carried out in a coherent way, using the same methodology and the same system of typological classification. Only the study of assemblages from a large chronological period within a certain region allows the detection of broad developments and the interpretation of relationships between other developments. The lack of such a coherent approach will prevent the tracing of that kind of information. Pottery research on this scale is not only important to the study of the technical and typological development of ceramics, and to detect developments in material culture, but can also make important contributions to specific historical questions and discussion, for example the regional dynamics in the Scheldt region around Ename-Oudenaarde.

4. Realising sustainability

The large-scale excavations in Ename were possible thanks to an intergovernmental collaboration between the Flemish Region, the government of the Province of East Flanders and the town council of Oudenaarde, which, as far as Belgium is concerned, was rather exceptional. Because these three political levels were intensively involved in the whole project, they rightly demanded sustainable results for the support they had offered. This caused an unexpected development as the project evolved from a strictly scholarly research enterprise to a far broader programme of conservation and public interpretation. It was important that, from the beginning, we sought to involve the modern community of Ename in the recovery and preservation of their important heritage. We were fortunate to receive the wholehearted support of the local, provincial and regional authorities in making the project something more than a scholarly undertaking alone. Slowly, with the development of public education programmes and with the involvement of local groups in our work, we recognised the human dimensions of the project. We came to recognise that we were not only scholars with a defined research agenda, but were also participants in the recovery of a living community's heritage. From that point on the character of the project shifted. Site interpretation was no longer based on scholarly 'facts and figures' but also on the recognition that we were involved in a cooperative enterprise with the people of Ename itself.

Realisations

A first important realisation was the *Ename Provincial Archaeological Museum* (**pam**Ename) which is located in the 19th century Huis Beernaert (Callebaut & Van der Donckt 2004; Vanvaeck 2004). This elegant residence is situated in the historical village centre and is flanked by the Saint Laurentius church (fig. 7.15). It is a symbolic site where the stone grandeur of an imperial past and the charms of village life meet. The building had been converted for industrial use during the 20th century and was purchased by the Province of East Flanders to house the museum, which was opened to the public in September 1998. The museum explores the daily life of the community of Ename during 1000 years, from the early Middle Ages until the 20th century. The purpose is to open the visitors' eyes to the history that is all around them. Therefore the past is presented as a puzzle pieced together again by scientific research. Visitors are able to learn how this is done by assembling the pieces themselves with the help of available interactive techniques. The most fascinating room is the 'Feast of a 1000 Years', which is designed to tell stories about objects, trying to link the object to the person who once used it. This way material culture loses its anonymity and gets lifelike value. In 2000 **pam**Ename became a *Regional Museum* recognised by the Flemish Community and in 2001 it was nominated for the *European Museum Award*.

A second sustainable result of the archaeological investigation in Ename was the restoration of the Saint Laurentius church. The first excavation was carried out whilst testing the stability of the east tower and formed the starting point for a comprehensive, architectural-historical, archaeological and iconological

study of the building (see above). The results were so surprising that the Department for Monuments and Landscapes abandoned the original plans for maintenance work on the church tower only and decided, on the basis of the study results, to deal with the whole building. It is significant that the intense multidisciplinary investigation determined the restoration concept. Because the early medieval building was original and recognisable, the central axis of the church, very exceptionally, was restored to its primitive form. Along with the nave the west and east choirs regained their Ottonian glory, the floor was brought back to its Ottonian level and the original entrances in the aisles were reopened (fig. 7.16). This restoration project was recognised by the European Commission as “model project in view of the preservation of the European architectural heritage”. The work started in 2000 and was finished in 2002.

As far as the site along the Scheldt is concerned, the government of the Province of East Flanders decided to develop it into an archaeological park. First of all the excavated foundations of the central monastery complex were consolidated. Even if the foundations of the industrial sector have not been dealt with yet, we can state that the centre of the building complex has been secured provisionally. Special attention was given to a methodology to present poorly preserved and complex remains in an understandable way without the use of physically intrusive reconstructions. This led to the development of the *TimeScope* technology, using

virtual reality heritage presentation on the excavation site itself (Callebaut & Sunderland 1998; Pletinckx et al. 2005). A first prototype was presented to the public in September 1997. The *TimeScope* 1 system superimposes a 3D model of the abbey church over a real-time video shot of the exposed foundations (augmented reality). This allows visitors to see the church *in situ* as it appeared in its original state. An accompanying multimedia presentation offers additional information about the site and the people who lived there.

The *TimeScope* on the site is now history itself. Meanwhile, the technology has been improved and a new *TimeScope* concept for the Saint Laurentius church was installed (Pletinckx et al. 2001). To make the mass of data the investigation of the monument had yielded comprehensible for the public, a story-based system was developed, where the user can influence the course of the story based upon interest and exploration (fig. 7.17). This interactive methodology does not only help to interpret the building history and historical importance of this unique thousand-year-old monument, but also shows the broad public why the church was restored to its original form. This new system was officially inaugurated in the church in July 2004.

The new interpretative and interactive medium was appreciated by the public. In 1997, the *TimeScope* on the archaeological site was awarded the Dutch *Golden Scarabee* prize on the grounds that this new presentation technique had managed to bridge the communication gap between the public and the archaeological

Fig. 7.15: The Provincial Archaeological Museum Ennepe, on the right the Saint Laurentius church.





Fig. 7.16: Ename, Saint Laurentius church. The central axis after the restoration. Striking elements of the east choir (right) are the two altar floors and the triple arcade on the second level with the mural of the *Majestas Domini* on top.

heritage. In that same year the pilot project received the *Flemish Monument Award*. Finally, in 2004, the Time-Scope in the Saint Laurentius church received the *Innovation Prize* from the Dutch Society for History and Informatics.

Finally, there is the *involvement of the local population*, probably one of the most lively results of the heritage activities in Ename (Callebaut 2002). When it was decided to link the excavations up with an intense public outreach programme, the first concern was for the inhabitants of the village. Apart from the traditional approach including guided tours of the excavations, information panels and three newsletters a year, the local population was also involved for example in drawing up the plans concerning the heritage approach in Ename, the activities of the provincial museum of Ename and the upkeep of Bos t'Ename. In 1992, the 'Bos t'Ename task force' was founded to research the woods and to help in the forest management. The group consists of inhabitants of Ename and surrounding villages. They organise the cutting, pruning and cleaning in a traditional way, for example with the help of horses, so that the wood can return to its natural state. All these activities made the local people partners and supporters of the heritage realisations in Ename and proved to be an inspiration for new initiatives stimulating village life. Heritage activities bringing a village closer together: it was an unexpected experience that became a cherished asset of the small-scale initiatives in Ename.

5. International outreach

The ICOMOS Ename Charter

As indicated before, the excavations in Ename initiated a highly developed interdisciplinary investigation that was linked to the public outreach in a structural and innovative way. As the results show, this integration of the study and the opening-up of heritage met an international need concerning the interpretation and presentation of cultural heritage. Various international documents had already mentioned briefly that interpretation plays an important role in heritage care. For example, we refer to the Nara Document on Authenticity (1994), the Burra Charter (1999), the International Charter on Cultural Tourism (1999) and the Principles for the Conservation of Heritage Sites in China (2002). These guidelines all demonstrate how important heritage interpretation is for professional training, site management and heritage tourism, but they do not include a standardised terminology, a clear definition of basic principles and connections with other fields of action or social contexts (Silberman 2005; Silberman 2006). The Ename Center for Public Archaeology and Heritage Presentation (*Ename Expertisecentrum voor Erfgoedontsluiting* or EEC) is a non-profit organisation that was founded in 1998 to do further research on the basis of the heritage experiences in Ename. The center took the initiative to draft a first proposal for a text concerning standards for interpretation and presentation, in col-

laboration with other experts from abroad (<http://www.enamecharter.org>). The text was finished in March 2002. Workshops, public discussions and amendments followed until January 2004, when the Executive Committee of ICOMOS confirmed that the review of the proposal would be undertaken by an editorial group of international experts of ICOMOS and members of the Ename Center. During the 15th General Assembly of ICOMOS in Xi'an, China it was decided to develop the charter even further under the auspices of an International Scientific Committee on Interpretation and Presentation (ICIP). In total 7 drafts were written before the text was officially ratified as the 'Charter for the Interpretation and Presentation of Cultural Heritage Sites', commonly known as the *ICOMOS Ename Charter*, during the 16th General Assembly in Quebec (ICOMOS 2008). The crucial starting point is that interpretation and presentation are structural elements of the general preservation process of cultural heritage: interpretation as the entirety of activities that leads to a better understanding and appreciation of cultural heritage and presentation as a carefully planned communication of the insights that were gained. From this point of view, the ICOMOS Ename Charter puts forward 7 principles (Liuzza 2008):

1. *Access and Understanding*, refers to both physical and intellectual access, whose aim is to enhance personal experience, create connections with the site and increase public respect and understanding. Moreover, understanding should be addressed demographically and culturally, taking into consideration the different audiences and also different cultural sensibilities which might require restriction to uses and interpretation on site.



2. *Information Sources*, refers to the necessity of inclusion in all interpretative programmes of information from scholarly research, but also from living cultural traditions. These sources should be accessible to the public and archived for future reference. Finally, alternative historical hypotheses and traditional storytelling should be incorporated through participation of members of associated communities.
3. *Context and Setting*, refers to the wider social, cultural, historical and natural contexts that should be considered in interpretative programmes. This includes the contributions of different historical periods and cultural groups, but also the natural and intangibles elements as well as the cross-cultural significance of a heritage site.
4. *Authenticity*, refers to the importance for interpretative structure to respect the traditional social functions and cultural practices of a cultural heritage. So every effort should be made to avoid irreversible alterations to the physical structures and disturbance to the life of local residents.
5. *Sustainability*, refers to the potential negative effects of interpretative programmes and infrastructure on the natural and cultural environment of the site. It stresses the importance of a rationale planning to ensure effective and regular maintenance of the infrastructures and equitable benefits to all the stakeholders.
6. *Inclusiveness*, refers to the fact that interpretative programmes should be the result of active participation between scholars and heritage professionals and stakeholders and associated communities. This means also multidisciplinary approach to research and inclusion of public involvement in expansion and revision of the interpretative programmes, with particular attention to intellectual property and traditional cultural rights issues.
7. *Research, Evaluation and Training*, refers to the necessity of a continuous revision, review and assessment of any interpretative programme, which should never be considered the final interpretation of any cultural heritage site. In this process all the stakeholders should be included and training should be considered as a dynamic and continuous activity in formal and informal learning.

The final aim of the ICOMOS Ename Charter is to develop a process that converts heritage sites into places of reflection on the past, into an inspiration for sustainable community development and intercultural and intergenerational dialogue (Silberman 2009). The further activities in Ename were planned along these lines. We have two examples:

In 2007 and at the suggestion of the Flemish minister Dirk Van Mechelen, all the heritage realisations in Ename, including the Bos t'Ename, were awarded the *European Heritage Label*. The purpose of this label is to "enhance the value and the profile of sites which have played a key role in the history and the building of the European Union, and seek to increase European citizens' understanding of the building of Europe". Reflections on Europe's past, community development and intercultural dia-

Fig. 7.17: The TimeScope in the west choir of the Saint Laurentius church.

logue: a basic principle that can be found in the ICOMOS Ename Charter and is given a European perspective in the label awarded to Ename itself.

The Francia Media project

The international architecture of the Saint Laurentius church (see above) and its links with Aachen and Ravena drew the attention to *Francia Media*, the Carolingian Middle Realm, which goes back to the heritage of Charlemagne's impressive empire. The territory contained early medieval Europe's most important north-south route that linked the Mediterranean with the North Sea as far as culture, communication, technology and economy were concerned. Because this territory had never been studied synthetically before and never had been made known to the public via exhibitions or publications, the Institute for the Archaeological Patrimony and the Ename Center for Public Archaeology and Heritage Presentation took the initiative to start a comprehensive research and public programme on *Francia Media*, in collaboration with other European partners.

Early in 2010, the European Commission selected the *Francia Media project 'Cradles of European Culture'* within the framework of the Culture 2007–2013 programme. The Institute for the Protection of Cultural Heritage of Slovenia is the project leader, while the Ename Center for Public Archaeology and Heritage Presentation focuses on the contents. The project begins on 1st November 2010 and ends on 30th October 2015. It starts from the historical case study *Francia Media* and intends, through a cooperation between heritage partners of 10 European countries, to highlight the importance of Europe's geocultural past in the functioning of contemporary European society. It also aims at linking the processes of identity creation, the sense of belonging and the intercultural dialogue to the valorisation and understanding of the remains of our past.

The different fields of study (archaeology, history, art history, architecture, cultural landscapes, heritage interpretation and tourism) will compliment a research agenda, structurally stimulated by the participating heritage institutions. The importance of *Francia Media* for modern day Europe will be shown to the public on the basis of this investigation. Several different types of media tools (publications, brochures, catalogues, DVD, website) will be used to report on the activities of the project. The most important of these are the international exhibitions that will be organised in the period 2010–2015 and the development of the *Francia Media* route. The sites are chosen by the following criteria: the site has a transnational importance for European culture; the heritage is scientifically studied and interpreted; the opening-up is professional. The result is that the selected sites are indeed real 'Cradles of European Culture', and together form a prize pilot project to implement the principles of the ICOMOS Ename Charter in a structural way.

6. Conclusion

As far as Ename is concerned, the notion of 'large-scale excavations' does not really refer to the size of the area, but rather to the depth and the innovative approach of the investigation. And these were caused by the starting point: the study of occupation and defence in the

valley of the Scheldt, a truly thematic investigation programme.

This starting point made it insufficient only to collect archaeological data, to analyse them technically, to put the material in a chronological framework and to interpret the foundations. The question was a much broader one, and essentially focused on giving significance to what had been excavated. To realise this, historical sources had to be reviewed critically, architectural-historical and natural scientific research had to be intensively involved in the archaeological work, and, as far as the pottery finds were concerned, large-scale research on a regional basis had to be linked to the development of new research methods.

The investigation programme in the Scheldt region led to a holistic vision on the local heritage of Ename, in which the archaeological, monumental and environmental patrimony were considered to be an integrated entity that made a better understanding of the past possible. In its turn, this created a new challenge: how can we bridge the gap between research and the public? New paths were followed with the building of an innovative provincial museum, **pam**Ename, and the development of new presentation techniques, with the attention for a restoration concept that returned to the Saint Laurentius church its former glory in a scientifically well-founded way and with attention to the involvement of the local population. The results were such that they formed the basis for formulating a first proposal concerning regulations for interpretation and presentation. In 2008, the ICOMOS Charter for the Interpretation and Presentation of Cultural Heritage Sites was finally ratified in Quebec. The commonly used name ICOMOS Ename Charter shows the respect for the site where it all began.

Thematic excavations that lead to international regulations: it is a remarkable story that only goes to show how, by taking the step from the local to the global level, it becomes clear that a sensible and proper preservation of heritage can only be possible when that patrimony is interpreted and made significant, and the insights acquired are presented in a correct way. Also preventive archaeology will have to take into account this worldwide-accepted statement if it wants to justify the many funds for the preservation of the archaeological heritage *ex situ*.

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8 | L'opération archéologique sur le tracé de la ligne à grande vitesse en Wallonie et plus particulièrement entre Hélécine et la frontière allemande. Premiers apports et interprétations

Heike Fock et Hélène Remy

Résumé : Les travaux d'infrastructure de la ligne ferroviaire à grande vitesse qui traverse la Wallonie ont suscité les premières interventions d'archéologie préventive sur tracé linéaire réalisées par le Service public de Wallonie. Pour la première fois aussi, de telles interventions ont bénéficié d'un financement de l'aménageur, en l'occurrence le Groupe SNCB.

L'analyse porte sur l'évolution du fonctionnement et le déroulement des interventions depuis 1993, l'apport de la démarche interdisciplinaire et les résultats archéologiques. Les opérations archéologiques ont abordé des régions diverses dont le passé reste, pour certaines, peu connu.

Ce sont les recherches menées entre Hélécine et la frontière allemande, entre 1995 et 2003, qui sont principalement considérées : l'occupation rubanée en région hesbignonne, un premier aperçu de l'exploitation du minerai de fer durant l'époque romaine dans l'Est de la Belgique, ainsi que des éléments clarifiant l'évolution des habitations dans le Pays de Herve.

Les données présentées reflètent l'avancement des études engagées, notamment dans le cadre d'une vaste exposition itinérante axée sur des thématiques ciblées. Les résultats ont déjà permis d'orienter la planification d'autres opérations linéaires ou extensives dans ces régions.

Introduction

Le tracé du TGV en Wallonie et le cadre institutionnel

La construction de la liaison à grande vitesse traversant la Belgique a suscité la mise en place de programmes archéologiques spécifiques liés au caractère linéaire des travaux. La Wallonie s'y est engagée dès 1993 : la première étape dite « occidentale » fut réalisée entre la frontière française et Tubize, sur quelque 72 km ; la seconde se définit par le tracé « oriental » qui s'étend depuis Hélécine jusqu'à la frontière allemande, soit sur quelque 65 km de ligne en site propre (fig. 8.1).

L'ensemble du projet met en évidence la complexité de la gestion des compétences en matière de fouilles archéologiques, réparties entre les Régions wallonne, flamande, bruxelloise et la Communauté germanophone. Le tracé oriental est à ce titre révélateur puisqu'il touche les communes de la Région wallonne en ce compris celles en territoire de la Communauté germanophone, qui a décidé de confier l'opération TGV à l'équipe wallonne.

Le tracé oriental de la ligne à grande vitesse jouant sur la frontière linguistique entre Hélécine et Liège, le projet archéologique a également occasionné un partage d'expériences entre les archéologues des Régions wallonne et flamande. Ainsi, la cohérence des opérations conduites sur ce tracé favorise l'étude scientifique transversale des découvertes.

Le fonctionnement et le financement

En Belgique, les législations relatives aux fouilles de prévention n'obligent pas les aménageurs à financer les sauvetages archéologiques. Dans ce sens, l'intervention financière du Groupe SNCB pour l'opération préventive faite en Wallonie est une référence.

Le partenariat avec l'aménageur se présente sous forme de conventions fixant le déroulement de l'opération, des études préalables à la diffusion et publication, ainsi que le budget octroyé. Celui-ci consiste en un montant forfaitaire lié au kilomètre du tracé, qui de 24 800 euros pour la partie occidentale a été augmenté à 34 705 euros pour la partie orientale.

La programmation des travaux archéologiques a suivi celle des travaux d'infrastructure, alors liée aux demandes des permis d'urbanisme. De façon générale, le découpage des travaux ferroviaires en projets, puis en secteurs a conditionné les fouilles archéologiques, de même que les modifications d'emprises et la définition des zones connexes d'aménagement connues progressivement. Les spécifications techniques imposées comme les limites de profondeurs, les tris des terres et les obligations ou non de rebouchage, ont parfois dû être rediscutées en cours d'opération avec Tuc Rail, la filiale chargée du projet TGV.

Concrètement, la SNCB s'engageait à mettre des terrains expropriés à la disposition des archéologues. Ceux-ci devaient ensuite établir, dans un délai fixé à trois mois, la liste des terrains libérés de toute contrainte archéologique et pointer les sites nécessitant une intervention complémentaire. Dans ce cas, de nouveaux délais étaient fixés en concertation.

Mais le projet archéologique TGV étant aussi une réalisation de l'Administration de la Région wallonne, le fonctionnement de l'opération est nécessairement soumis aux règles de gestion administrative et budgétaire. Le budget de l'opération est défini annuellement et vise l'ensemble des actions sur le terrain, tant les

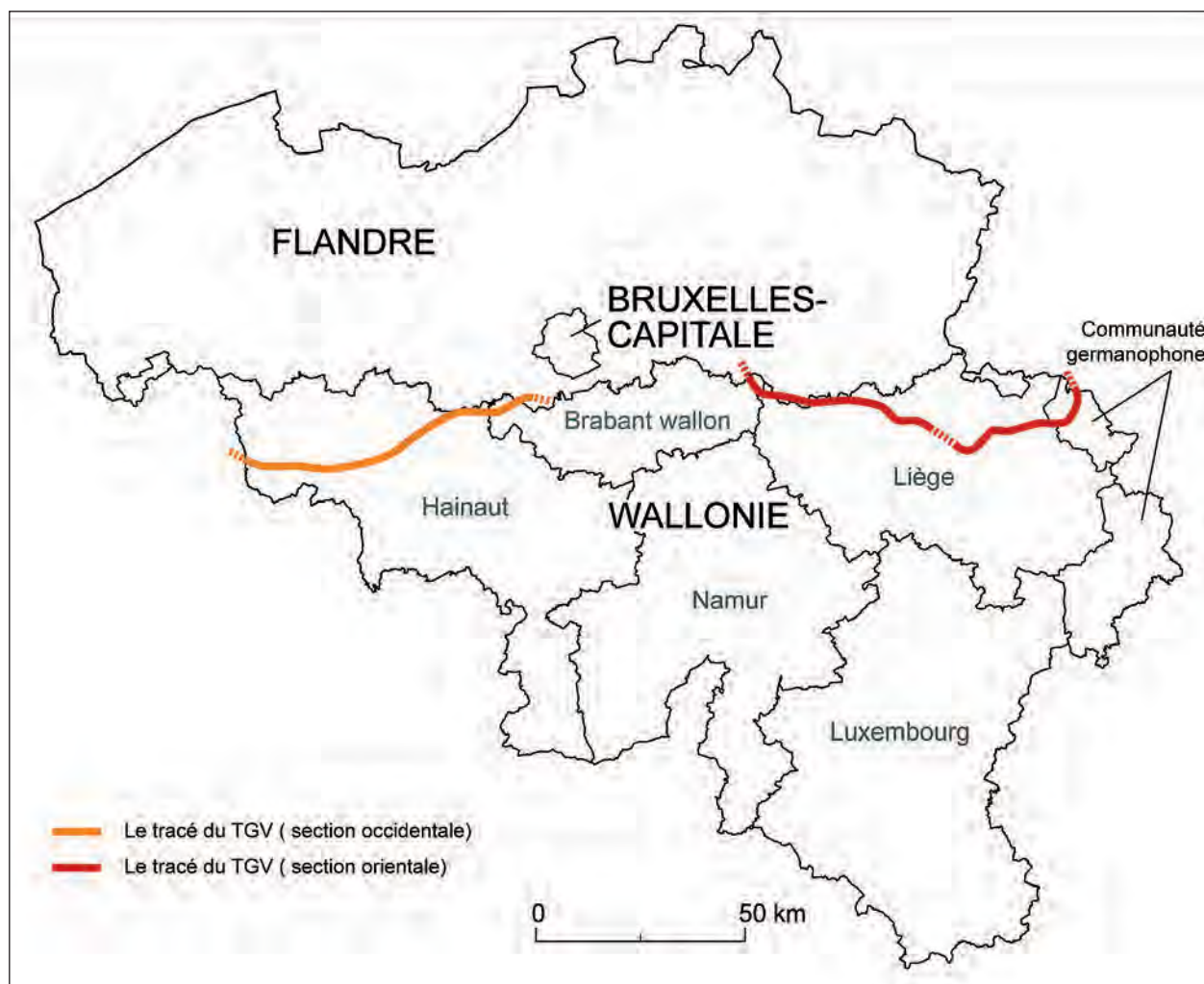


Fig. 8.1 : Les tracés de la ligne à grande vitesse en Wallonie (infographie F. Cornélusse, © SPW).

sondages-diagnostic que les fouilles. Le bon déroulement de l'intervention dépend évidemment aussi des moyens humains mis à disposition, inégaux dans le cas des deux tracés.

La Région wallonne a voulu intégrer la démarche pluridisciplinaire dans ce projet, en finançant des partenariats avec des universités et institutions spécialisées. Ainsi, dès le début des opérations sur le terrain, des spécialistes du paléoenvironnement ont contribué à l'étude et à l'interprétation des vestiges et des contextes.

Le souci constant de maintenir une bonne coordination du projet archéologique et les excellents rapports entre l'aménageur et les archéologues ont favorisé les opérations sur le terrain. Les études entamées en témoignent.

Les données archéologiques connues avant les interventions et les apports de celles-ci

L'expérience occidentale

Le déroulement de l'opération occidentale et appréciation

L'opération sur le tracé « occidental » a été pionnière : une première d'envergure sur un tracé linéaire et un financement de la part de l'aménageur, la SNCB (Remy & Soumoy 1996).

Pour permettre d'engager l'opération, l'aménageur demandait un atlas des risques archéologiques comme outil de concertation. Celui-ci résumait les résultats des études documentaires et des prospections pédestres. Parallèlement, l'aménageur souhai-

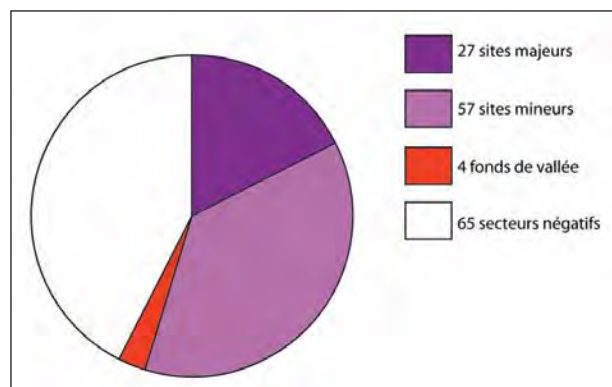


Fig. 8.2 : Graphique de répartition des secteurs et sites étudiés sur le tracé occidental du TGV (infographie F. Cornélusse, © SPW).



Fig. 8.3 : Le site protohistorique du « Bois d'Attre » à Brugelette/Arbre : la zone circonscrite par les fossés d'enceinte (photo prise par ballon captif, P.-P. Sartieaux, © SPW).

Les prospections pédestres conduites sur ce tracé occidental ont été déterminantes, puisqu'elles ont permis de repérer un tiers des sites importants. Cette analyse témoigne de l'intérêt de telles prospections menées dans des conditions optimales (accès des terrains, état, nombre de passages ...).

L'intervention archéologique a été réalisée de janvier 1993 à mars 1995. Pour ces 27 mois de travail, 60 personnes ont été engagées avec un minimum de un an de présence sur le terrain. Les spécialistes du paléoenvironnement ont renforcé les équipes.

tait disposer de la liste des parcelles dites prioritaires pour les fouilles, afin de gérer au mieux la succession des expropriations et de permettre une intervention rapide des archéologues sur des terrains libérés. La notion de l'importance des « zones vides » n'était, à ce stade, pas perçue. Ainsi, en début d'opération, les sondages-diagnostic ont d'abord été pratiqués essentiellement sur des sites repris à l'atlas cité, dans le but d'en définir l'extension et d'orienter les fouilles. Au fur et à mesure de l'avancée de l'opération, la multiplication des terrains disponibles a occasionné des évaluations systématiques sur plusieurs kilomètres, amenant ainsi des découvertes sur des zones archéologiquement inconnues jusqu'alors. Selon les cas, les évaluations ont consisté soit en tranchées en quinconce sur une maille de 10 m, soit en tranchées continues généralement espacées de 20 m.

Pour apprécier les étapes de l'intervention menée, on retiendra que pour les 72 km de tracé continu, 91 zones sensibles ont été répertoriées à l'atlas des risques. Ces zones s'inscrivent dans un total de 153 secteurs d'importance et longueur variables, qui ont été accessibles pour les sondages-diagnostic (fig. 8.2). Au terme de la phase diagnostic, 88 zones archéologiques ont été identifiées, qui ont livré 27 sites importants auxquels s'ajoutent les résultats récoltés sur les sites de 4 fonds de vallée. La moyenne est ainsi de 1 site tous les 2,3 km (Remy & Soumoy 2002).

Quelques résultats de l'opération hennuyère

La découverte de quelques 21 occupations protohistoriques concentrées sur 20 km, entre Péruwelz, Brugelette et Ath, constitue un des apports importants des fouilles pratiquées sur le tronçon occidental. Parmi ces occupations, on dénombre 11 sites majeurs avec notamment les habitats fossoyés de Brugelette et de La-deuze (fig. 8.3). Quelques autres traces de cette période relevées dans des emprises proches complètent cet inventaire ; le matériel livré par l'ensemble des sites souligne le caractère régional des occupations. Dans cette zone aussi, de nombreux réseaux de fossés témoignent d'une structuration partielle du territoire.

Si la probabilité de nouvelles découvertes semblait forte à proximité immédiate du site d'Aubechies, *Coron Maton*, connu comme un des plus importants habitats du Néolithique ancien du Hainaut, seuls quelques indices rubanés y ont été récoltés et ce n'est qu'à quelque 1000 m de là qu'un nouvel habitat du Néolithique ancien a été mis au jour, à Ath/Ormeignies, *Le Pilon* (Livingstone Smith, à paraître).

De même, on pouvait s'attendre à des données relatives à l'Antiquité tardive sur le tracé dans le Tournais méridional, mais seuls des rares indices ont été livrés par une occupation à Brunehaut, Jollain-Merlin. Enfin, le gisement du Mésolithique ancien du *Spinoi*, repéré lors des sondages systématiques menés à Rebecq,



Fig. 8.4 : Le découpage du projet oriental (infographie F. Cornélusse, © SPW).



Fig. 8.5 : Sondages en Hesbaye (photo C. Goffioul, © SPW).

à l'extrémité orientale du tracé, est une découverte exceptionnelle (Bosquet 2010).

L'expérience orientale

Le déroulement de l'opération orientale et appréciation

Le projet dit oriental a profité de l'expérience hennuyère. Le tracé totalise 65 km et comporte deux tronçons, que l'aménageur a gérés en quatre projets, soumis chacun à un permis d'urbanisme conditionnant les délais et le calendrier des expropriations (fig. 8.4).

Le tracé oriental est caractérisé par la traversée de deux paysages fondamentalement différents au niveau géologique et pédologique : la Hesbaye, à l'ouest de la vallée mosane (fig. 8.5), et le Pays de Herve, à l'est (fig. 8.6). L'occupation actuelle du sol, champs d'une part et pâtures de l'autre, en témoigne et reflète les activités respectives de ces régions. Ces caractéristiques expliquent les résultats inégaux livrés tant par les études documentaires que par les prospections préalables. En effet, les études préliminaires menées sur les territoires de Soumagne, Herve et Welkenraedt ne renseignaient quasi rien et les prospections au sol étaient inopérantes dans ces zones de prairies.

Grâce aux concertations avec l'aménageur, l'évaluation mécanique a été développée sur toute l'emprise du tracé oriental, indépendamment des données archéologiques connues reprises à l'atlas des risques. Dans ce sens, les découvertes faites sur le tronçon à l'est de Liège témoignent à l'évidence de l'importance de la prise en compte des « zones vides ».

De façon générale, les archéologues ont opté pour le système des sondages en damier avec une maille de 10 m, réalisés par lot de terrains d'emprise disponibles, ce qui a amené un découpage arbitraire du tracé en 149 secteurs. L'analyse des résultats récoltés par secteur devait permettre de sélectionner et de cibler les sites à fouiller, mais cette démarche « idéale » fut dans quelques cas entravée par la lenteur des expropriations et les changements d'emprise connues tardivement.

En Hesbaye, les 36 km de tracé en territoire wallon représentent 77 secteurs de fouilles d'importance et de longueur variables définis selon les accès disponibles aux emprises (fig. 8.7). La phase diagnostic a permis de définir 49 secteurs positifs comprenant 21 sites qui ont livré des données importantes. Sur les 29 km en Pays de Herve, 72 secteurs ont été envisagés dont 32 positifs ; 9 bâtis et 7 sites majeurs y sont à retenir (Fock et al. 2008). Au total, les 37 occupations ciblées sur



Fig. 8.6 : Sondages en Pays de Herve (photo C. Goffioul, © SPW).

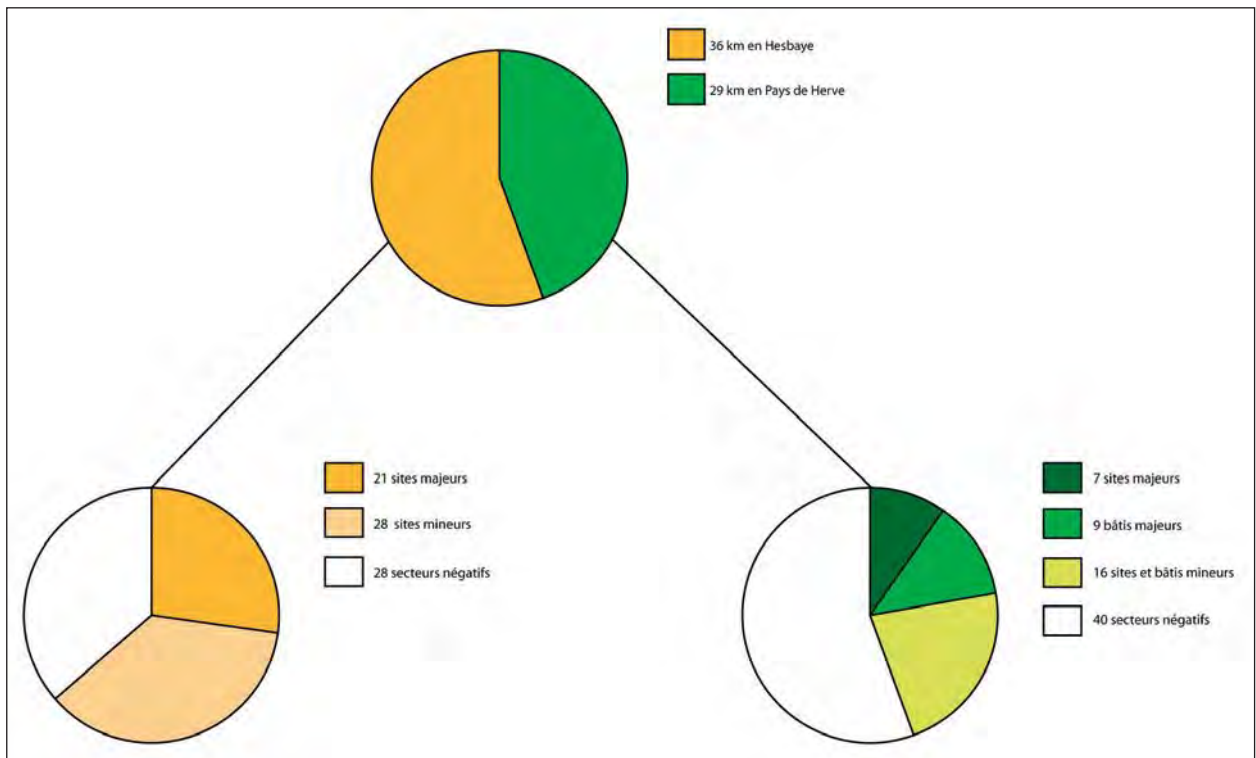


Fig. 8.7 : Graphique de répartition des secteurs et sites étudiés sur le tracé oriental du TGV (infographie F. Cornélusse, © SPW).

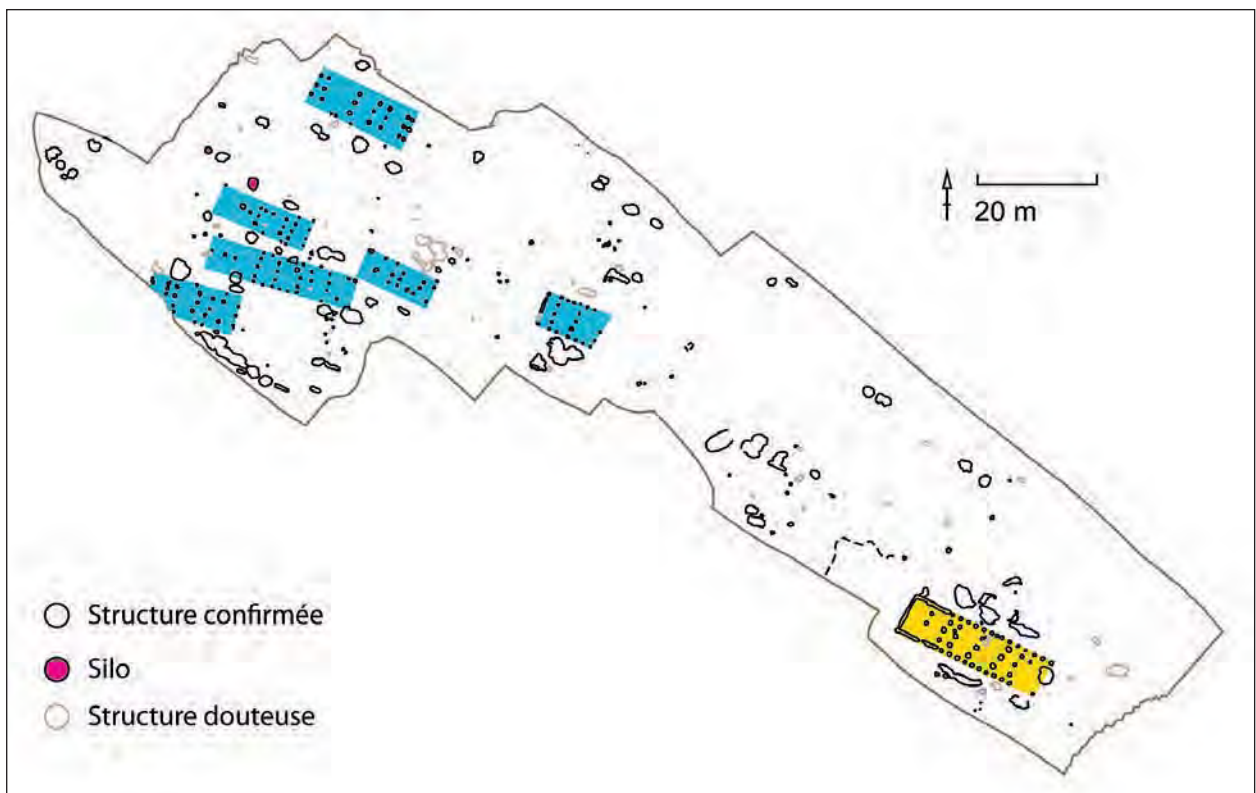
l'ensemble des 65 km donnent une moyenne de 1 site tous les 1,8 km.

La Région wallonne a affecté à l'opération orientale une équipe comptant en moyenne quelque 4 archéologues (dont un administratif), 3 techniciens et 8 opé-

rateurs, et à laquelle ont été associés les spécialistes du paléoenvironnement.

Ainsi, les contraintes de l'aménageur et de l'administration ont conditionné la succession des phases archéologiques. L'intervention s'est déroulée de façon

Fig. 8.8 : Plan du site rubané de Fexhe-le-Haut-Clocher, *Podri l'Cortri* (infographie A. Van Driessche, © SPW).



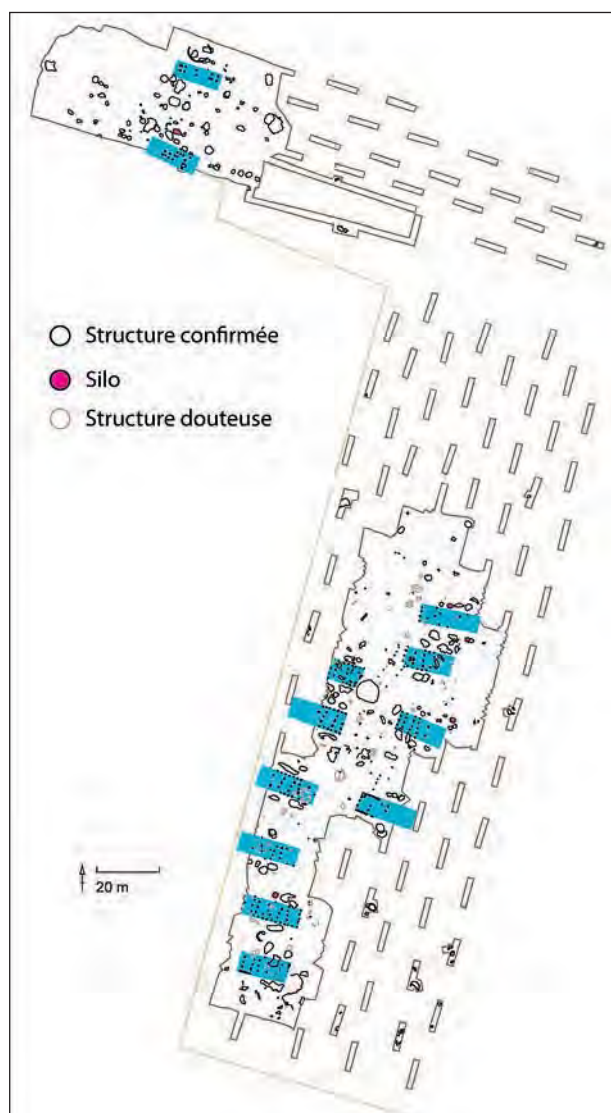


Fig. 8.9 : Plan du site rubané de Remicourt, Momalle (infographie A. Van Driessche, © SPW).

intermittente entre juillet 1995 et novembre 2003, comptabilisant 101 mois de travail sur terrain.

Quelques résultats de l'opération en Hesbaye et en Pays de Herve

L'occupation rubanée en région hesbignonne

Le tracé du TGV à travers la Hesbaye s'inscrit dans la bande limoneuse de la Moyenne Belgique, un terrain de choix pour les premiers groupes d'agriculteurs venant de l'Europe centrale vers 5150 av. J.-C. L'occupation rubanée de cette région faisant l'objet de recherches depuis plus d'un siècle, près de 200 sites sont repérés par prospection pédestre, mais seule une petite trentaine a été soumise à des fouilles extensives. Dans ce contexte, les six nouveaux habitats découverts sur le tracé du TGV apportent de nom-

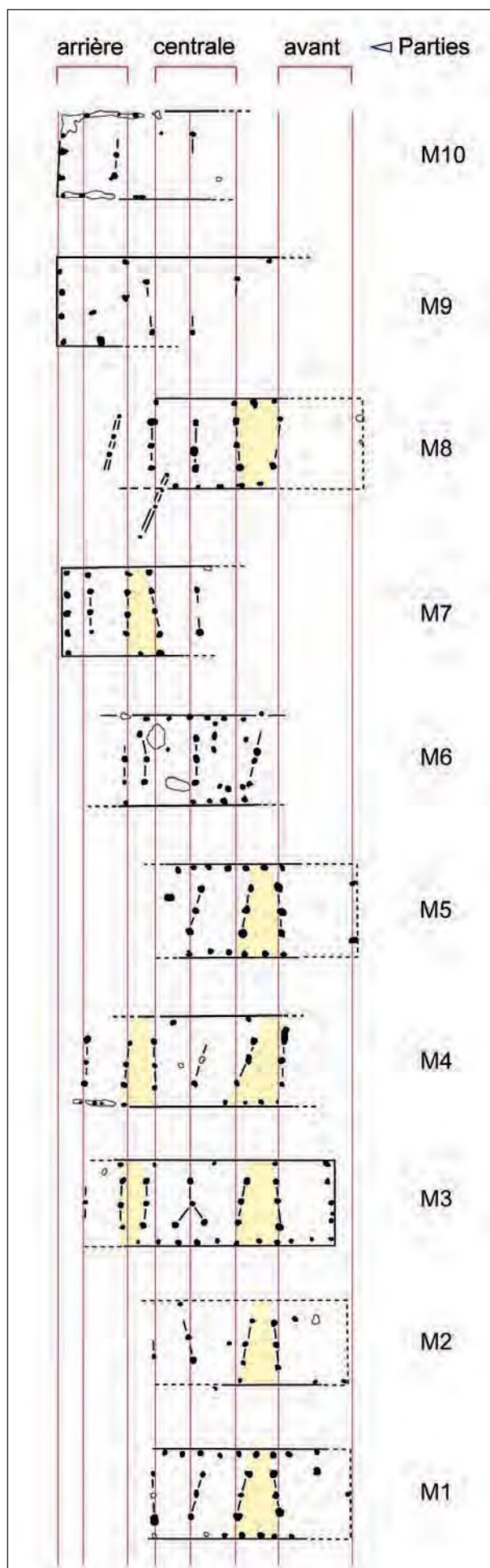


Fig. 8.10 : Diagramme comparatif des dix maisons du secteur oriental de Momalle. Établi sur base du rythme des tierces, il révèle une uniformité étonnante du module central, alors que la superficie des espaces arrière et surtout avant varie légèrement (infographie C. Régimont, © SPW).

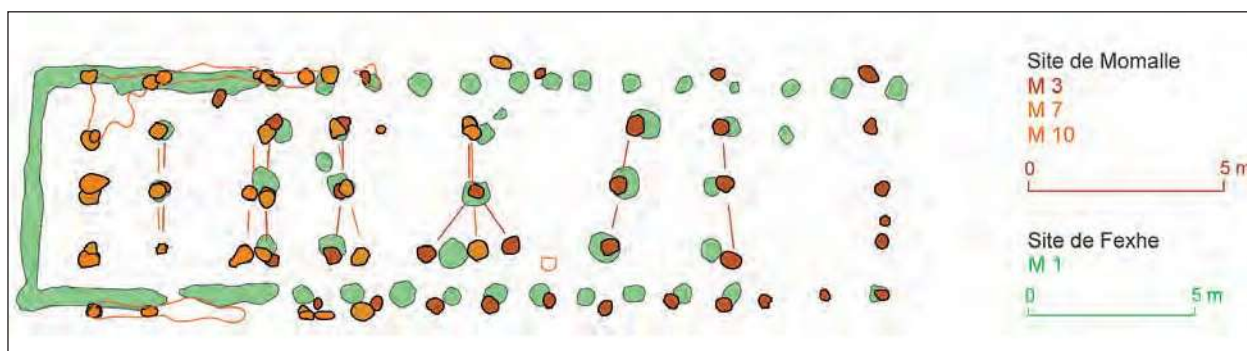


Fig. 11 : Comparaison entre le plan de la maison « idéale » de Momalle et celui de la maison isolée de Fexhe (infographie C. Régimont, © SPW).

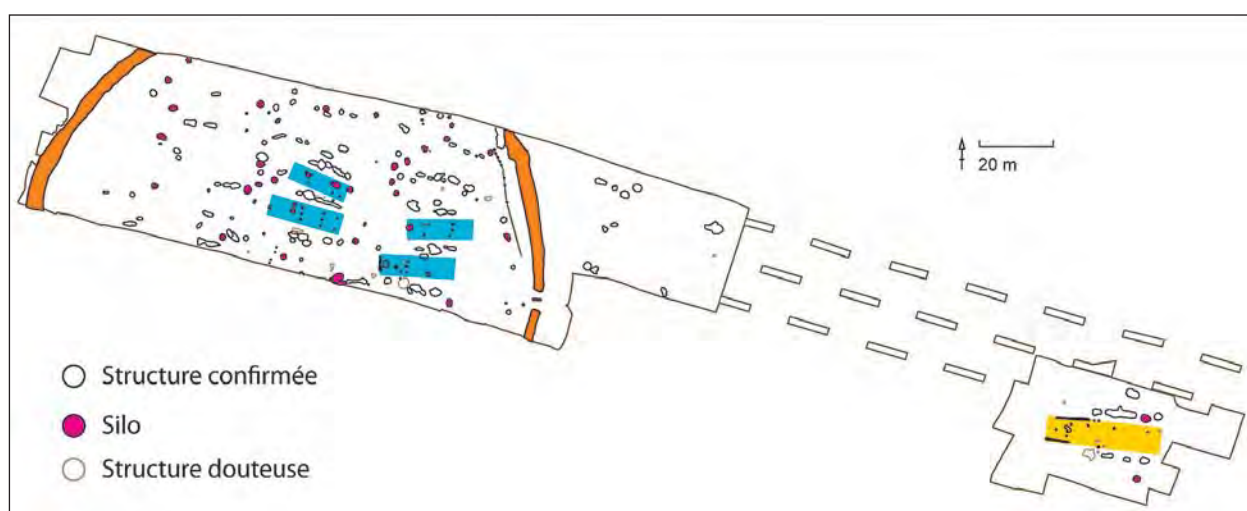


Fig. 8.12 : L'habitat de Remicourt, *En Bia Flo* se distingue par le nombre élevé de silos repérés, 43, alors que les autres sites rubanés ne livrent que 1 ou 2 silos par maison (infographie A. Van Driessche, © SPW).

breuses d'informations intéressantes (Bosquet et al. 2004).

Si les évaluations systématiques menées sur le tracé du TGV ont pu confirmer le rôle joué par le Geer en tant que limite pour cette occupation rubanée, c'est la nature et la récurrence de certaines structures particulières qui permettent de dégager de nouveaux axes de recherches. Parmi ces structures, citons d'abord la maison dite « isolée » (fig. 8.8), située à l'écart de l'établissement proprement dit et en dehors de l'enceinte fossoyée qui en entoure certains. Aux deux maisons déjà connues des sites de Waremmes et de Darion s'ajoutent actuellement deux nouveaux individus repérés sur le tracé du TGV, à Remicourt et à Fexhe-le-Haut-Clocher, données qui fournissent un corpus propice aux études transversales. La prospection magnétique entreprise sur les surfaces non fouillées autour des quatre sites a déjà confirmé le caractère exceptionnel de ces maisons, l'analyse n'ayant révélé aucune autre habitation excentrée (Quick et al. 2005 ; Bosquet et al. 2007). L'étude comparative du matériel céramique et lithique, toujours en cours, semble démontrer l'ancienneté des maisons isolées par rapport à l'habitat proprement dit. Les résultats des analyses anthracologiques suggèrent que ces



Fig. 8.13 : Grande jarre parfaitement conservée ayant servi de dépôt de fondation à Voroux-Goreux (photo L. Baty, © SPW).

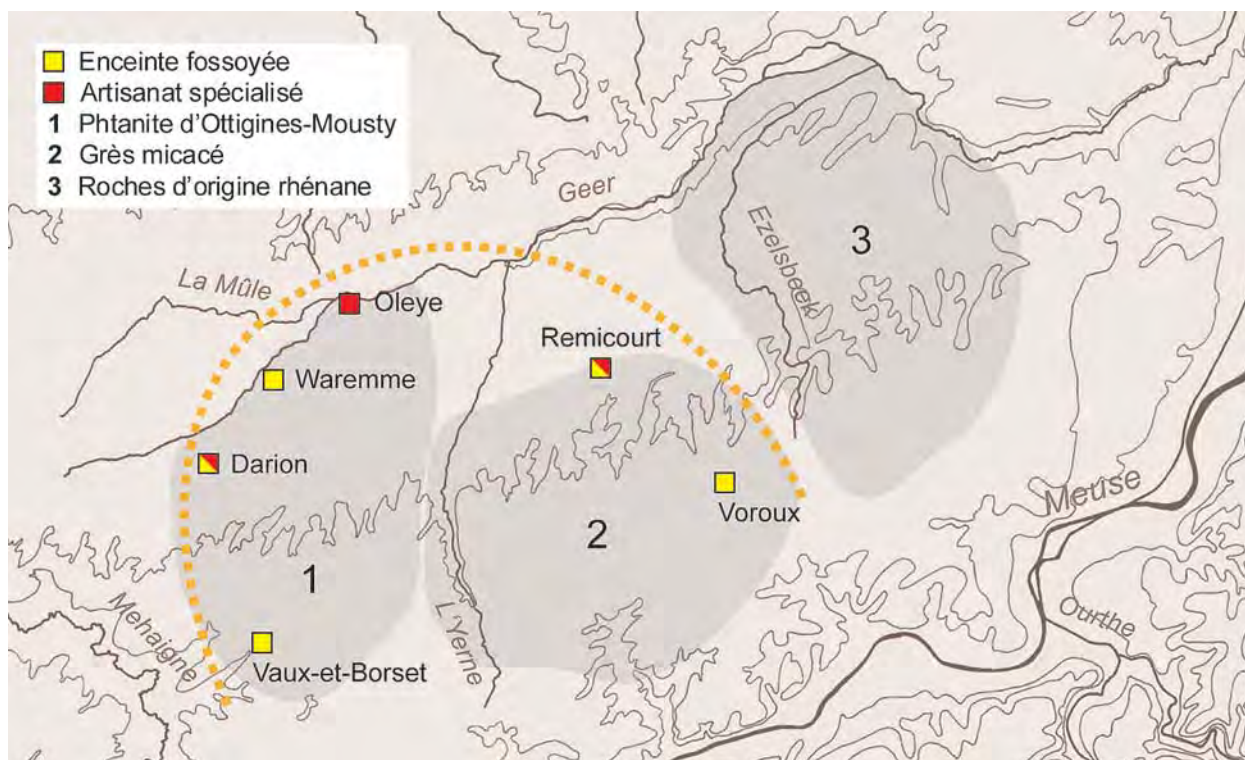
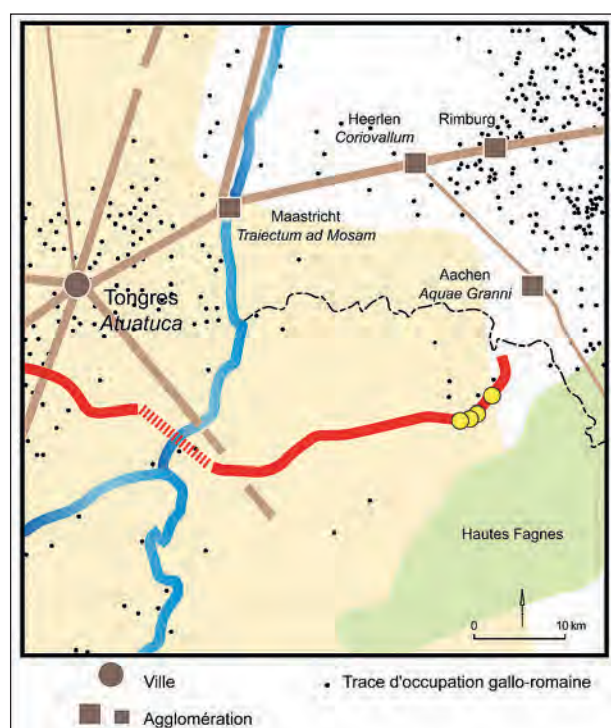


Fig. 8.14 : Dans l'aire délimitée, les Néolithiques exploitent majoritairement deux roches locales pour la fabrication de leurs herminettes, alors que dans les sites découverts en dehors, l'utilisation des roches d'origine rhénane est plus fréquente (infographie A. Van Driessche, © SPW).

maisons sont érigées alors que la forêt atlantique est toujours présente, les habitats étant, par contre, édifiés dans un milieu plus ouvert et dégradé, caractérisé par les héliophiles et les essences buissonnantes (Salavert 2008). Ce faisceau d'indices nous pousse à interpréter les maisons isolées comme appartenant à une étape pionnière de la colonisation rubanée (Bosquet et al. 2008).



Cette hypothèse pourrait cependant être nuancée voire remise en question par l'analyse de l'habitat de Remicourt, Momalle (Fock et al. 1998) dont les études viennent d'être entamées. En effet, les 10 maisons formant la limite orientale de cet établissement (fig. 8.9 ; 8.10) ont livré un corpus céramique qui, au niveau typo-chronologique, est comparable voire antérieur à celui trouvé dans les maisons isolées. Le matériel lithique, quant à lui, n'est que rarement fabriqué à partir du silex gris de Hesbaye, le matériau dominant dans les habitats. Mais c'est surtout l'architecture qui crée un lien indéniable entre l'habitat de Momalle et la maison isolée de Fexhe, située à moins de 2 km. En effet, en construisant la maison « idéale » de Momalle à partir des plans les mieux conservés, on obtient une habitation de proportions identiques à celles de la maison de Fexhe (fig. 8.11). Des plans à ce point standardisés supposent l'existence d'une unité de mesure commune ainsi que la transmission d'un schéma de construction. Si l'étude anthracologique pour le site de Momalle devait révéler un environnement forestier similaire à celui de la maison isolée de Fexhe, il faudra voir dans quelle mesure la chronologie relative de ces deux entités pourra être affinée et, en conséquence, dans quelle mesure l'hypothèse d'une phase pionnière devra être nuancée. Un deuxième axe de recherches est consacré aux enceintes fossoyées qui entourent certains habitats rubanés (fig. 8.12). La typo-chronologie de la céramique, les analyses carpologiques et radiocarbone entamées confirment que ces enceintes doivent être asso-

Fig. 8.15 : Carte de répartition des traces d'occupations d'époque gallo-romaine à l'est de la vallée mosane (© M.-H. Corbiau et Relevés d'empreintes, exposition Euregio).



Fig. 8.16 : À Lontzen, *Krompelberg*, la conservation exceptionnelle des traces liées à la réduction du minerai a permis de reconstituer la chaîne opératoire développée pour cet atelier et de l'illustrer par une maquette (maquette E. Dewamme ; photo L. Baty, © SPW).

ciées à la fin de l'occupation rubanée. Les aménagements découverts sur le tracé du TGV, à Remicourt et à Voroux-Goreux, sont similaires : fossé partiellement doublé d'une palissade, entrée séparée en deux par une « *Schlitzgrube* », fossé au profil caractéristique en « V » et creusé avec un soin extrême, achèvement de l'ouvrage consacré par un dépôt de fondation, placé au fond du fossé, à hauteur de l'entrée (fig. 8.13). Le dépôt de Remicourt, formé de deux petites meules placées de part et d'autre de l'entrée, est particulièrement significatif puisqu'il semble renvoyer à une spécialisation de l'habitat dans le traitement de céréales. Une spécialisation en artisanat, notamment la taille du silex ou la fabrication de la céramique, a déjà été observée sur d'autres sites fouillés le long du Geer. Malgré la vue partielle dont nous disposons actuellement de l'occupation rubanée, on remarque que ces établissements fortifiés et/ou spécialisés se répartissent en arc de cercle, délimitant une micro-région d'environ 400 km² adossée à la vallée mosane (fig. 8.14). On pourrait ainsi admettre que le territoire rubané s'est réduit peu à peu, juste avant la disparition complète de cette civilisation, et que ses occupants y ont exploité autant que possible les ressources les plus proches.

Un premier aperçu de l'exploitation du minerai de fer durant l'époque romaine dans l'Est de la Belgique

Le tracé du TGV traverse un ancien territoire gaulois intégré à l'Empire sous le nom *Civitas Tungrorum*. Si l'occupation de la Hesbaye à l'époque romaine est bien connue et documentée par de nombreuses fouilles, nos connaissances sont extrêmement lacunaires pour la région située à l'est de la vallée mosane, entre la limite orientale de la *Civitas* et les Hautes Fagnes (fig. 8.15). La découverte de deux habitats romains sur cette partie du tracé fut dès lors surprenante ; celle de deux ateliers de réduction de minerai de fer constitue même une première. L'implantation des deux sites d'artisanat doit être mise en relation avec les riches gisements métallifères de la région dont l'exploitation s'est poursuivie jusqu'au siècle dernier.

L'atelier de Lontzen, *Krompelberg* est en activité entre 110/120 et 150/160 apr. J.-C. (fig. 8.16). L'infrastructure comprenant à l'origine un seul bas fourneau est ensuite dotée de deux bas fourneaux jumelés dont l'utilisation

alternative – l'un fonctionnant, l'autre étant en phase de maintenance – permet aux métallurgistes d'optimiser la production. Les seconds bas fourneaux sont installés dans une vaste fosse préalablement tapissée d'une argile blanche de type kaolinite, un aménagement indéniablement censé améliorer la rentabilité de l'équipement : le grand pouvoir réfractaire de l'argile blanche ralentit la dégradation des parois du fourneau et simplifie donc l'entretien nécessaire après chaque opération de réduction. La même évolution technique a pu être observée pour le second atelier découvert sur le tracé du TGV à Baelen, *Corbusch* (fig. 8.17), où d'ailleurs le même type de minerai, la goethite, est transformé. Mais, malgré ces cohérences, les procédés de fabrication divergent visiblement d'un atelier à l'autre. Ainsi, la goethite est directement réduite à Baelen, mais d'abord grillée à Lontzen, ce qui permet d'éliminer l'excédent en eau et, par conséquent, de faciliter le concassage et de raccourcir le temps de réduction dans le bas fourneau. L'analyse comparative des chaînes opératoires, des vestiges, des résidus ainsi que l'analyse archéométrique de ces derniers promettent dès lors d'être passionnante, surtout si grâce à de futures découvertes, cet embryon d'étude de la paléométallurgie pouvait être élargi à un cadre régional, voire transfrontalier. Ainsi, d'après la masse de scories collectée sur les sites TGV, la pro-



Fig. 8.17 : Site de Baelen, *Corbusch*. Vue en plan d'un des bas fourneaux installés dans une fosse tapissée d'argile blanche (photo D. Bosquet, © SPW).



duction des ateliers devait répondre au moins à des besoins locaux, voire contribuer à l'approvisionnement d'agglomérations voisines comme *Aquae Granni*, située juste au-delà de la limite de la *Civitas*.

Des éléments clarifiant l'évolution des habitations dans le Pays de Herve

Le paysage caractéristique du Pays de Herve ne s'est formé qu'à partir du 16^e siècle, sous les pressions politiques et économiques entraînant une économie d'élevage. Les paysans sont obligés de transformer leurs champs en pâturages et vergers, et un nouveau type d'habitat se crée petit à petit : la ferme isolée, ceinturée de prairies encloses de haies (fig. 8.18). Ce type d'architecture a déjà fait l'objet d'une monographie (Pays de Herve 1987), toutefois strictement basée sur l'étude de maisons et de fermes encore occupées. La



Fig. 8.18 : Paysage typique du Pays de Herve (photo C. Goffioul, © SPW).

destruction d'une dizaine de fermes sur le tracé du TGV fut dès lors l'occasion de décortiquer intégralement certaines constructions, sélectionnées sur base de leur développement volumétrique et de leur présence sur des cartes anciennes. Ainsi, un pignon primitif en pans-de-bois préservé comme mur de refend a pu être relevé dans trois bâtiments dont l'apparence ne laissait pourtant plus suspecter la conservation de phases anciennes ; une quatrième ferme conservait même les deux pignons originaux autorisant une reconstitution du volume initial de l'habitation (fig. 8.19). La datation dendrochronologique permet de situer les colombages dans la première moitié du 17^e siècle.

Les quatre noyaux primitifs cités présentent des similitudes évidentes : même fonction de logis, même profondeur de bâtiment, même quasi-absence d'un sous-bassement censé isoler le pan-de-bois de l'humidité ascensionnelle, même subdivision interne en trois niveaux, même inclinaison des toitures à 45°. Toutefois, le logis ne semble pas s'accoler, dès sa construction, à une étable logée sous le même faite – état pourtant énoncé comme caractéristique de la ferme hervienne traditionnelle. Au contraire, l'étable sous fenil indispensable dans une exploitation vouée à l'élevage n'apparaît que lors d'une seconde phase d'aménagement et la cave abritant la laiterie, lors d'une troisième, voire d'une quatrième. Ces indices suggèrent un développement nettement plus lent et plus complexe que supposé jusqu'à présent pour ces fermes et, par conséquent, pour l'économie d'élevage du ban de Herve entre le 16^e et le 18^e siècle.

Conclusion

Les premières interprétations proposées dans le cadre de l'exposition thématique citée (Fock et al. 2008) seront réévaluées et complétées par les études des 37 sites majeurs du tracé oriental qui feront l'objet de publications exhaustives.

La masse d'informations récoltées sur les tracés enrichit l'inventaire archéologique et contribue d'ores et déjà à mieux cibler les problématiques et à orienter les investigations menées à proximité du tracé TGV : tracés routiers et gazoducs, lotissements et vastes zones d'activité économique ... Il importe aussi que la publication et la diffusion de ces données puissent alimenter les futurs projets de recherches et favoriser le développement de programmes spécifiques.

L'opération préventive sur ce tracé ferroviaire à travers la Wallonie a évolué au cours des années. Elle a été marquée par une adaptation aux différentes conditions et circonstances, par l'expérience acquise progressivement. C'est pourquoi la qualité de certaines données pourrait se révéler inégale. Il reste que la richesse des découvertes engrangées est à la hauteur des investissements.

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Fig. 8.19 : Reconstitution du noyau ancien de la ferme dite Peiffer à Thimister-Clermont (maquette H. Fock ; photo L. Baty, © SPW).

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9 | Large-scale preventive excavations in Hungary

Katalin Wollák and Pál Raczky

The situation in Hungary until 1990

Similarly to other regions in Europe, Hungary also had to start adapting to the changes that started at the beginning of the 1990s. One of the important elements in this process was that following over 40 years of operations in a state-controlled legal environment, Hungarian archaeology had to find its place within an ever-changing free market economy. This also meant that the expected professional standards had to be met amidst increasing pressures of extensive fieldwork. This situation was related with the underdeveloped state of the road network in Hungary and the international expectation that Hungary be an integral part of the pan-European traffic system, the so-called Helsinki Corridors (fig. 9.1).

Within the framework of this project, the 350 km long motorway system in 1989 had to be significantly expanded. Moreover, following the transition, a new challenge was posed by private industrial developers. Archaeological preparation for this type of rescue work required a new approach, significantly different from previous practices. New expectations had to be met by the institutions created in the old system. These included museums at each of the country's 19 counties and its capital, to some extent the Hungarian National Museum (hereafter National Museum) – previously in charge of archaeological excavations nationwide –, universities with departments of archaeology and the Archaeological Institute of the Hungarian Academy of Sciences (hereafter Academy Institute). Previously, however, these institutions had carried out centrally funded, planned excavations. At the beginning of the 1990s, some 200 archaeologists were employed by the network of county museums (Jankovich & Nagy 2004, 38). According to common practice, the

majority of those carried out excavations on surfaces of some hundreds of square meters; their field experience lay in projects within this scale.

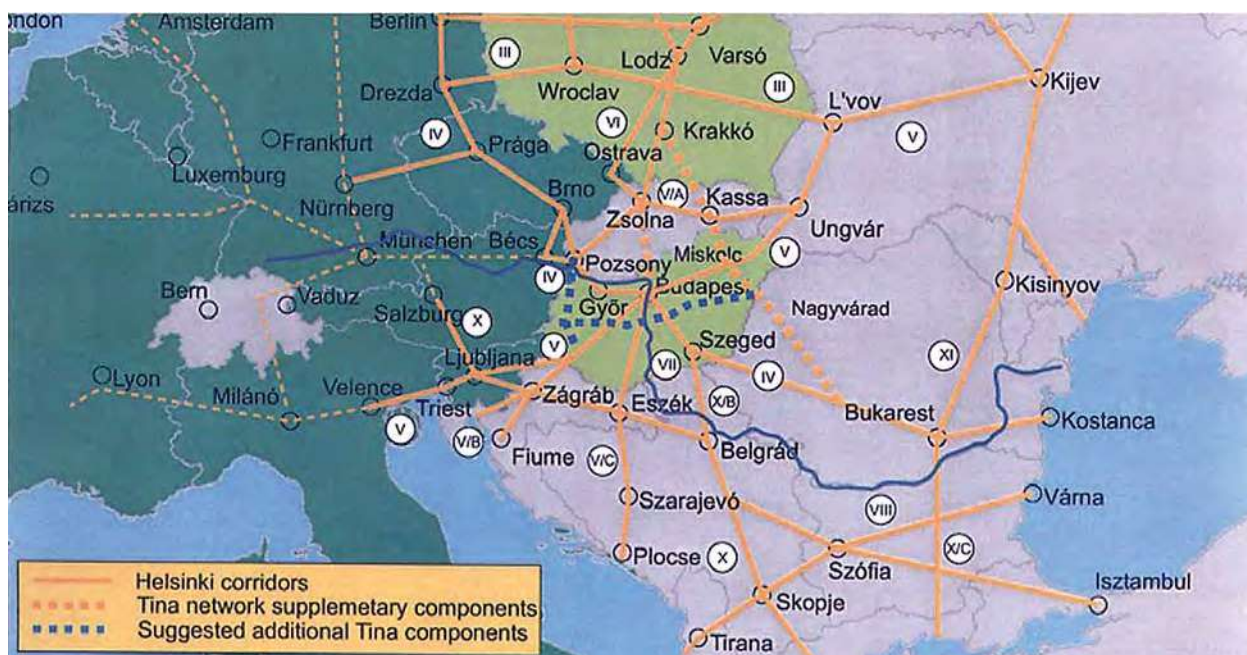
Large-scale archaeological projects of the past era

Expertise in working over large surfaces was limited to a few excavations that tended to continue for decades, such as the project of the Fejér County Museum at the Roman Period settlement of Táp-Gorsium, where work was going on for 40 years. Projects of comparable dimensions were carried out by the National Museum at the Copper Age site of Tiszalúc and the Academy Institute at the Late Neolithic settlement of Aszód-Papi földék. The Institute of Archaeological Sciences of the Eötvös Loránd University in Budapest (hereafter University Institute) carried out research on Roman Period settlements in the Zalatölve area.

According to Article 9/1963, a legal regulation valid until 1997, the costs of preventive excavations related to large, state-run investments enjoying a preferential status had to be covered from the budget of the state investment. In reality, however, excavation duties were not always fulfilled. A 1975 publication by the National Museum already called for “rescuing our vanishing archaeological wealth” (Körök 1975). This wording shows that although the extent of destruction was known, no infrastructure was in place to systematically protect archaeological sites except for a few that enjoyed a special, protected (scheduled) status.

Positive examples include rescue work related to the immense industrial development at the “socialist city” of Dunaújváros (the former village of Dunapentele that

Fig. 9.1: Helsinki corridors.



grew into the city of Sztálinváros), where industrial sites and housing projects were accompanied by proper archaeological preparation (Vékony 2003; Ernyey 2003). One of the first examples of planned preventive excavations was the archaeological project that preceded the construction of the Tisza II hydroelectric works at the beginning of the 1970s. An area of 5–11 km width was thus uncovered at a length of 40 km before the construction of a water reservoir. The area was partially covered by field walks carried out by the National Museum. Although not all 55 sites thus mapped were chosen for excavation, an area of 60,000 m² was investigated during the course of a decade (Korek 1974; Jankovich 1993).

Target-oriented and well-coordinated preventive excavations were also carried out at a section of the Danube River that forms the border between Hungary and Slovakia. A hydroelectric complex was planned in the Bős/Gabčíkovo – Nagymaros region of the river. Beginning in 1977, a systematic site exploration program that affected three counties was coordinated by the National Museum. The methodology of the topographic research program¹ carried out by the Academy Institute could be profitably used in locating and evaluating sites along the banks of the Danube Bend gorge, densely inhabited from prehistoric times to the Middle Ages and beyond.

Sites mapped in the Esztergom area were even included in Volume 5 of the *Archaeological Topography of Hungary* devoted to Komárom County, published in 1979. The aforementioned dense inhabitation of this region is convincingly illustrated by the 30 km long section of the Roman *limes* along the riverbank between Esztergom and Nagymaros. Three military camps were found within this short distance, in addition to a chain of 23 watchtowers located at a distance of 600 m from each other. The aims of the large-scale excavations initiated at six locations in 1978 did not simply include rescue work in the area to be inundated by the river. They also had the ambitious plan to write a settlement history of “unparalleled dimensions” of the peoples who once inhabited the banks of the Danube (Fülep 1979). Several teams worked side by side, excavating surfaces of several hundred square meters simultaneously. Aside from such “green field” developments in open areas, large surface recovery was far less characteristic, for example in densely inhabited urban areas.² No detailed inventory was made of the archaeological structures destroyed during the course of these constructions. Given the small number of sites uncovered, however, it may be presumed that archaeological rescue work was ignored in the case of numerous dam constructions and hydroelectric installations as well as during mining activities (Makkay 2005). Small-scale developments were even less monitored for archaeological impact.

Development and aims of the La Valletta Convention

Similar tendencies also became apparent in other European countries inducing the birth of a new international organization. Instead of the failed XIth congress of UISPP, another conference was held in Southampton, England, in 1986. It was entitled “Public Archaeology and Cultural Resource Management” and may be regarded as the first conference of what later became the World Archaeological Congress (WAC). Processes impacting on archaeological heritage following World War II were among the main topics of that meeting.

The wealth of cultural and archaeological heritage was discussed in terms of cultural resource management, sustainability and protection (Cleere 1989). The need to efficiently offset damaging factors has led a group of archaeologists in Western Europe to initiate the renewal of the 1969 convention of the European Council (European Convention on the Protection of the Archaeological Heritage). Subsequently, a separate committee dealing with archaeological heritage was created within ICOMOS, called International Committee on Archaeological Heritage Management (ICAHM). By 1990, this committee developed its own recommendations in the form of a targeted charter (ICOMOS Charter for the Protection and Management of the Archaeological Heritage; Trotzig 2001; Trotzig 2003; Willems 2007). These processes have eventually resulted in the Council of Europe convention (European Convention on the Protection of the Archaeological Heritage [Revised] 1992), which essentially changed the approach to the preservation of the archaeological heritage. This so-called La Valletta Convention has made it widely accepted that anthropogenic changes in the environment – whose imprint may be followed in elements of the archaeological heritage – represent a value worth protecting, similar to that of the natural environment. Cultural resources preserved in the form of archaeological sites need to be protected in their original state. They can only be investigated using scientific techniques, and such research needs to be carried out under properly controlled circumstances. Efforts will have to be made to incorporate information on archaeological heritage into investment and development already during the phase of planning. The ‘polluter pays’ principle was a decisive element – lifting this wording from the language of environmental protection – and the convention was signed by 20 European countries, including Hungary, in 1992 and adopted by another 18 countries. All countries involved drafted a new model of financing archaeology induced by the activity of developers. The guiding principle was that costs should be covered by those who have a vested interest in interfering with the integrity of the archaeological site.

Preparatory steps towards large-scale excavations

In spite of the fact that the majority of developments were state investments at the time, the situation in Hungary was similar to that in Europe, since no systematic preventive excavations were carried out preceding these developments. The first 7 km section of a motorway in Hungary was built during the 1960s.³ Archaeologists learnt about two sites in Pest County and another on the territory of Fejér County in the first stage of the construction of the Motorway M7 between Budapest and Lake Balaton. However, a coherent strategy of comprehensive preventive excavations was lacking even during the mid-1980s. The situation was similar along the path of Motorway M1 built between Budapest and Vienna. In this latter case, rescue excavations at an Avar cemetery of several hundred burials had to be carried out during the course of the construction itself (Jankovich 1997; Makkay 2005). In fact, plans concerning the public road network in Hungary have not significantly changed during the past 70 years. Given the central location of Budapest, the web of major roads has been laid out in a radial system. The development of public roads began in the Western half of the



Fig. 9.2: Length of motorways built in Hungary between 1964 and 1989.

country and continued with the construction of Motorway M3 towards the East (Budapest–Gödöllő 1980) and Motorway M5 running towards the southern border (Budapest–Újhartyán 1985). However, until 1989, the total length of motorways had not even reached 350 km (KSH; Raczky 2007) (fig. 9.2).

The first surveys, including field walks, were carried out in the Budapest–Gyöngyös section of Motorway M3, designed to link the capital with Miskolc and Nyíregyháza respectively. This work was, however, carried out within the framework of the project “Archaeological Topography of Hungary” during the 1980s. Due to the scarcity of archaeological sites in this section, no major rescue excavations had to be carried out. A major breakthrough followed beginning with the 1990s when the Győr–Hegyeshalom section of Motorway M1 was investigated. All 23 sites located in the affected area were excavated, although the consistent conservation and analysis of the find material did not follow (Jankovich 1997). The changing circumstances also required different attitudes from the institutions involved. Whether it was state investments or private developments, due to the lack of a proper legislative background, the expenses had to be covered by individual settlements with the firms involved; the completely excavated area had to be handed over by strict deadlines. Excavations were carried out simultaneously at various sites, requiring a radically different infrastructural background both in terms of professional archaeologists, technical staff, equipment and other material resources. This situation was compounded by the pressures of accelerated fieldwork that impacted upon archaeological techniques. This included the mechanized removal of top humus layers, usually mixed by modern tillage, whose find materials (lacking the original archaeological context anyway) usually had to be abandoned. The Budapest History Museum has played a pioneering role in adapting to the new expectations. As a result of cooperating with the Museum of London Archaeological Services, they developed a code of practice for contract archaeology in the capital during the 1980s. Archaeological recovery was integrated within the process of investments and special attention was paid to veritable documentation as well as publishing reports after each excavation. In addition to the role played by the Archaeological Topography of Hungary in the elaboration of the preparatory phases of the large-scale excavations, the so-called microregional projects, initiated by the Academy Institute during the mid-1980s, are worth mentioning (Bökönyi

1992; Bökönyi 1996). Within the framework of these projects, comprehensive studies of the natural environment and settlement history were investigated in well-defined areas including archaeological surveys, test excavations as well as relevant research in natural sciences.

The first phase of large-scale excavations: 1990 (1987)–1997

Archaeological work related to the development of the motorway system

For the first time, systematic archaeological research was carried out preceding the construction of Motorway M1 in the surroundings of Győr in Northwestern Hungary. The Győr–Moson–Sopron County Museum employed six archaeologists and subsequently built up a technical staff consisting largely of contracted personnel (Jankovich & Nagy 2004, Table 26). During the field campaigns that began in 1990, the techniques of both excavation and documentation had to be renewed. Quantities of information had to be retrieved and stored during the course of these rescue excavations that reached “industrial dimensions”. The number of features ran into several thousands at numerous sites, and relevant information had to be retrieved, stored and analyzed. Early on the Academy Institute joined this field project in order to support – with its proper logistical and (natural-)scientific background – the complex excavation work required for the historical interpretation of various archaeological periods. An efficient database had to be chosen and developed that could simultaneously handle pictorial and textual information as well as the spatial (GIS) representation of archaeological sites (Csáky & Figler 1995). This application, however, required digitizing elements of the field documentation. In addition to excavation logbooks, this meant the processing of site plans, profile drawings, photographic documentation. This need arose from the fact that the number of archaeological features to be documented and analyzed multiplied by several orders of magnitude.⁴

The new wave of constructions that began in the 1990s posed a similar challenge for the 19 county museums and the Budapest History Museum in charge of municipal development in Budapest. Initial projects included Motorway M0, the bypass around Budapest where excavations were joined by the Budapest History Museum in 1987. Pioneering institutions were soon joined by the



Fig. 9.3: M3 motorway: selection of sites presented on the 1997 exhibition.

museum of Bács-Kiskun County, where the first phase of professional “motorway archaeology” was stimulated by the construction of Motorway M5 in 1987/88. Four sites were discovered within the designated construction area during field walks aimed at determining the archaeological implications of the project. In addition, partial preventive excavations were carried out at two quarries to be opened in connection with the construction. The area thus investigated totaled 10,000 m². The size of this surface significantly exceeded the few hundred square meters routinely excavated. Tasks related to documentation, conservation and analysis, therefore, multiplied. In fact, by 1988 excavations had to be extended to the quarries that later supplied gravel for the motorway construction (Somogyvári 2007).

Somewhat later the Csongrád County section of the same motorway was continued during 1991/92. As the first step, the Csongrád County Museum organized field walks in cooperation with the University of Szeged. In addition to data published in the archaeological literature, they also relied on the maps prepared during the First Military Survey ordered by Emperor Joseph II of the Habsburg Dynasty (1763–1787). In certain places, maps on a scale of 1:28,800 dating from the Second Military Survey (1826–1866) were taken into consideration as well, in addition to known topographic and hydrological features and results of aerial photography (Szalontai 2003). The 48 km long section of the motorway in Csongrád County yielded over 100 sites in a 500 m wide band. 61 of these fell directly within the path of the planned motorway or the 50 m zone running along either side. Excavations, however, began only two years later in 1993; in the absence of tight deadlines, 17 sites could be uncovered. This was followed by an almost three years break, as the Hungarian government temporarily refrained from developing motorways in the immediate proximity of war-struck former Yugoslavia (Szalontai 2001). Development was resumed only in 1998. During the first phase of preventive excavations the museum could single out only relatively few sites for recovery. Therefore other sites, identified within the 30–50 m zone along the path could not be investigated unless their existence was reconfirmed during field walks. During the second phase of excavations, however, it turned out that many of these sites overlapped with the path itself. Moreover, no archaeological work was planned in the areas under overpasses and traffic junctions. Also ignored were areas of those sites where the lack of tillage precluded field walks and no horizontal distributions of artifacts brought to light by plough-

ing could be appraised. Test excavations at potential sites were not carried out either, despite the fact that subsequently – during the construction – the archaeological relevance of such territories was confirmed.

In summary it may be said that excavations were carried out at a lower intensity with a limited staff. No uniform excavation and documentation protocols were available and on-site conservation was likewise missing. Meanwhile, work began on the Gyöngyös–Miskolc section of Motorway M3, and prevention reached an additional 175 km towards the east, spanning four counties (Heves, Borsod-Abaúj-Zemplén, Hajdú-Bihar, Szabolcs-Szatmár-Bereg) (fig. 9.3).

Challenges, problems and new approaches

This situation posed yet another challenge to practitioners in the field, it required a previously unseen coordination. Part of this task was taken up by the University Institute, having recognized that both field surveys and excavation methodology needed to be improved (Raczky et al. 1997). These new methods should more reliably predict the size of surfaces to be excavated as well as the spatial frequency of archaeological sites. Given these parameters, excavations will be more easily planned both in terms of time and space, not to speak of finances. This program was attended by archaeologists in four county museums, the University Institute and the Academy Institute, as well as the National Museum in addition to a number of foreign institutions (Museum für Vor- und Frühgeschichte, Frankfurt am Main; CNRS, Glux-en-Glenne; Universities of Durham and Newcastle upon Tyne). The so-called Upper-Tisza Project was also related to the motorway excavation series. In the context of this intensive field survey program a framework for sampling site deposits was elaborated, contributing significantly to modernizing methodologies of both survey and analysis in Hungarian archaeology (Chapman 2002; UTP 2003). This project has also proven that data from rescue excavations (to use the relevant legal term of that time) provided *bona fide* archaeological information. With proper foresight and following appropriate preparation, such data could be treated exactly the same way as those originating from systematic, planned scientific excavations. This new view of archaeology gained strong support from a series of natural scientific studies that were carried out with special care both during field surveys and excavation. Within the framework of these programs, major development took place at the University Institute, where a laboratory devoted to spatial informatics was established that also contained a valuable archive of aerial photographs. On

this basis, a model integrating geophysical, spatial, and aerial photographic information could be developed (Raczky et al. 2002). Excavations between 1993 and 1996 covered a 100 m-wide band along a 175 km distance of Motorway M3. This surface yielded 150 sites, sometimes requiring research over 30,000–40,000 m² large territories. It should be considered exemplary that results of this project were presented to the public one year after its accomplishment. Archaeological material from 21 of the most significant sites was exhibited in the National Museum in 1997. This exhibition was then taken to the centers of the four counties involved. The catalogue was published by the time of the Budapest exhibition. Subsequently, the outstanding assemblages of this exhibition were also presented in Bougon (France) and Frankfurt am Main (Germany). In addition to the lists of artifacts exhibited, the catalogue contained analytical articles that evaluated the results from the Neolithic to the late Middle Ages and described the roles played by natural sciences in the project (Raczky et al. 1997; Jankovich 1997).

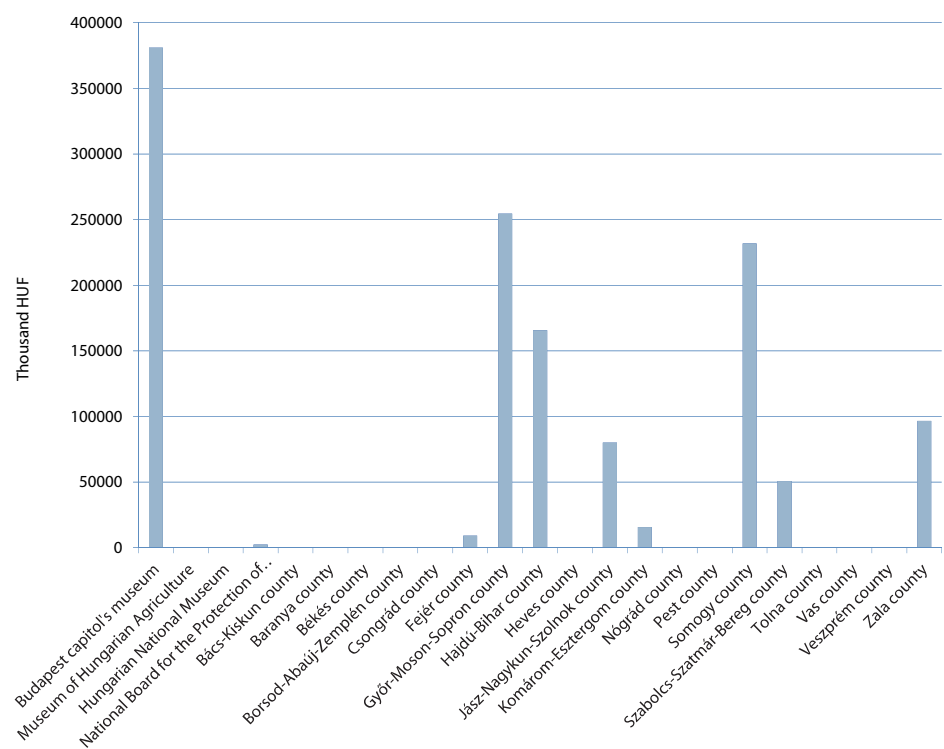
Between 1964 and 1989, some 350 km of the public road system were built in Hungary including motorways (KSH 1990). However, as was mentioned previously, archaeological excavations were carried out only occasionally during this construction work. A major change for the archaeological profession followed at the beginning of the 1990s. Although only 126 km of motorway have been conveyed between 1990 and 1997 (KSH 1997), the scheduling, technology and programming of archaeological excavations were developed during this formative period. Reviewing the problems identified during this first phase of accelerated construction beginning with the 1990s, the following characteristics are worth considering:

1. Until 1997, *legislation* did not follow the new requirements. No legal guidance was developed for the preparatory work and there were but minimal regulations concerning financing. These were, however, insufficient in preparing an institutional system for a task that would have required renewing the entire

discipline. One of the fixed points was the aforementioned La Valletta Convention; although the entry into force was in Hungary in 1995 (enacted in separate legal decree in 2000), that convention did not become part of the Hungarian legal system until 1997.

2. In the eyes of *planners, investors and developers*, archaeology often seemed the inevitable evil that could stand in the way of motorway constructions. Although the inauguration of newly accomplished sections has always represented considerable political capital to the ministers in charge (e.g. in the case of Motorway M3), the pace of development has been hectic. No mechanism was available that would have facilitated integrating the knowledge of archaeological heritage within the planning process. Preparing large-scale investments was characterized by the lack of regulations. Consequently, at the beginning developers did not insist on systematic preventive field surveys. The paths of motorways were sometimes arbitrarily changed and the locations of auxiliary facilities (such as petrol stations) and gravel extraction quarries were frequently not negotiated with archaeologists. In case of developments that included multiple players (investors/developers), the cooperation was difficult, seriously hindering planned and systematic excavations.
3. According to the investors, *excavation budgets* were not transparent, archaeologists supposedly charged too much. Indeed, the work to be covered by developers was not clearly itemized and the costs of excavation were often decided by individual bargaining. Frequently, the prices thus agreed upon did not cover the post-excavation costs, the indispensable processing of the archaeological information “rescued”. A problem typical for the 2000s began emerging: counties (i.e. county governments) – through county museum’s budget – involved in the projects used their newly acquired resources in other areas of museum development, rather than the proper financing of preventive excavation projects (fig. 9.4). Some of the

Fig. 9.4: Expenses turned to preventive archaeology done by the county museums between 1989 and 1999 (Jankovich & Nagy 2004, 79.)



tasks financed by county museums were necessary at the time, but became superfluous. In addition, many counties began parallel developments of their own (e.g. promoting a variety of digitizing schemes). Due to the resulting diversity, the finds and relevant field information could not be managed by standardized criteria (Jankovich 1997; Raczky 2007).

4. At this point the archaeological profession was confronted with new challenges that it has been ill-equipped to deal with until today. These included the principle that “*everything be excavated*”, which precluded the development of *sampling, site selecting methodologies*, although field directors were often forced to make arbitrary selections of what could be recovered.⁵ Considering the *increase in size* of excavated areas (some excavations preceding the construction of Motorways M3 and M0 exceeded 400,000 m²), the *conservation and permanent storage* of the tons of resulting find materials becomes a real issue. The 19th century headquarters of prestigious county museums simply could not accommodate the masses of finds they were supposed to deal with.
5. Difficulties of permanent museum storage were not helped by *culling* the assemblages, the methods of the field documentation and final *inventorying* of the finds were not compatible. No accredited *central authentic database* was available for the registration of the archaeological sites, although documentation could no longer be solved without massive development in information technology (Rezi 2003). *Excavation methodology* had to be revised as tasks could no longer be performed without carefully planned team cooperation. Vertical coordination included overseeing fieldwork by technical staff and those operating heavy machinery (mechanized humus removal sometimes caused massive loss of finds as well as field information).

Adaptions in legislation and efforts towards standardization of procedures

Given these problems, changing the legislative environment became inevitable. The first step in this direction was made seven years after the political change in Hungary when Law 140/1997 was implemented. The aim of this legislation was to ensure that the professional-scientific archaeological activities in archaeology should remain the task of museums and other institutions authorized to carry out excavations. This legislation also raised certain processes – such as excavation licensing, supervision and the creation of a new, central database of archaeological sites – to a central management level with the establishment of a new directorate in 1998 (Cultural Heritage Directorate). It was charged with the aforementioned administrative functions and made responsible for archaeological heritage management (Nagy 2003; Wollák 2007a). The principles of the La Valletta Convention became an essential part of the Hungarian regulation: the act introduced the ‘polluter pays’ principle, so the costs of the necessary rescue excavations – using a new expression: investment-led, preventive excavations – namely the excavation, documentation, primary conservation, and storage should be financed by the developer, who must provide at least 9 thousandth of the investment for these purposes.

In addition to creating a new legal environment, the methodology of preparing and conducting these excavations had to be developed. There was a pressing need for such standards as increasing archaeological capacities became tied down in large-scale preventive excavations induced by motorway constructions spanning several counties. It became evident that coordination was a need for veritable professional representation and predictable partnership on the sides of both developers and excavating archaeologists. The development of such methods began during the preventive excavations of Motorway M3 that crossed four counties. The effort was spearheaded by the University Institute. The methodology covered field surveys, the preparation of excavations, field techniques and documentation. The system of these new methods was integrated into a standardized protocol.

Drafting such a protocol was strongly supported by the National Motorway Public Company established in 1999.⁶ This was a closed stock-holding company of 100 % state ownership, put in charge of the nationwide development of the motorway and road networks (railroad development was added to this list in 2007). State bids had to be fulfilled in a market environment, therefore this firm has a vested interest in controlled and predictable archaeological preparatory work. The aforementioned methodological protocol, therefore, was integrated into its working routine as one of the operational phases during motorway construction. Developing the new system of preventive archaeology posed a special challenge to the University Institute, the institution involved in training most archaeologists in Hungary. Unexpected returns, however, soon became evident in education and methodological research as these rescue excavations were conducted over extensive areas and the immense amount of data called for new techniques of data storage, as well as for new types of working schedules and the systematic application of various analytical techniques (Raczky 2008).

Protocol for preventive excavations

The uniform protocol used in preparing archaeological excavations has crystallized during the course of several construction phases in the last ten years as well as during the course of continuous archaeological work. This, in essence, includes archaeological field survey, i.e. the localization of archaeological sites as well as mapping their horizontal extent and vertical stratigraphy, accompanied by dating. The following six phases of this program form a single logical unit:

1. The preliminary phase is aimed at creating a comprehensive spatial database, suited for integrating and evaluating general topographic data, parameters of the planned motorway and various levels of archaeological information.
2. The analysis of entries in archaeological archives from the regions affected by motorway construction, in combination with data from literary sources, is aimed at verifying the precise positions of known archaeological sites.
3. Aerial photography, which is of help in assessing sites using special cameras, is also aimed at surveying subterranean archaeological phenomena (fig. 9.5). In order to gain a better understanding



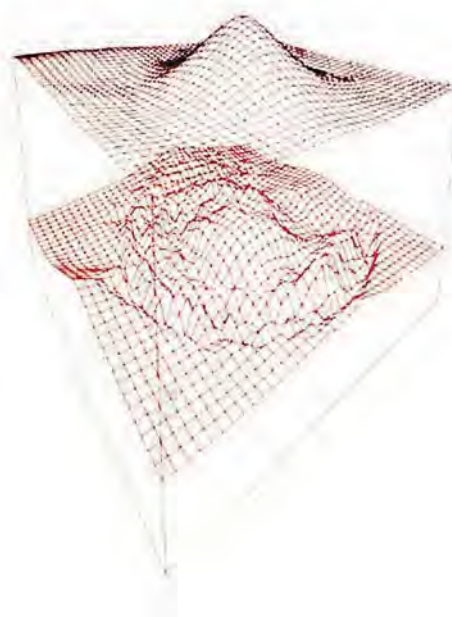
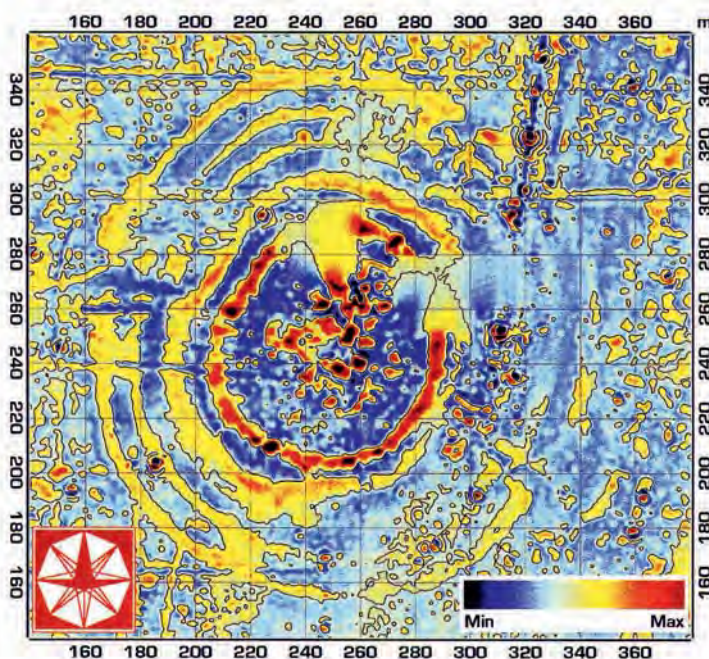
Fig. 9.5: Aerial photography on the paths of M3 motorway.

of the micro-environments surrounding individual sites, we analyzed a series of satellite and aerial photographs – the first such application of the latter in Hungarian archaeology. One happy coincidence in this respect was that aerial photography projects headed by R. Goguet from France and O. Braasch from Germany were launched in Hungary during the 1990s. These different international projects enabled the preparation of aerial photographs within the environment of Motorways Mo, M7 and M3. The national aerial photography archives in the Institute of Archaeological Sciences of the Eötvös Loránd University and the Department of Ancient

History and Archaeology at the University of Pécs, grew out of these projects.

4. Systematic field walks cover a 200 m wide band along the planned routes of motorways. During these field surveys all conventional methods of archaeological topographic work are applied in an effort to pinpoint sites as precisely as possible and identify the archaeological periods represented.
5. In certain cases, it seems necessary to study the intensity of settlement as expressed in the vertical stratigraphy of sites in greater detail. In such cases, survey methods are verified using magnetometric research and subsurface probing (fig. 9.6). The natu-

Fig. 9.6: Results of the magnetometer surveys and systematic test borings at the site of M3 motorway (Polgár-Csőszhalom).



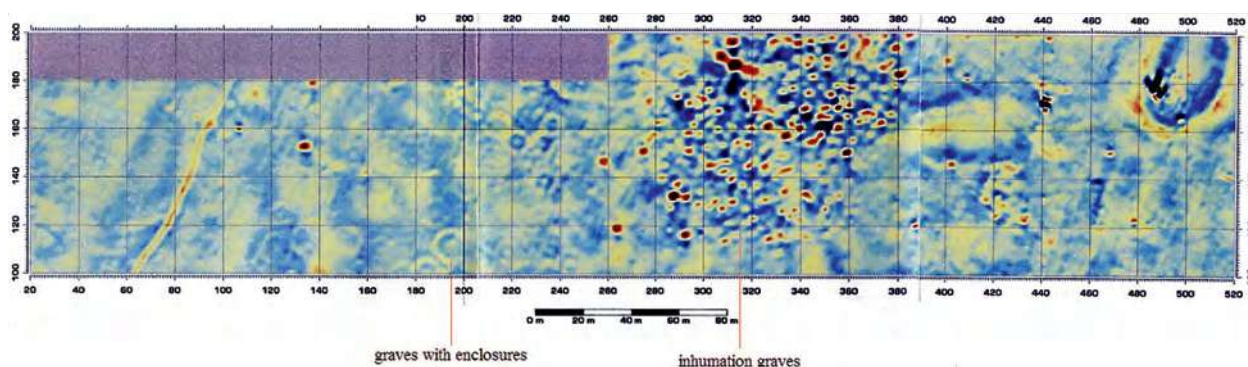


Fig. 9.7: Sarmatian cemetery at the same site with enclosures and inhumation graves (Hajdúdorog-Szállásföldek).

ral topography of the plains in Eastern Hungary offered an excellent opportunity for magnetometric surveys by specialists working in the Department of Geophysics of the Eötvös Loránd University since the anomalies related to level differences were minimal. The most spectacular results came from the single-layer and tell-settlements at Polgár-Csőszhalom: Magnetometric surveying at this Late Neolithic site revealed a roundel of five concentric ditches with four „entrances” surrounding the central mound. Subsurface probes were conducted at individual sites to clarify the buried settlement features and stratigraphy. Since these test-borings were conducted within a grid laid over the site, the results enabled 3D computer reconstruction of the subsurface layers. Magnetometric surveys at a site of Motorway M3 revealed an accurate map of a Sarmatian cemetery with graves encircled by ditches (fig. 9.7).

6. Summary evaluation is used to synthesize all these details within a standardized framework along the

entire construction section of the motorways. This facilitated the ranking of sites and the respective optimal methods of excavation along the motorways, based on the individual characteristics of sites as well as their correspondence with the scheduling of construction work. In several cases, even the planned routes of the motorways could be modified on the basis of these summary evaluations, since the original direction would have cut across once intensively inhabited settlements or *tumuli* (burial mounds) identified during preliminary archaeological surveys. A Bronze Age tell-settlement, Polgár-Ásotthalom, could not have been properly excavated given the short deadline. Moreover, its immediate natural environment was also worthy of conservation. These professional arguments were appreciated by the National Motorway Consortium, whose engineers modified the route plans of Motorway M3 running along the left bank of the Tisza River near the town of Polgár.

Fig. 9.8: Comprehensive archaeological project at a Late Neolithic settlement, Polgár-Csőszhalom (Motorway M3).



Processing large quantities of finds and information

On the basis of data obtained during the archaeological survey of the Hungarian motorway system it became clear that the sites from various periods lay, on average, at about 1–1.5 km from each other and that settlement at every fourth site was fairly intensive. The excavation of sites, in cooperation with local archaeologists employed in the 19 counties, began following these preliminary investigations. In addition to standardizing the methods included in the protocol for preventive excavations, the University Institute also paid special attention to work out further details relevant to large-surface research and the evaluation of the resulting data. For example, a 4 ha section of the Late Neolithic settlement around Polgár-Csőszhalom was investigated on the Great Hungarian Plain (fig. 9.8).

This area included over 70 house entities. It also became clear that due to the extent of the investigated areas, the number of excavation drawings would run into the hundreds, adding up to several thousand for a single county. The same held true for the photo-

graphic documentation. Obviously this visual information could not be stored as it had been previously. To solve this problem, the GIS laboratory digitized the graphic and photographic data from the 40 km long Hajdú-Bihar County section of the Motorway M3. The database, containing information on the finds recovered from the various archaeological features of a site, was linked to this visual database, creating a uniform body of information, which incorporated both excavation data and earlier information from a particular site. Such a system was of key importance in the registration of large numbers of archaeological finds (Raczky et al 2002). This system was essentially a slightly modified version of the Harris-matrix recording system. Stratigraphic data associated with, and the individual registration number assigned to each find, conformed to the need for a museum inventory number and thus enabled us to discard the unnecessary and complicated dual registration system traditionally used in Hungarian museums. This database, which integrated excavation records, finds and spatial information alike has become part of the university

Fig. 9.9: Archaeological excavations related to the development of the public road network in Hungary between 1990 and 2007 (Raczky 2007, 13).



curriculum. Thus, its impact in Hungarian archaeology is continuously increasing through the involvement of graduates of the University Institute in preventive archaeological projects.

In addition to renewing the system of documentation, handling the tons of new finds had to be likewise modernized. In order to facilitate this indispensable development an archaeological base was created in the town of Polgár. Subsequently, a number of archaeological bases were established along the planned route of the Hungarian motorways, which included infrastructure for the cleaning and the conservation of the finds, facilities for drawing, photographing and storage, as well as equipment for entering them into the registration database. These archaeological bases also served to accommodate excavation staff, minimizing costs of travel and transport. These bases also solved the problem of where the finds – running into the millions over the years – could be stored since Hungarian museums simply have no adequate storage facilities for such an immense number of artifacts.

The second phase of large-scale excavations: 1997–2007

Dimensions of motorway-related excavations

Motorway construction intensified after 1997. The new sections built between 1998 and 2007 added up to 607 km (KSH 2007). From the viewpoint of archaeological research, however, this meant far more work, as preventive excavations along the public road network between 1990 and 2007 covered 1,069 km (fig. 9.9). Details of this problem were discussed in a review article on motorway excavations (Raczky 2007).

The challenges posed by the preventive excavations along the planned routes of the Hungarian motorways greatly contributed to the renewal of Hungarian archaeology. The earlier practice of ‘one-man digs’ could not be continued, and work on such an extensive scale could only be accomplished through teamwork (as in Western Europe). The archaeological projects along the motorways of Hungary involved the coordinated work of 200 to 250 archaeologists, some 500 archaeology students and a technical staff of over 500. No other previous excavation project had called for such a ‘concentration’ of professional and technical staff, which has posed a nationwide challenge to Hungarian archaeology. The dimensions of this work are shown by the fact that various sections of the almost 650 km long motorway built between 1990 and 2007 required excavations at 690 to 700 sites whose details are published in the literature (Raczky 2007, table 1 and fig. 1). By 2007, the total surface uncovered by excavations preceding motorway construction exceeded 7 million square meters. The county museums along the paths of motorways contributed to this work to varying degrees, trying to adapt to the hectic pace of development (table 9.1).

In some counties the areas to be excavated did not exceed 5 ha (e.g. in hilly Nógrád County), while in others excavation surfaces were tenfold (e.g. Pest County: Üllő 5 and 9 settlement complex; table 9.2). Consequently, in certain counties excavations covered 1 million square meters, that is 100 ha (Pest and Somogy Counties; Raczky 2007).

The 2001 heritage law

By the second half of the 1990s, excavation methodology changed. Principles of excavation duties and financing were outlined in Law 140/1997, providing a background for contract archaeology. Creating new regulations became indispensable in alerting developers in time concerning their legal responsibilities related to their property and to guarantee that preventive archaeological activity should cover all sites. The presently valid legislation was enacted in 2001 (Law 64/2001 on the protection of cultural heritage followed by executive decrees). The following legal definition of archaeological sites has been put forward: archaeological sites are clearly defined geographical areas in which the elements of archaeological heritage can be found in primary condition and context and which have been registered by the National Office of Cultural Heritage (established in 2001 by merging the former two institutions: the Cultural Heritage Directorate and the National Board for the Protection of Historic Monuments). The law announced that all known sites are protected by the force of the law, besides these registered, *ex lege* protected sites the non-registered phenomena, archaeologically sensitive areas/areas of archaeological interest also form part of the archaeological heritage (Jankovich 2009; Visy 2009; Wollák 2007b; Wollák 2009). The legislation introduced new mechanisms, certain preventive administrative tools:

1. The office is authorized to formulate expert opinion in the case of different developments and to prescribe the method of preservation for archaeological sites, ranging from *in situ* preservation to preventive excavation affecting the entire surface. The office's expert opinion becomes part of the development license and is binding for the developer.
2. A complex evaluation technique, called Heritage Impact Assessment (HIA), was also implemented. During the preparation of master plans of each site it is obligatory to prepare a HIA report, exploring the elements of archaeological and built heritage. In the case of determined developments, preparing this assessment is likewise required. This could help not only the heritage office in defining the necessary degree of preservation method, but also the developer, who could decide in advance whether to choose another territory without archaeological implications, or to calculate with the costs and time requirements of the preventive excavations.

This new law required the creation of the centralized and authentic registration of the sites and monuments by the office and strengthened the licensing system of the excavations. Archaeological field activity – any type of excavation – can only be conducted with a license. Both institutions and individuals are subject to this licensing process. However, as there is no commercial archaeology in Hungary, private firms cannot obtain excavation licenses. In case of investment-driven archaeology, county museums have primary authorization to carry out excavations; the developer can sign a contract exclusively with them. Certain elements of quality control form part of the legislation (Bozóki-Ernyey 2007; Wollák 2007b).

Although the 2001 heritage law created a situation better regulated, its legal definitions – including those

Counties	The years county museums joined preventive motorway excavations																
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
(Budapest)						•	•								•	•	•
Bács-Kiskun						•	•		•		•		•	•	•	•	•
Baranya																•	•
Békés						•	•	•	•				•	•	•		•
Borsod-Abaúj-Zemplén			•	•	•	•	•	•			•			•			
Csongrád				•	•				•	•	•	•	•	•	•		
Fejér													•		•		
Győr-Moson-Sopron	•	•	•	•	•									•	•		
Hajdú-Bihar				•	•	•	•	•	•			•	•	•	•	•	•
Heves			•	•	•	•	•	•									
Jász-Nagykun-Szolnok										•	•				•	•	•
Komárom-Esztergom	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Nógrád														•	•	•	•
Pest	•	•			•	•						•	•	•	•	•	•
Somogy					•	•				•	•	•	•	•	•	•	
Szabolcs-Szatmár-Bereg																•	
Tolna						•	•	•	•	•						•	•
Vas										•	•	•	•	•	•	•	•
Veszprém														•	•	•	•
Zala megye										•	•	•	•	•	•	•	•

Table 9.1: Involvement of county museums in motorway excavations. 2007* = incomplete series of data, information on continuous excavations in 2007–2009 is incomplete, e.g. work by the the Budapest History Museum on Motorway Mo is missing. x = licensed to Field Service of Cultural Heritage, excavations carried out by the themselves; o = licensed to Field Service of Cultural Heritage, excavations carried out in cooperation with county museums and other institutions (compiled by Katalin Wollák after the article by Pál Raczky; data on Field Service of Cultural Heritage: Gábor Virágos personal communication).

County	Area of county, km ²	Length of motorway, m 1990–2007	No. of excavated sites 1990–2007	Excavated area, m ² 1990–2007	Excavated area, m ² Field Service of Cultural Heritage 2007–2010	Excavated area, m ² 1990–early 2010
Budapest	525	16,530	10	180,145	no data	180,145
Bács-Kiskun	8,445	95,402	41	405,439	73,735	479,174
Baranya	4,430	51,500	16	169,061	136,429	305,490
Békés	5,631	28,900	33	227,400	no data	227,400
Borsod-Abaúj-Zemplén	7,247	73,300	36	156,036	21,967	178,003
Csongrád	4,263	70,502	85	834,421	348,073	1,182,494
Fejér	4,359	53,500	30	248,154	156,870	405,024
Győr-Moson-Sopron	4,208	71,050	16	382,700	142,160	524,860
Hajdú-Bihar	6,211	110,700	47	631,247	85,825	717,072
Heves	3,637	12,830	36	317,370	49,573	366,943
Jász-Nagykun-Szolnok	5,582	25,000	9	45,700	19,520	65,220
Komárom-Esztergom	2,265				–	
Nógrád	2,546	7,200	8	42,700	–	42,700
Pest	6,393	133,100	99	1,460,574	24,984	1,485,558
Somogy	6,036	84,704	49	1,002,487	3,447	1,005,934
Szabolcs-Szatmár-Bereg	5,936	33,000	42	409,418	55,664	465,082
Tolna	3,703	45,700	24	323,050	623,903	946,953
Vas	3,336	35,310	38	209,116	147,076	356,192
Veszprém	4,493	19,500	4	85,920	8,555	94,475
Zala	3,784	73,500	73	557,125	62,094	619,219

Table 9.2: Excavated areas by county, 1990–2010.

of the archaeological site and its way of registration – provoked fierce debates within the archaeological profession (Szabó et al. 2006). Experts have especially criticized the flaw that the 2001 law treated already known and potential archaeological sites as different entities (Raczký 2006). Consequently, previously non-investigated, but potentially valuable sites were at risk of destruction. They rejected legal arguments that the owner of a real estate or the investor could only be expected to pay excavation costs if he or she were fully aware of the fact of the archaeological importance on the planned construction site.

The supreme professional body of archeologists in Hungary, the Archaeological Committee of the Hungarian Academy of Sciences, published a statement in 2003. This document pointed out that the legal status of newly excavated archaeological materials is uncertain, since according to the heritage protection law, archaeological artifacts – in principle – belong to the Hungarian State. After the excavations and subsequent storage, however, ownership is transferred to local, county governments, as the finds get into the storage facilities of the county museums. A higher level of uniform national heritage, however, would guarantee state protection to these finds. The statement by the committee also emphasizes that museum inventorying of archaeological materials should be rationalized and that finances spent on archaeological projects related to large-scale investments should be centrally controlled in order to create uniform professional standards and coordinate activities in various county museums (Szabó et al. 2006).

In spite of its fallacies and incompleteness, the 2001 heritage law and its executive orders have fulfilled an important role: in the case of the overwhelming majority of investment-led projects it became possible to guarantee that viewpoints of heritage protection be respected. Thus protected (scheduled) archaeological sites of special status could be even better preserved, and known sites became subject to mandatory preventive excavations that had to be fully documented, thus yielding new archaeological information.

Meanwhile, regulating motorway investments also became increasingly standardized. The so-called “motorway law” was passed in 2003.⁷ On the basis of preliminary environmental assessment, the government singled out a maximum of two planned motorway paths that were subject to archaeological heritage surveys following the protocol developed by the University Institute. The final direction of motorways was decided upon considering all these results, following proper archaeological preparatory work.

The majority of county museums authorized to carry out motorway related fieldwork wished to perform the increasing task posed by developers relying on their own staff. Others sought cooperation with the Academy Institute, the University Institute and in some cases with the National Museum. Increasing demand for professional excavations induced the creation of the Archaeosztráda Ltd within the framework of the Hungarian Academy of Sciences in 2003. The staff of the Academy Institute provided the professional background of this organization. In addition some smaller private enterprises – with no independent excavation licenses – entered the scene by the end of the millennium. They were usually employed by county museums

where not enough archaeologists were applied in the permanent staff.

By this time, the schedule of preventive excavations was in place. Following the heritage impact assessment, the possible forms of archaeological intervention were determined: which sites need full-surface preventive excavations, where should test excavations be carried out first, and how to proceed afterwards. Areas of the motorway path were also identified where archaeological watch was sufficient following surveys that had showed but a small frequency of archaeological sites, in such areas further intervention could also be carried out necessarily. A sample contract was drafted under the direction of the National Office of Cultural Heritage, the body that issues the excavation permits. It provided guidance concerning special points beyond plain legal regulations. Following the approval of the contract by the Office, field campaigns could begin. The investigated area along the motorway’s planned path was handed over to the institute in charge of preventive excavations following a complex procedure that included the appropriation procedure as well. Construction work could begin once fieldwork by archaeologists had officially been accomplished. The National Motorway Consortium and its legal follower, the National Infrastructure Development Consortium also offered opportunity for the so-called project supervision assistance, which would identify previously undiscovered archaeological features along the path under construction and take immediate care of its rescue excavation. In order to help keeping to construction deadlines, the expenses of such emergency work were also covered by the developer beyond the excavation budget previously agreed upon with archaeologists.

Publicizing results

In addition to tackling immense tasks in the field, county museums also made special efforts to at least the preliminary publication of their results. Since the 1950s, one of the platforms for such publications was the series called “*Régészeti Füzetek*” (Archaeological Notebooks), where excavation reports of the past year regularly appeared. Currently, the series entitled “*Régészeti Kutatások Magyarországon*” (Archeological Investigations in Hungary) publishes annual reports on fieldwork in addition to some articles presenting new results and sources. In addition to the annals of county museums, several independent volumes have been published presenting the results of fieldwork. One of the first such publications was the set of volumes showing results of preventive excavations along Motorway Mo, the bypass road around Budapest (Selmeczi & Havassy 1992). Information on archaeological research in Pest County during the years 2001–2006 was available already by the closing year of that project (Tari 2006). In terms of publication efficiency the next volume was entitled “*Paths in the Past*” (Raczký et al. 1997), which summarized the results of excavations along Motorway M3. A volume presenting results from Csongrád County came to light in 2003 (Szalontai 2003). The Budapest History Museum excavations preparing Motorway Mo were first summarized in a 2005 publication entitled “*Treasure Under the City*”, and another volume came out by 2009 (Zsidi 2005; Endrődi & Szilas 2009). The exemplary cooperation between Somogy

County and the Academy Institute between 1994 and 2003 yielded yet another volume entitled „Rolling Time” (Belényesy et al. 2007). In addition to summarizing information on the sites recovered along the path of Motorway M7 in Somogy County, this volume also contains a historical summary of various archaeological periods. Archaeological works carried out between 1999 and 2008 along additional sections of Motorway M7 in Zala County have been published in a digital format (Horváth & Frankovics 2008). Preventive work in the Szeged–Makó section of Motorway M43 was already coordinated by the Field Service of Cultural Heritage in cooperation with the Csongrád County Museum and the University Institute. Results of this research were published in 2009 (Balogh 2009).

Following the proportions during the second phase of large surface excavations (Table 9.3) the contribution of an increasing number of counties may be detected (Bozóki-Ernyey 2007). Although the activities of museums have been detailed in the statistics issued by the ministry responsible for culture, sub-divisions of such precision are available only from 2005 (see table 9.1, above).⁸

“Motorway excavations”: some examples

Archaeologists involved with these excavations were not only interested in professional publication. They were also keen on presenting the cultural wealth that had been recovered to the broader public. One of the most popular forums in this regard has been the series *Magyar Múzeumok* (Hungarian Museums). The first issue in 2007 (*Magyar Múzeumok* 2007/1) was dedicated to presenting the results of motorway excavations (Wollák 2007a). That publication included excavations preceding the constructions of Motorways Mo, M3–M35, M5, M6, M6–M60, M7, and M7–M70, as well as flood control projects along the Tisza River that grew out from the so-called Vásárhelyi River Regulation Scheme.⁹ It offered a good summary concerning the extent of excavations and the highlights of fieldwork that were deemed worth sharing with the broader public. A few examples deserve brief reviewing here.

During the 2004–2007 construction of Motorway Mo, the bypass around Budapest, the Budapest History Museum carried out excavations at seven sites, uncovering a total of 105,912 m². Special attention was paid to the scientific analysis of data, exhibiting the resulting finds and organizing academic analysis in a way that would keep abreast with fieldwork.¹⁰ The institution stands for the principle that the broader public should also benefit from these large-scale projects.

The 2003–2006 excavations along Motorways M3–M35 were carried out in cooperation between the Hajdú-Bihar County Museum and the University Institute. Fieldwork by then followed a carefully developed technology recovering 13 sites over a surface of 161,019 m² along the first section and 15 others over another 210,328 m² of surface along the other sections.

Twentysix sites were recovered in the 295,000 m²-area excavated by the Bács-Kiskun County Museum along Motorway M5. (This museum also conducted the preventive excavations of 4 additional public roads and 3 shopping malls.) In their summary evaluation they emphasized that these projects have entirely changed and fine-tuned previous knowledge concerning the county’s history.

Archaeologists at the Tolna County Museum found 19 sites along a 29 km stretch of Motorway M6. Nine of these were selected for test excavations, while full recovery was recommended at the remaining 10 sites. In the first case, verifying excavations could not reveal additional features at 4 sites, while full recovery became necessary at the remaining 5. According to the plan, work was carried out over a surface of 215,000 m², involving 7–9 working parties. During the course of this rescue work the area that had to be studied increased by 50 %. The museum established its own evaluation center with capacities for documenting, data storage, inventorying, drawing, photographing and storing this material. A conservation workshop was also dedicated to process the large ceramic artefactual assemblage. At the time this paper is written there are still 60 km of motorway to be built in this county, requiring the excavation of an area covering 337,736 m².

Year	All archaeological activities	Planned excavations	Preventive excavations	Motorway preventive excavations	From all archaeological activities done by		
					County museums (including the capital’s museum)	Other institutions (universities, research inst., Natl. Museum)	Field service (spring 2007–summer 2010)
1999	317						
2000	410						
2001	439						
2002	484	90	287				
2003	558	63	369				
2004	587	43	378				
2005	765	38	371	172	687	78	
2006 Jan.–Sept.	700 (estimated)	41	207	102	476	53	
2007	726	66	500	66	478	48	200
2008	785	93	525	153	375	64	346
2009	857	119	582	200	431	39	477
2010	641	171	410	110	364	42	235

Table 9.3: Archaeological activities licensed by the National Office of Cultural Heritage.

According to a summary by the Baranya County Museum, the planned 90 km long stretch of Motorways M6 and M60 was covered by field walks in a distance of 100 km between 2001 and 2002. Having surveyed 83 % of this surface (17 % were covered by forests, swamps and meadows), 75 sites could be identified. The results were supported by aerial photography with measuring equipment. During the course of the 2005–2006 excavations, a surface measuring approximately 400,000 m² was investigated. Although part of this motorway section remains to be excavated, that part of the project stretched into phase 3 of large-scale excavations (see below).

The Somogy County section of Motorway M7 has already been mentioned in relation to the relevant publication entitled *“Rolling Time”*. A few additional data, however, are worth reviewing. Preventive excavations between 1999 and 2006 had to be carried out along 80 km of motorway path and an additional 30 km of smaller auxiliary roads and gravel quarries. This meant the recovery of 71 sites over a surface of 1,100,000 m² that yielded over 1.5 million artifacts. The motorway crosses four geographical areas of radically different character that may be described as follows, proceeding from Northeast to Southwest:

1. Leaving the banks of Lake Balaton, a variegated and largely forested landscape had to be surveyed (this area yielded no sites, not even following the destruction of woodland that was part of the construction).
2. Two large, partially drained swamps also had to be surveyed that yielded sites only along the ancient embankments.
3. Near the banks of Lake Balaton, gently rolling hills oriented north to south revealed once lacustrine sites representing numerous periods.
4. The so-called Little Balaton marshland in the south was characterized by a more loose settlement structure.

Motorway M7(–M70) continued in Zala County, where field walks took place in 1994. Help by aerial photography and geophysical surveying were also enlisted in locating archaeological sites. Excavations began only in 1999 and lasted until 2008. Fieldwork affected 510,000 m² and resulted in the recovery of 14 (M70) and 45 (M7) archaeological sites respectively. An archaeological base was established in Becsehely in the building of a former agricultural cooperative, where documentation could be digitized and the conservation and storage of find material also became possible. In addition to relevant publications, the results were also presented in the permanent exhibition of the Nagykanizsa Museum (*Magyar Múzeumok* 2007/1).

Another three articles in the same periodical discuss the results of archaeological excavations carried out within the framework of the Extended Vársárhelyi Project. This work involved the museums of Jász-Nagykun-Szolnok (JNKSZ) and Borsod-Abaúj-Zemplén (BAZ) counties as well as archaeologists from the National Museum and the University Institute. The aims of this program included flood prevention in the Tisza River Valley. This meant that a system of 6 reservoirs had to be constructed to buffer the effects of capricious periodic flooding. Work began on three reservoirs between 2005 and 2007: in the area of Cigánd-Tiszakarád

the BAZ County Museum uncovered 160,000 m². At the location of the Tiszaroff reservoir 190,000 m² were excavated by teams of the JNKSZ County Museum and the National Museum. Finally, when reconstructing the system of dams at the Rákóczi-falva-Bivalyó reservoir covering a surface of 290,000 m², work was carried out in cooperation between teams of the JNKSZ County Museum and the University Institute (*Magyar Múzeumok* 2007/1).¹¹

Referring to all relevant archaeological reports and studies would be far beyond the scope of this article. Some, however, were singled out here as they had brought new results from a methodological point of view, for example in handling the mass of post-excavational information or applying spatial informatics in reconstructing the layout of sites (Csáky & Figler 1995; Raczky et al. 1997; Raczky et al. 2002). Articles discussing the development of 3D models, the processing of aerial photographs, georeferencing and the use of mobile equipment in spatial informatics are of special interest (Czajlik et al. 1997; Eke et al. 2007).

Achievements of the second phase of large-scale excavations

The characteristics of the second phase of large-scale excavations are summarized in Table 9.4.

As is shown by these developments, the models for surveying and evaluating archaeological heritage have been in place. Museums have become increasingly sophisticated in fulfilling tasks related to preventive excavations. Communication with planners, investors and developers has increased. One of the results of this prosperous cooperation is that during the construction of Motorway M5 in Csongrád County, the local museum was also commissioned to carry out environmental and ethnographic surveys related to the development (Szalontay 2001; Szalontay 2003). In the late 1990s pyrotechnical surveys, that is the location and neutralization of abandoned bombs and ammunition, also became part of this standardized procedure.

In a system lacking competition, county museums having exclusive rights to excavate had to be prepared both in terms of personnel and infrastructure to carry out tasks under the pressures of tight deadlines. Not all of these institutions, however, considered the need for long-term solutions concerning conservation, storage and evaluation. Difficulties were compounded by new financial regulations that made it mandatory to apply public procurement procedure for any budgetary development that would have exceeded a certain sum both in material acquisition and buying services, which circumstances are far too complex to be discussed here. Amidst ever-dwindling central funding, county museums financed by local governments began increasingly relying on preventive excavation budgets to complement their budgets spent on basic operations. This solution was successful in temporarily treating symptoms, but created resentment in investors and developers.

Organizing the workflow also had to be changed. Fieldwork had to be compartmentalized into a team system: in addition to technical and scientific staff, field directors also had to oversee manual work and mechanized earth removal. The workload often exceeded a hectare per month, and techniques of excavating throughout

Working phases	
Preparation and field work	Post-excavational work
Preparatory activities	Documentation
Field survey	Excavation log book
Evaluation of survey results	Photographs
Determining the mode of archaeological action	Drawings
Acquisition of legal permit (appropriation)	Geodesy (maps, surveys and summaries)
Ammunition disposal – delivery of the territory	Short report and full documentation
	Conservation
Field work	Ceramics and other finds
Mechanized and manual earth removal (humus)	Inventorying
Documentation of archaeological phenomena	Carried out by the adopting/host institution
Registration of artifacts	Storage
Packing of artifacts	Final deposition and storage of artifacts
Cleaning of artifacts	Analysis/presentation
Provisional deposition of artifacts	Short academic communication
Public relations	Exhibition
	Public relations
Scientific analyses	Scholarly evaluation
In part on location and thereafter	Presentation in situ

Table 9.4: Working phases of the preventive archaeology.

the winter also had to be invented. As information carried by the top layers was lost due to mechanical humus removal, therefore, special diligence was required during the excavation. This made the standardization of field methodology indispensable. One of the fundamental elements in this work was developing a consistent technical nomenclature that had already been exemplified by the wording of the protocol developed by the University Institute. Although a significant number of county museums have developed their own, well-crafted and coherent field inventory and digitizing systems (Szalontay 2001; Szalontay 2003; Tari 2006; Belényesy et al. 2007; Horváth & Frankovics 2008), these independent achievements lacked compatibility. Moreover, many redundancies resulted from costly parallel efforts, and sometimes the sophisticated data processing systems lacked proper archiving. The majority of county museums created storage, data processing and conservation facilities in the immediate proximity of excavations (Becsehely, Vecsés). In other cases facilities of the original museum base could be expanded (Szeged: Szalontay 2003; Nyíregyháza: Kurucz 2008), as these museums acquired several tons of find material within a few years. These quantities often exceeded the amount of archaeological materials accumulated during the preceding century.

Large-scale excavations also offered a unique opportunity to compare the results of field walks, surveys and the excavations themselves. Although features of natural topography have a direct bearing on the location of archaeological sites, the existence of archaeological features was often recognized during archaeological observation or even amidst construction work, also even following unsuccessful field walks. Furthermore, in certain cases the sites turned out to be larger than expected. Having evaluated immense quantities

of data acquired during the course of archaeological topographic surveys carried out within the framework of the motorway excavations, important conclusions can be drawn. The average distance between sites was 1–1.5 km, and every fourth site shows signs of intensive habitation. In certain regions where population density must have been relatively high, a greater frequency of intensively inhabited extensive sites could be observed (Raczky 2007, 9).

The enlargement in settlement size may also be explained by the fact that investors and developers rarely consented to the use of complex surveying techniques (e.g. geophysical measurements and soil boring) beyond field walks, and test excavations were not routinely performed either. Previously, however, it was impossible to make observations relevant to settlement structure such as the existence of clustered habitations and hamlet-type settlements. These observations have revealed weaknesses in the exclusive reliance on field walks in detecting archaeological sites. On average, it may be said, 15 % of the sites hypothesized on the basis of field walks could not be verified by the evidence of excavations. For example, in the 36 km long southeast segment of the Mo bypass road, 51 previously unknown sites were registered during field walks. On the other hand, only 35 sites containing archaeological features could be verified through excavation (in three cases no research was carried out). Notably, test trenches showed negative results in 13 cases (Tari 2006).¹² These discrepancies raise the important point that the application of aerial photography in surveying should be reconsidered, as such photographs have been instrumental in identifying sites known from the literature and pinpointed during field walks (Miklós 2007). In addition, certain surface phenomena such as cemeteries, elements of land use, systems of defense features (cor-

rals, ditches) cannot be detected through field walks (Czajlik 2009). It is therefore worth considering that future field walks should be carried out after having consulted not only the technical literature and known field observations, but also an analysis of aerial photographs relevant to the area.

The third phase of large-surface excavations: 2007–2010

When characterizing the third phase, the economic environment at the end of the first decade of this millennium cannot be disregarded. Beginning with 2007, Hungary was eligible to apply for financial resources detailed in the 2007–2013 budget of the European Union. Therefore it was deemed of critical importance (both by investors and the government) that large-scale development (such as motorway construction) had no authority in coordinating archaeological activity in terms of deadlines and pricing. Systematic regulations were lacking that would have synchronized work within a project that by then had spanned several counties.

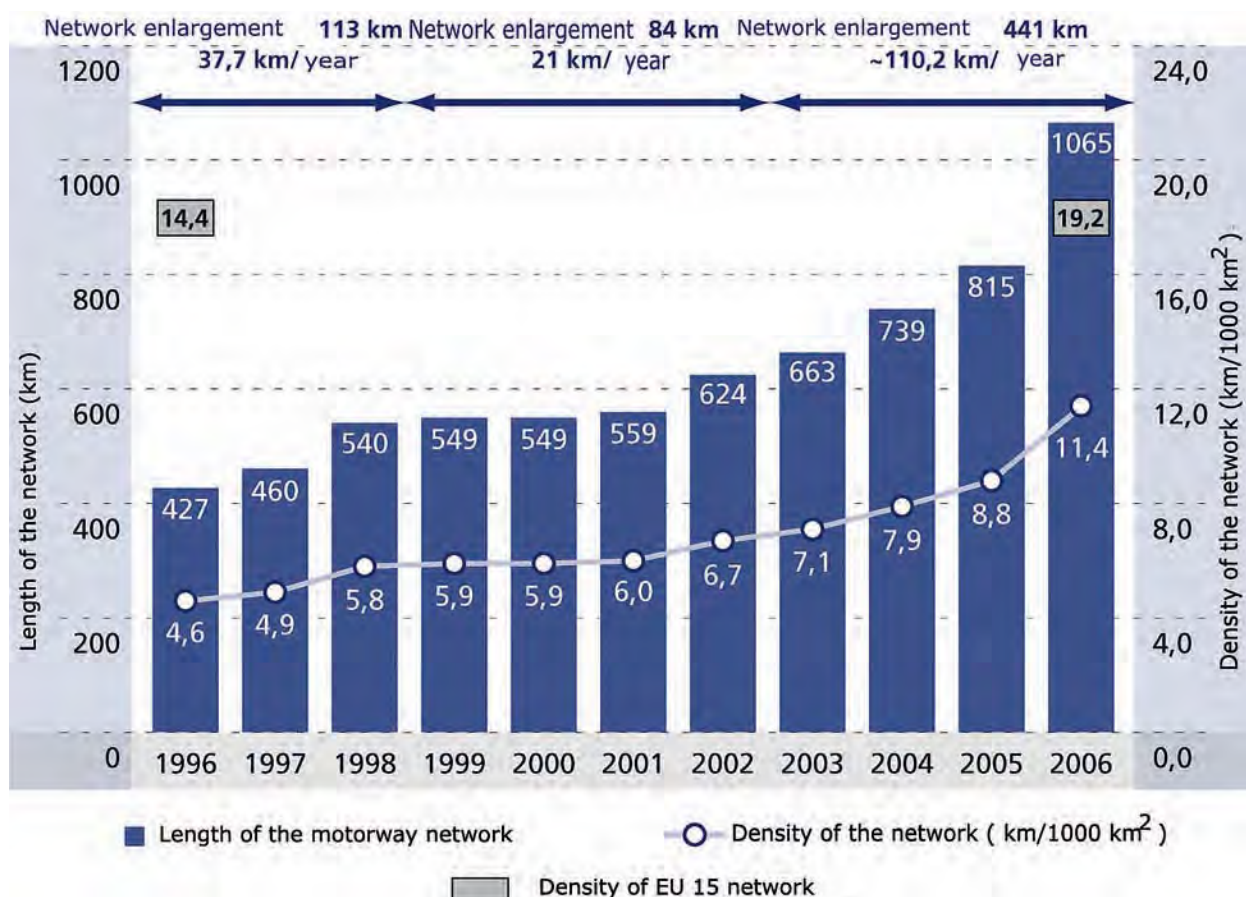
The development of our profession had not yet reached the level at which consequences of the exploding information in cultural/archaeological heritage management could have been handled in a standardized manner. The quality of activities and outputs by county museums tended to be heterogeneous, which often resulted in the delay of investment projects, thus significantly increasing their expenses. Given the accelerating pace of developments, motorway contractors

increasingly expected predictable and transparent performance by archaeologists (Csillag 2008, 74) (fig. 9.10).

The Field Service of Cultural Heritage

There was thus increasing consensus that a state controlled organ in archaeology would have been a more reliable partner from the contractors' point of view. During february 2007, the National Motorway Consortium was transformed into the National Infrastructure Development Consortium, and this new body maintained the view that a single negotiator would have been easier to deal with than the variegated complex of 19 county museums and the Budapest History Museum. These developments resulted in an arbitrary modification of excavation regulations in April 2007, without the consensus of the broader archaeological community. Following this political decision by the government, a centralized body, the Field Service of Cultural Heritage (hereafter Field Service) was established. It obtained exclusive rights to perform all archaeological prevention for those (private and state) "major developments" whose budgets exceeded 2 million euros. One of the expectations was nationwide coordination, and a respect for deadlines. Excavations had to be organized and executed on an industrial scale. Human and material resources had to be transferable and efforts were made to eliminate redundancies in the system, which ran a transparent budget. These changes, however, delivered a major blow onto the network of county museums that for over a century had been in charge of archaeological work, including the acquisition and exhibition or archaeological artifacts. Some

Fig. 9.10: The motorway network of Hungary (Csillag 2008, fig. 70).



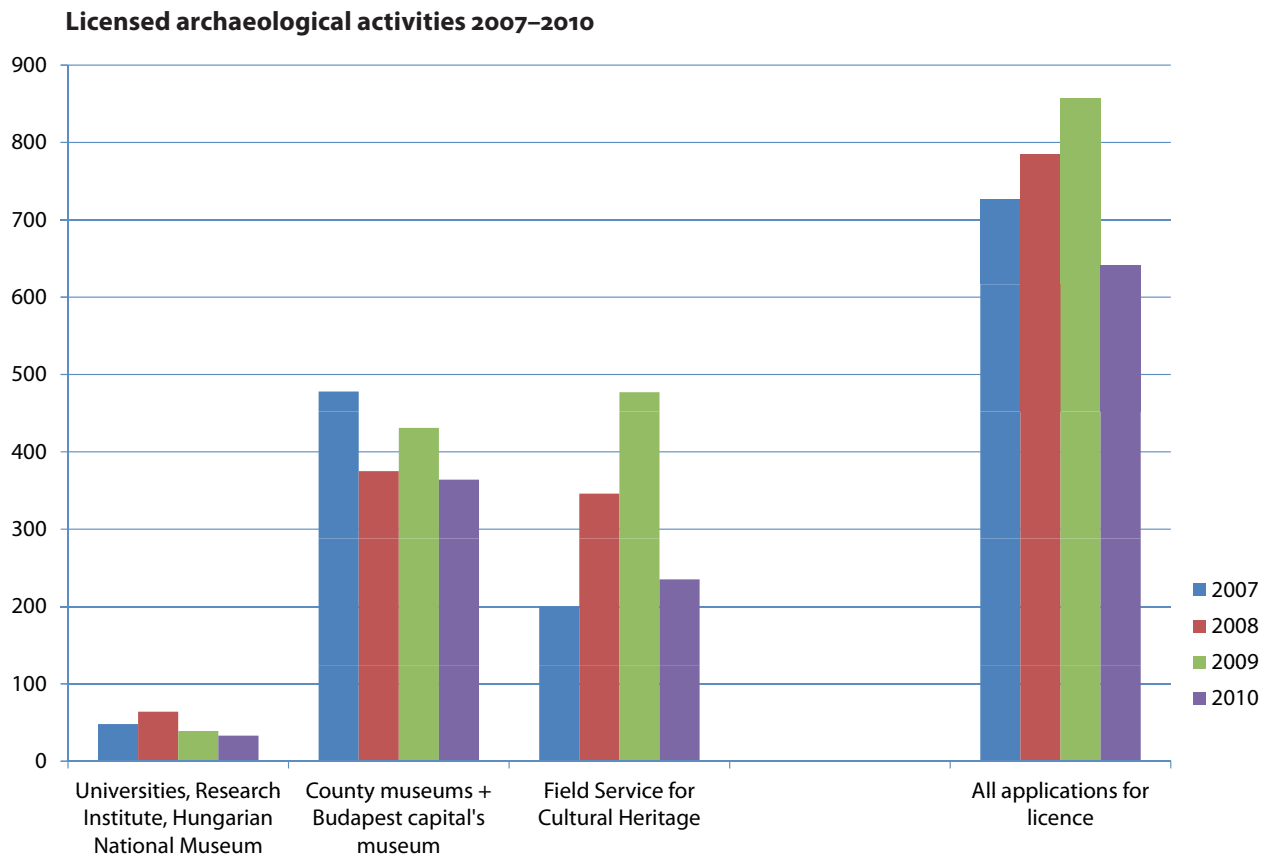


Fig. 9.11: Changes of the tasks between county museums and the Field Service.

museums just finished preparing their local organizations for motorway constructions (e.g. counties along Motorway M6). By the end of 2006, however, no contracts were made between county museums and the National Infrastructure Development Consortium. Motorway contractors began to contract with the Field Service instead. County museums that were still willing to cooperate were “sub-contracted” to the Field Service, they only had the opportunity to conduct certain excavations (fig. 9.11) (on a lower cost-level) and to receive the finds for storage.

These changes caused a major rift within the archaeological community. Therefore results by the new organization have not been widely accepted. Although after initial “childhood diseases” the performance of the Field Service began improving, these positive developments failed in producing a breakthrough. This organization employs many young archaeologists and provides one fourth to one third of all jobs in Hungarian archaeology. It has made serious efforts in handling resources efficiently in a way that met the expectations of both archaeologists and developers and investors. On the other hand, robustic communication with the broader public was another important target. As for the extent of involvement, it should be mentioned that during its three years of operation the Field Service performed archaeological tasks in one fifth of the approximately 10 million m² that had been excavated before 2007 (see fig. 9.11, above).

Professional and public relations performance

Among the achievements it must be mentioned that in preparing heritage impact assessments, archaeological

outcome has become mandatory before “major development”. Price lists of various services offered by the Field Service were elaborated and publicized on the organization’s website (www.kosz.gov.hu), although without supporting calculation. These important organizational steps, however, have not made excavations cheaper. Another exemplary achievement was the development of professional protocols supported by the Academic Advisory Board that employed external experts. As a result, excavation, documentation, protocols as well as standards of post-excavation work have been made available nationwide on the organization’s website. This publicity means that these schemes are not only accessible to the five regional offices of the Field Service of Cultural Heritage. The organization has also commissioned reliable personnel using metal detectors to comb through the areas to be excavated along the motorways both prior to the mechanized humus removal and afterwards. This arrangement minimizes the loss of at least metal artifacts.

In addition to guidance to excavation-related subjects, experts in the organization’s well-equipped laboratories put forward 14 additional professional protocols in the areas of environmental analysis, archaeometry and conservation. The find material brought to light is temporarily stored in the regional network of bases, where conservation capacity is also available. They will be moved for final storage into county museums or the National Museum.

Various excavation reports have been published within the framework of the evaluation program. Annals came out in 2008 and popular articles appeared in “*Módszertani füzetek*” (Methodological Notebook; Ilon & Kvassay



Fig. 9.12: The Archaeological Park at Polgár.

2009). The series of small monographs entitled “*Via*” was dedicated to documenting cultural heritage management by introducing individual sites to the public. The first volume in this series was published as well. Although the Field Service does not have public collections, it is involved in significant marketing efforts by various forms of PR activity (open days at excavations, guided tours, mobilizing public persona on behalf of promoting cultural heritage management).

Conclusion and outlook

This paper is an analysis of methodological developments that followed from the increasing number of preventive archaeological excavations resulting from motorway constructions in Hungary. The changes under discussion here characterize the mechanisms that developed as a response to this challenge, a test of prowess. Meanwhile during the second and third phases discussed in this paper, a number of individual large-scale preventive excavations were carried out as well. They were related to other developments such as the construction of shopping malls, logistical bases, garbage disposal areas and petrol stations.

The government policy concerning a new program of communication published in 2003 did not only relate to the public road system. It also contained guidance concerning the development of main train lines, ports, airports, border posts and even bicycle roads. In addition, several narrow track excavations precede the development of sewage, gas, electrical, telephone, optical communication and other systems (Bozóki-Ernyey 2007). County museums and the Field Service

had to perform these tasks in addition to the motorway projects (Kurucz 2008). The order of magnitude of such works can be best illustrated by two examples. During the less than eight months between May and December 2006, the Csongrád County Museum excavated a surface of over 100,000 m² within the area of the Felgyő-Kettőshalmi dűlő archaeological site, prior to the construction of a garbage dump (Mészáros et al. 2007). The construction of a Mercedes plant in Kecskemét resulted in the possibly largest ever excavation in Hungary. This area of 450 ha contained 15 sites and an additional 6 *loci* of potential archaeological interest. Preventive excavations began in November 2008 employing 6 local teams of the county museum and three teams contributed by other institutions. Of the 21 *loci* identified in the preliminary surveys three have not been excavated. Following humus removal over a surface exceeding 443,000 m², test excavations produced negative results at 7 *loci*. During the course of this project, research was carried out over a surface of almost 300,000 m², and archaeological phenomena could be documented at 11 sites,¹³ but on certain sites the excavations have still to be continued.

At the time this manuscript is being closed (summer 2010), the full restoration of rights for county museums is on the agenda, excavation license of the Field Service is withdrawn. For the time being, the professional content and consequences of these changes are unpredictable. It may be hoped that the standards of archaeological work will not suffer and the results thus far achieved will remain sustainable.

Since 1990, all excavating institutions made undaunted efforts to present the archaeological wealth to the public in the form of exhibitions. Several richly illustrated



Fig. 9.13: Present stage and the future plans.

publications also came to light in connection with these exhibitions. They are not simply representative of field phenomena and artefactual assemblages that have been brought to light during motorway excavations continuing even today. This work also yielded real treasures and contributed rare finds to museum collections. Fortunately the developers involved in the construction of the Hungarian motorway system consider the preservation of archaeological heritage important, as is shown by the fact that their offices are decorated with posters showing photographs made during the rescue excavations. In spite of the initial conflicts of interest, archaeologists and investors have also become united in an emotional partnership as the work progressed.

A genuine cooperation between archaeologists, environmentalists and motorway constructors has been achieved at the middle Neolithic settlement at Polgár-Ferenci-hát. An open-air museum was established in the proximity of Motorway M3 at the edge of the Hortobágy National Park on the left bank of the Tisza River. This archaeological park (fig. 9.12) presents past architectural features (earthworks, houses, open-air workshops) as well as an exhibition within the setting of the Hortobágy natural environment. Together with a restaurant, an open-air stage, it could be developed into a leisure center in a region of Hungary where such cultural investments are rare.

In summary, the archaeological investigations linked to the Hungarian motorway construction resulted not only in the renewal of the discipline, but also in the emergence of a distinctive new approach reflected in the interaction between developers, archaeologists and the wider public.

The academic analysis of excavation results would be far beyond the scope of this paper aimed at the presentation of changes in methodology. The last 20 years have posed one of the greatest challenges to Hungarian archaeology, stimulating the development of modern, European-level solutions, good practices, several cited in this article. Our profession has tackled this challenge successfully by adopting to the pressing circumstances. Currently a 1300 km total length of motorways is available in Hungary. Another 1200 km section, however, still awaits construction (fig. 9.13).

It is sincerely hoped that our learning process has not ended yet. Hungarian archaeology still faces problems

to be solved by developing new methods. Considerable archaeological knowledge has already been generated affecting the historical interpretation of several archaeological periods. This body of information will become really profitable if, beyond scholarly publications, it will be incorporated in the university curriculum, contributing to the education of new generations of present and future archaeologists.

Epilogue

In recent months significant changes have taken place, the heritage legislation has been modified. The new regulation declares that in the case of investment-led archaeological excavations, the trial excavation must be carried out within 30 days. Subsequent rescue excavations are limited to a maximum of another 30 days. Moreover the costs of excavations may not exceed 1% of the total budget of the development project (at most 200 million HUF, c. 650,000–700,000 EUR). Those sites (sections of sites) which cannot be explored – due to budgetary constraints – must be recovered, which means that following the removal of the humus surface the observed archaeological phenomena should be documented. Should the expenses exceed 1% of the development project, the government could decide on expanding this budget if “the site is of outstanding importance as an irreplaceable source of the country’s past; or the recovery/reburial is technically impossible due to the nature of the investment; or the recovery/reburial would cause physical deterioration of the site.”

The other major change was the restructuring of the county museum system. At present, these organisations have been assigned from local governments to the recently established county offices of the central government. We do not have any experience on the consequences of such changes yet, but we strongly hope that the archaeological heritage will not be endangered.

Notes

- ¹ Archaeological Topography of Hungary. The first volume was published in 1966, the last, tenth volume in 1998.
- ² During the 1980s major excavations were carried out during the renovation of Árpád bridge in Budapest. Expanding the bridge head on the Buda site effected the former Roman legionary camp of *Aquincum*, the capital of the province Pannonia. The southern wall and associated gate of the camp could be reconstructed. The ruins could be successfully incorporated into the Flórián Square pedestrian subway. The ruins were conserved in a small park near the southwestern exit.
- ³ The joint entry sections of Motorways M1 and M7 to Budapest, comprising of a 2 + 2 lane express road, were inaugurated in 1964.
- ⁴ E.g. the site of Győr-Szabadrét-domb where a total of 935 features were excavated over a surface of 4.5 ha.
- ⁵ E.g. during the course of preventive excavations on Motorway M3, where 7 ha of the 22 ha large medieval village of Muhi were affected by the motorway construction, but ultimately only 1.5 ha could be excavated.
- ⁶ After 2005 this organization was called the National Motorway Consortium. It was replaced by the National Infrastructure Development Consortium in February 2007.
- ⁷ Law CXXVIII/2003 concerning the public value and development of the motorway network in the Republic of Hungary.
- ⁸ <http://istar.okm.gov.hu/kiadvany/?order=name&osap=1946&year=2005> Architectural heritage, tables 1–4. Statistics published by the ministry on the internet: <http://istar.okm.gov.hu>. The aim of data gathering was the mapping of performance by public collections, including museums. Following 2005, the lists contain data concerning the numbers of archaeologists and other specialists, incomes, certain aspects of the infrastructure, the materials inventoried and conserved. Last but not least, information is available concerning research and development, publications, exhibitions and other aspects of public relations.
- ⁹ Relevant references in *Magyar Múzeumok* 2007/1 (in Hungarian with English summary): Tari, E.: Egy milliárd négyzetméter régészeti feltárása az Mo-s környűri területén; Zsidi, P. & Reményi, L.: A Budapesti Történeti Múzeum kutatásai az Mo-ás autópálya keleti szektorán; Anders, A.: Megelőző régészeti feltárások az M3-as és M35-ös autópályák nyomvonalán (2003–2006); Somogyvári, Á.: Nagyberuházások és régészet Bács-Kiskun megyében (M5); Ódor, J.G.: Beszámoló az M6 autópálya Tolna megyei szakaszán végzett megelőző feltárásokról; Nagy, E.: Az M6–M60 gyorsforgalmi út Baranya megyei szakasza (2005–2006); Honti, S.: Régészeti kutatások az M7-es autópálya nyomvonalán Somogy megyében; Vándor, L.: Régészeti feltárások az M7–M70-es autópálya zalai szakaszán; Csányi, M., Tárnoki, J. & Polgár, Z.: A Vásárhelyi-terv továbbfejlesztése I. üteméhez kapcsolódó feltárások Jász–Nagykun–Szolnok megyében; Szörényi, G.A.: Régészeti kutatások a cigándi árvízi tározó területén (Pácin-Alharaszt); Kocsis, L.: A tiszaroffi víztározó gátjának nyomvonalában végzett megelőző régészeti feltárásról.
- ¹⁰ Since 1994, the Budapest History Museum has published short excavation reports in its own series called “*Aquincumi Füzetek*” (Aquincum Notebooks).
- ¹¹ The full series of data was made available by István Ecsedy, whose help is acknowledged here.
- ¹² Grateful thanks are due to Edit Tari who provided detailed information.
- ¹³ Data provided by Károly Belényessy of the Field Service of Cultural Heritage, whose help is gratefully acknowledged here.

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10 | The past and present of large-scale excavations in the Czech Republic

Martin Kuna and Zdeněk Smrž

Abstract: The main facet of large-scale archaeological projects is the appropriation of archaeological record in particularly large spatial segments – therefore, the very concept of space and its significance for the archaeological knowledge, itself changing in time, plays a crucial role. The first large-scale excavations in Czech archaeology started as pure research projects (called “systematic” as opposed to “rescue” interventions) in the 1950s and were mostly driven by the effort to excavate “the whole” of a site. The whole of a site was believed to provide a new quality of knowledge that would never be provided by just “a part”. Needless to say, only sites rich in artefacts and well preserved, mainly settlements and cemeteries, were considered.

During the 1970s and 1980s Czech archaeology was facing a new phenomenon: large-scale rescue projects in the opencast mining areas in north-western Bohemia. In order to cope with this challenge, Czech archaeology had to develop in two ways: first, it had to consider areas larger than a site and, second, it had to learn to employ sampling procedures. The concept of microregion, for example, has been articulated, meaning a large but geographically closed part of landscape where the relations among sites may be studied and that can serve as a model for other areas that cannot be excavated because of the lack of money and time. This approach meant an important step forward but it was still partly rooted within the traditional theorems, neglecting, for example, the less obtrusive sites and paying little attention to the ecofactual record, environmental questions, etc.

The 1990s brought not only the definite abandonment of “systematic” excavations, but also several large projects of landscape archaeology carried out by means of the non-destructive field methods. These projects disclosed landscape as a continuum of information and found the theoretical support within the theory of settlement (community) areas. Such a perception of archaeological record widened the research agenda and contributed to a gradual change of the archaeological paradigm. Not only typologically classifiable artefacts and their clusters (sites) were acknowledged as worth attention, but also issues such as surface artefact scatters, residual fragments, ecofacts, nature features and even the evidence of “negative observations”.

Today, the main problem of large-area excavations in the CR is the lack of clear research questions. In the pursuit of efficacy of rescue field interventions, often joined with commercial profit, the danger appears that archaeology will be reduced to just a set of logistical and technical problems.

Large-scale excavations are undoubtedly one of the most significant methods of archaeological research. Continuous excavations over large areas yield numerous finds, enable monitoring of their spatial relations, the quantification of logical units of archaeological sources, their development in space and time, etc. The issue of large-scale excavations, however, cannot be reduced to a simple proposition such as “the bigger the better” – if this were the case, this conference would make no sense. This is because large-scale surveys can be conducted using various methods, various aims can be pursued and various parts of the field’s capacity can be devoted to it. Large-scale excavations can be assessed from the viewpoint of the archaeological heritage management (research vs. rescue), specialist aims, field methods and management of own fieldwork, finalisation and publication, including questions regarding the permanent storage and preservation of finds. In this context, they can be assessed and planned as a tool for resolving specialist questions.

1.

The phenomenon of large-scale excavations appeared in Czech archaeology more or less for the first time in the 1950s, and there were both specialist and political causes for its inception and development. The Czechoslovak Academy of Sciences was established in 1953 on the Soviet model and concentrated practically all theoretical research in scientific fields. Three Institutes of Archaeology were formed as a part of the Academy – two in today’s Czech Republic (Prague, Brno), and the third in Slovakia (Nitra). Their main task was basic research in the field of archaeology; the duty to administer a central archive of field documentation and to supervise the specialist standard of all fieldwork in the country was transferred to the archaeological institutes from the older organisational structure of the discipline – although at the time, these were not especially large tasks, as the institutes themselves employed the majority of archaeologists active in the field and also performed the majority of large excavations.

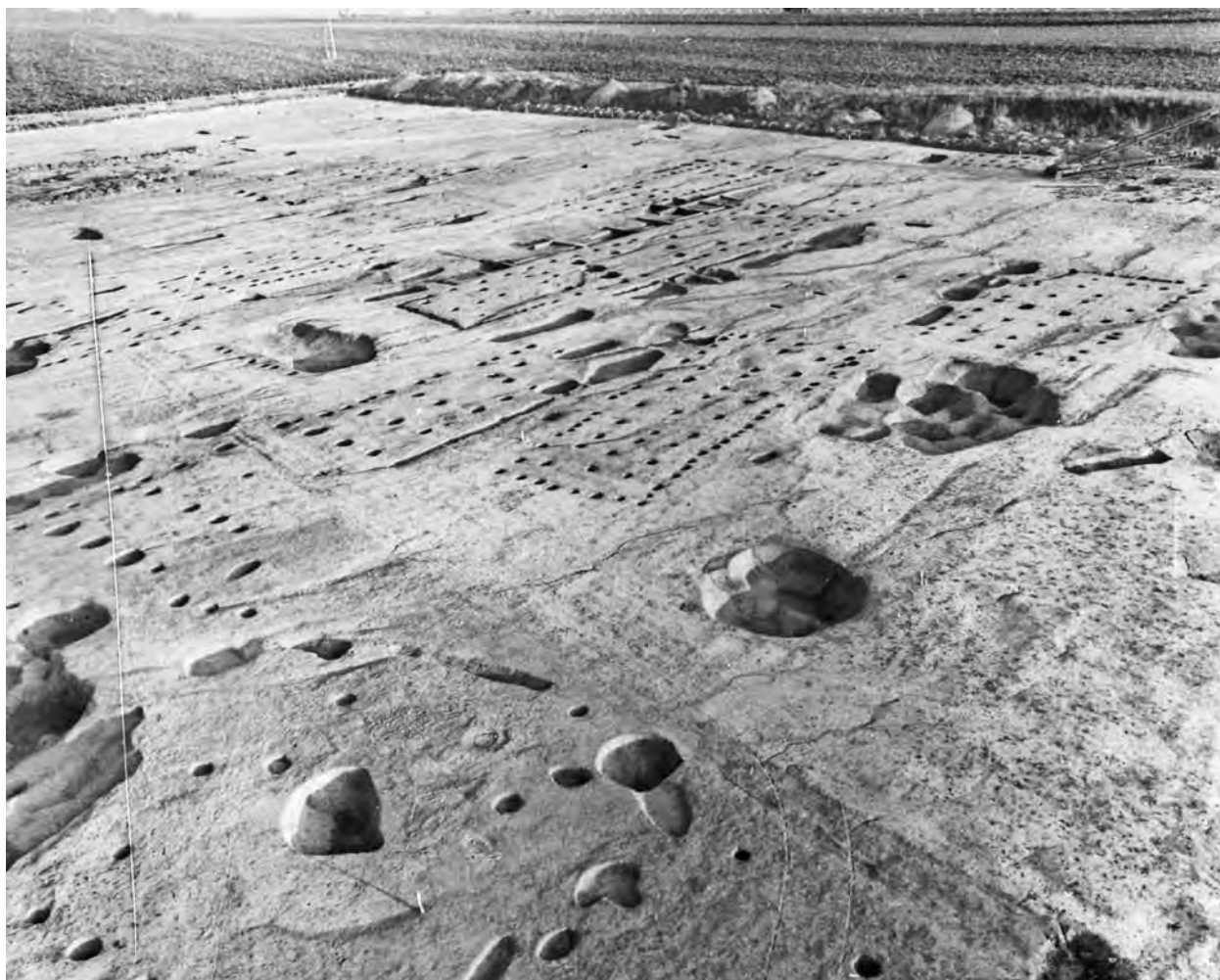
Leading archaeologists at that time managed to take advantage of the new situation to start wide-ranging field projects. The regime was relatively generous with the financing for these projects, because political capital could be gained from them. It cannot be claimed that the large-scale excavations were carried out in direct response to a political order, but some of them served the communist regime well through the presentation of the success achieved and other goals. For example, the results of large-scale excavations at Great Moravian fortress settlements were used as an argument to prove the cultural development of the Early Medieval Slavic populations in Central Europe and their ability to create an independent state; the research into La Tène oppida was then presented to the whole world at the UISPP World Congress in Prague in 1966 as an example of the new political system's success in science, etc.

The large-scale excavations in the 1950s and 1960s were planned as "systematic". This term was formulated as the opposite to "rescue" surveys. It was believed that only a systematic approach could lead to the relevant knowledge that was expected from a research facility. "Systematic" excavations took place, without exception, at locations that were not endangered, where permanent bases were built, and were usually planned not for years, but for decades. The main issues resolved

basically corresponded to the cultural historical paradigm of the time: these primarily concerned the age and periodization of cultures, their origin, etc.

"Systematic" excavations of archaeological sites obviously assumed a slow and careful approach, but were by their nature basically more extensive (the aim was to examine a large area, a quantity of features) than intensive (focused on searching for new methods, new types of artefacts and ecofacts, etc.). The main method of "systematic" excavations was the uncovering of the largest continuous parts of a certain component (a chronologically and functionally defined set of finds at one locality; fig. 10.1), preferably whole components understood, however, as primarily in their artefactual, typologically marked form (as a set of features and finds). It was believed that the excavation of an entire component would lead more or less automatically to information on the original size of communities, their social structures, trends over time and other matters. Usually, little attention was paid to questions that were outside the framework of this paradigm, i.e. outside the framework set by a typological and chronological analysis of artefacts. For this reason, for example, layers and feature fills were not floated or sieved, finds in the topsoil were not monitored, and surface collections and other methods of non-destructive research were not used much (with a few exceptions: fig. 10.2).

Fig. 10.1: Large-scale ("systematic") excavation on the Neolithic site of Bylany, Distr. Kutná Hora (Central Bohemia). View of Section F with ground plans of the LBK houses (photo Lapáček 1967, Archives of the Institute of Archaeology ASCR, FT-40260).



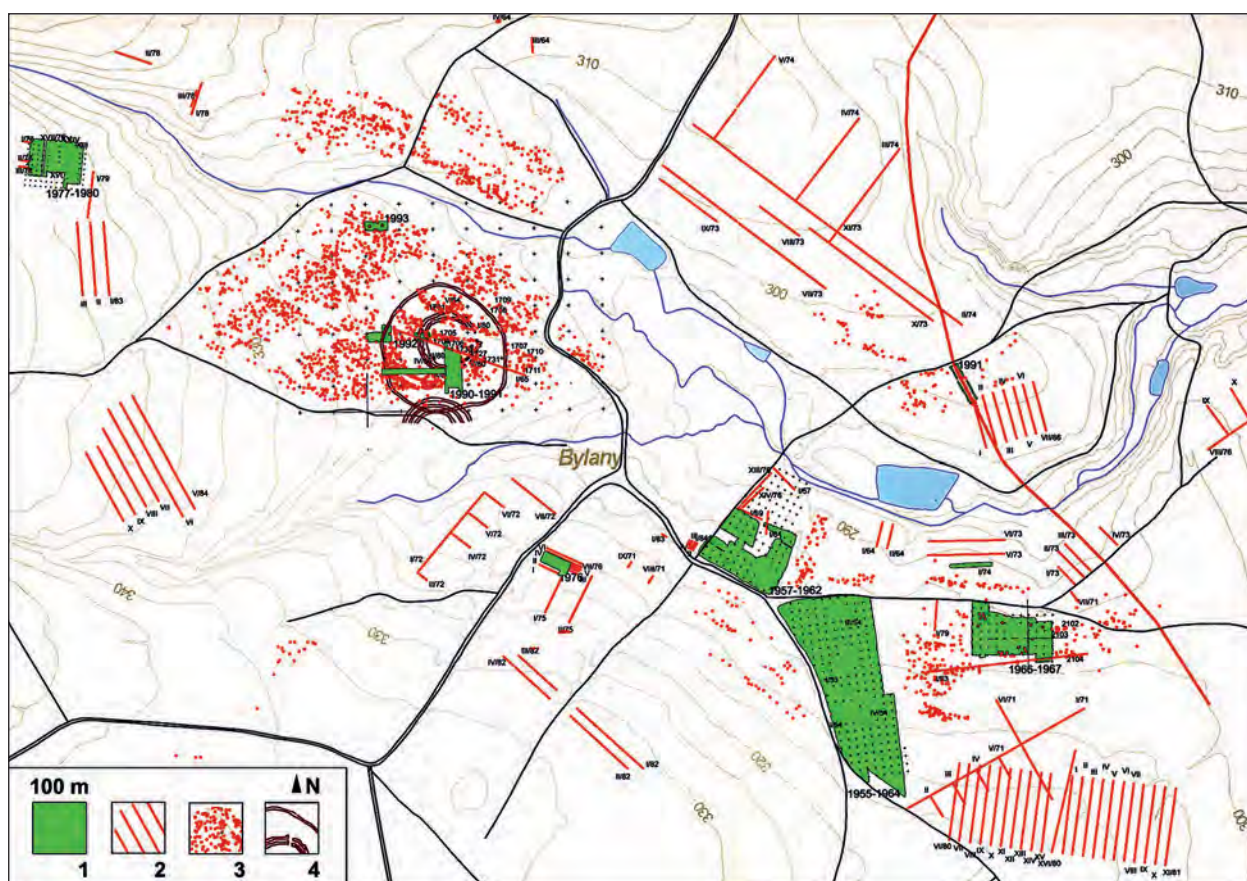


Fig. 10.2: The map of the Bylany research area, including large-scale excavations, test trenching and surface survey on the Neolithic site and its settlement area (1953–1993). 1: excavation trenches; 2: test trenches (rills); 3: features identified by surface survey; 4: ditches identified by magnetometric survey.

One phenomenon that accompanied “systematic” excavations was also the little attention paid to the opportunities for future research, as well as questions of the heritage protection of sites. For example, sacral buildings at the acropolis of the Iron Age hill-fort of Závist – representing the oldest, unique architecture of the prehistoric age – were uncovered more or less entirely, without the possibility of review research in the future. The definitive removal of the top layer of soil also greatly complicated the future preservation of buildings, which could have taken place only decades later, at high cost and after partial damage to the uncovered structures.

The long-term nature of “systematic” excavations also led to relatively little pressure for the compilation and publication of results. The problems of interpreting results – which always exist – were therefore primarily dealt with by further extending and expanding excavations, with reference to future finds that would provide a new viewpoint. The empirical approach to fieldwork was related also to another illusion, which many archaeologists are still under – the conviction that finds in a depository can wait for future interpretation: If it is not possible, due to other priorities, to process the results of an excavation immediately, it does not matter, because future generations – who will not be as busy – will appreciate the finds and will deal with them as well as, or even better than, the generation that took them out of the ground. However, this was not confirmed by the archaeology of subsequent decades: finds in de-

positories are losing their value not only due to physical decay, but primarily due to the aging of the questions that were the reason for them being gathered in the first place. Both the aforementioned illusions, however, in practice led to a situation where the publication of many “systematic” survey projects came so late that developments in the field had meanwhile moved towards other questions, and in many other cases the results will never be processed.

The system of assessment and support for science in the countries of the Soviet bloc was based primarily on planning, proclaimed results and a researcher’s political loyalty. The principle of cognition as an iterative process that should be structured into shorter cycles (projects) was not applied in Czech archaeology at that time and from the end of the 1960s the negative consequences of separation from contemporary world trends became more and more evident. Nevertheless, Czech archaeology had yielded some extraordinary results even under these conditions. They included, for example, the world-famous excavation at the Neolithic site in Bylany u Kutné Hory, which inspired a number of other field projects and schools, for example the French school of Neolithic research, the Aldenhovener Platte project in the Rhineland, etc. (Pavlů 2008). Other significant results, mostly inspired by large-scale excavations, included, for example, the model of cyclical shifting agriculture (Soudský 1966), the identification, periodisation and socioeconomic characteristics of the Eneolithic period (Neustupný 1956; 1967; 1969), ascer-



Fig. 10.3: Excavation of the southern wing of Gate D at the Iron Age hillfort of Závist in 1968 (photo L. Jansová, Archives of the Institute of Archaeology ASCR, Prague, FT-41489).

taining the structure of development at La Tène oppida (Drda & Rybová 2008; here: fig. 10.3), the archaeological definition of the oldest Slavic culture (Pleinerová 1965; Pleinerová & Zeman 1970; the overall publication of the excavations in Březno u Loun appeared, however, much later: see Pleinerová 2000); information about centres of the Early Medieval state (e.g. Poulík 1975) or the model of settlement and economic transformation in the High Middle Ages (Smetánka 1965).

2.

The end of the 1960s brought hope and subsequent disillusion, and started up the second stage of the communist regime in the Czech Republic (then Czechoslovakia) – the stage of resignation regarding ideals and the regime's persistent attempts to cling on. The contradictory conditions of the previous period more or less continued in archaeology: on one side generous, on the other limiting. The conditions and determination to take on new large "systematic" survey projects were lacking; the impulse for the further development of the field research, however, came from elsewhere. Paradoxically, this significant shift was caused by the largest devastation of the cultural landscape and historical heritage that the Czech lands had ever experienced. Large-scale opencast brown coal mining began at this time in north-western Bohemia. This was brought on by the needs of the communist regime to save it from the then-current economic decline. From the beginning of the 1960s until today, opencast brown

coal mining in north-western Bohemia has destroyed over 600 km² of the cultural landscape, the whole region's environment was seriously damaged, and over 60 historical villages and even two Medieval towns (one of which was the Royal City of Most, which had a population of thirty thousand) disappeared from the earth's surface. The landscape between the Krušné hory (Krušné Mts.) and the České středohoří (Bohemian uplands), which J.W. Goethe had written was the most beautiful in Europe, started to disappear in front of archaeologists' eyes (fig. 10.4).

The communist regime clearly did not allow any discussion about the legitimacy of its approach, but was willing to pay for archaeological research. The Institute of Archaeology in Prague was logically entrusted with this task and performed it through its branch in Most (Brüx), which had been established in 1953 as an office for rescue survey work and which grew significantly since the 1970s. A significant breakthrough took place in 1972, when the archaeological fieldwork (but not the processing of finds, etc.) started to be financed by the state organisation Severočeské doly (North Bohemian mines), and the situation further improved after 1991, when the various mines started, in accordance with the law, to finance not only fieldwork, but also the basic expert processing of the results in the form of fieldwork reports. Based on the Most branch, an independent *Institute for Archaeological Heritage Management of North-West Bohemia* was established in 1993.

It was, however, soon clear that despite the finance for the research in the brown coal mining district from the state mining company, neither the Most branch nor

Czech archaeology as a whole had the capacity to cover the disappearing landscape fully, partially because most capacities of archaeological institutes attached to the Academy were still tied to long-term systematic research. In this situation, within a short time the idea crystallised to concentrate financial and research capacities only on the parts of the destroyed territory whose research would have to be regarded as a priority rescue of a sample of sources being destroyed. This, however, did not mean that archaeology resigned itself to not performing rescue interventions outside this area. To a certain extent, however, the processing of their results was blocked, as the number of technical workers was limited. To date, depositories still have hundreds of boxes of finds from wide-ranging and once potentially beneficial excavations that will evidently never be published.

No matter how much of a compromise priority research in selected areas was, one positive aspect of it cannot be overlooked: in order that it was possible to select a representative part, it was necessary to formulate the aims that our work was supposed to achieve, estimate the landscape's archaeological potential, define the research questions and choose the methods that could lead to their resolution. In comparison with the previous, mostly empirical approach to fieldwork, this partially deductive model of gathering information was a significant step forward. An important step in the question of strategy for large fieldwork projects was the formulation of the term "microregion". A microregion meant a coherent geographic and archaeological unit larger than one site in which it was possible to monitor the chronological and spatial relations between communities, relations with the natural environment, sources of raw materials, etc. The catchment areas of small watercourses were usually

defined as microregions. Three microregions were progressively identified (the valleys of the Lužický Stream, the middle part of the Hutná River and Lomský Stream; fig. 10.4: polygons no. 1 and 2) and researched first and systematically, albeit in conditions relentlessly dictated by coal mining (fig. 10.5). Excavations of the museum in Teplice on the area of the external spoil bank of Bílina Mine (Lukovský Stream valley; see fig. 10.4: polygon no. 3) were performed on a similar principle (Waldhauser et al. 1986). The space in the selected microregions that was examined archaeologically totalled tens of square kilometres.

The project for the survey of Pětipeská basin, which has an area of 350 km² and in which a new opencast mine was to be opened (which luckily did not happen), was methodologically new in nature. The project was formulated by Z. Smrž (1982) and was different to the other projects because the actual excavations were preceded by systematic surface survey. The technical options, however, limited the research methodology here and, after mining was scaled back, the project was not brought to its conclusion (only an Early Medieval settlement on about one third of the area was published: Meduna & Černá 1991).

The settlement archaeology of H. Jankuhn was a significant inspiration for North Bohemian archaeology, whether it was drawn from the original source (Jankuhn 1955; 1977) or from work that was inspired by it in other countries, e.g. in Poland (Kruk 1973; 1980). Attention was paid to theoretical questions such as settlement density and the size of prehistoric communities, the impact of their activities on the natural environment (erosion, accumulation: Neustupný 1987; Beneš 1995) and mechanisms of progressive use of the landscape, i.e. in the form of the prehistoric settlement rotation model, based on

Fig. 10.4: Map of NW Bohemia showing the spatial extent of the opencast mining areas in the 1970s and 1980s and the microregions of special archaeological interest.

- 1: Lužický Stream and Hutná valley;
- 2: Lomský Stream;
- 3: Lukovský Stream.

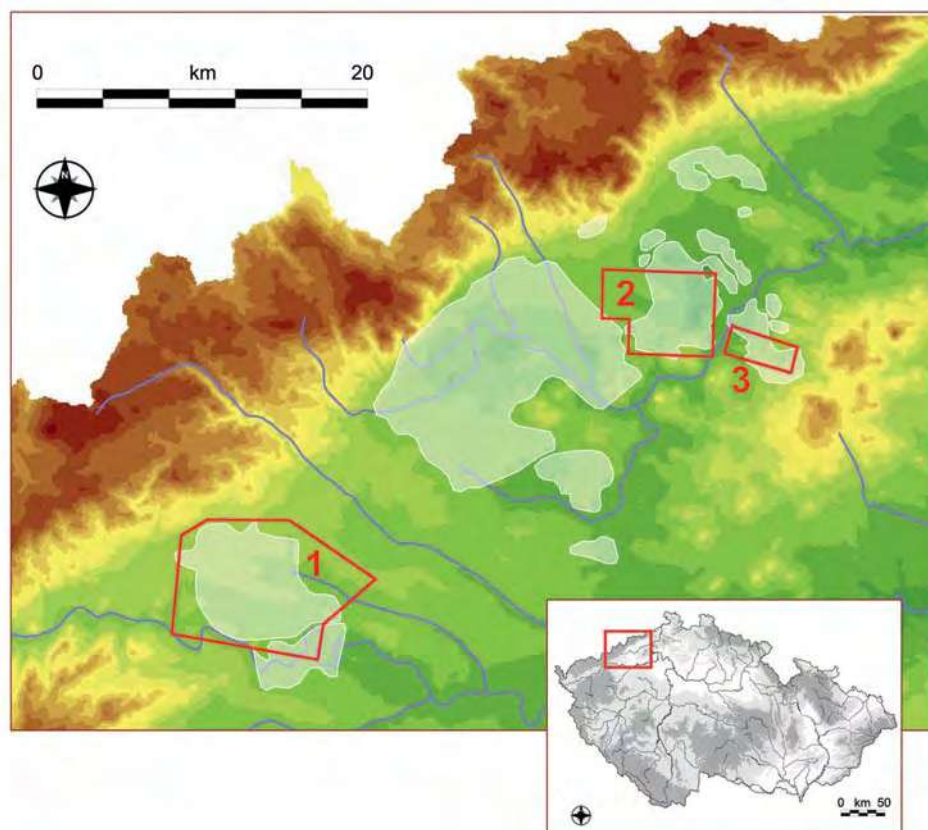




Fig. 10.5: Rescue excavation of the Corded Ware cemetery at Čachovice, Distr. Chomutov (NW Bohemia). The site of Čachovice was situated within the Lužický Stream microregion totally destroyed by coal mining. Continuous excavations here extended up to several square kilometers. The feature on the photograph is a Corded Ware grave within a circular ditch (photo Z. Smrž, Institute of the Archaeological Heritage Management of NW Bohemia, Most).

excavations in the Lužický Stream microregion. One of the peaks of settlement archaeological research by the Most branch in the 1980s was the conference “Archäologische Rettungstätigkeit in den Braunkohlengebieten und die Problematik der siedlungsgeschichtlichen Forschung,” which was held in Most in 1986. The primary results of large-scale excavations in north-west Bohemia were presented at the conference in confrontation with similarly focused excavations in the mining districts in the Rhineland, Upper and Lower Lusatia, Saxony, Saxony-Anhalt and Great Britain (Černá 1987).

The theoretical and methodological progress of North Bohemian archaeology in the 1970s and 1980s was also significantly linked with the thoughts of E. Neustupný, a leading theoretician of Czech post-war archaeology and the head of the Most branch before 1966. In the 1980s, as a worker for Prague’s Institute of Archaeology, E. Neustupný formulated his community area theory (Neustupný 1986), which generalises some specific findings of large-scale excavations and formulates a number of elements analogical to the processual paradigm in American and West European archaeology. The theory’s core is based on the idea that archaeological sites are understood as being part (the remains) of settlement areas, i.e. areas belonging to various prehistoric communities. Community (settlement) areas comprise many activity areas with various functions (habitation, funerary, storage, fields, pastures, etc.), which we always have to assume, even if they are archaeologically invisible. In archaeological sources, activity areas appear as components, i.e. sets of spatially, chronologically and functionally uniform artefacts and ecofacts. The whole landscape was therefore structured in a certain way and this structure is reflected in a certain, albeit somewhat complicated, way in the structure of archaeological sources and is decipherable from it. Prehistoric communities were usually small and stable in space for a long period of time. The community areas theory progressively influenced a large part of Czech archaeology and still makes up its theoretical and terminology base. The relationship between Neustupný’s theory and parallel developments in the western world is in itself an interesting topic for future research into the field’s history.

3.

The political changes in 1989 deeply affected Czech archaeology. One of the first and most marked changes was the almost immediate halting of all “systematic” excavations at unthreatened archaeological sites; with occasional exceptions this is still the case today. In Czech archaeology, research at an unthreatened site became a symbol of ineffective waste of archaeological heritage (Kuna & Klápště 1990); archaeologists of the middle and younger generations entered the 1990s with the conviction that all specialist aims were achievable through rescue research in the conditions of a construction and mining boom and, if not, research projects at unthreatened sites should be an exception, limited in spatial extent and focused on resolving specific questions.

Another requirement logically resulted from this atmosphere: a new appreciation of non-destructive methods of archaeological fieldwork. It was pointed out that non-destructive methods are not only kinder to the archaeological heritage, but also cheaper than large-scale archaeological excavations; in addition, they are irreplaceable for many current issues. The questions that archaeology had in mind then resulted primarily from the settlement archaeological research that started earlier and from the inspiration of British landscape archaeology (settlement patterns, subsistence strategies, population density, etc.).

The new situation enabled, for the first time in the Czech Republic, the intensive use of aerial surveys (Bálek 1995; Smrž 1996; 1999a; Gojda 2004) – the Institute of Archaeology in Prague became one of the few European archaeological institutions equipped with its own aircraft. Surface artefact collection methods developed quickly, although until then Czech archaeology had left them to one side as a hobby for amateurs. In the middle of the 1990s, projects were implemented that mapped large-scale sections of the landscape using surface artefact collection (Kuna et al. 1993; Neustupný & Venclová 1996) and the method of analytical surface surveys was defined, closely linked to GIS data processing (Kuna 1994; 1998a; 1998b; 2004).

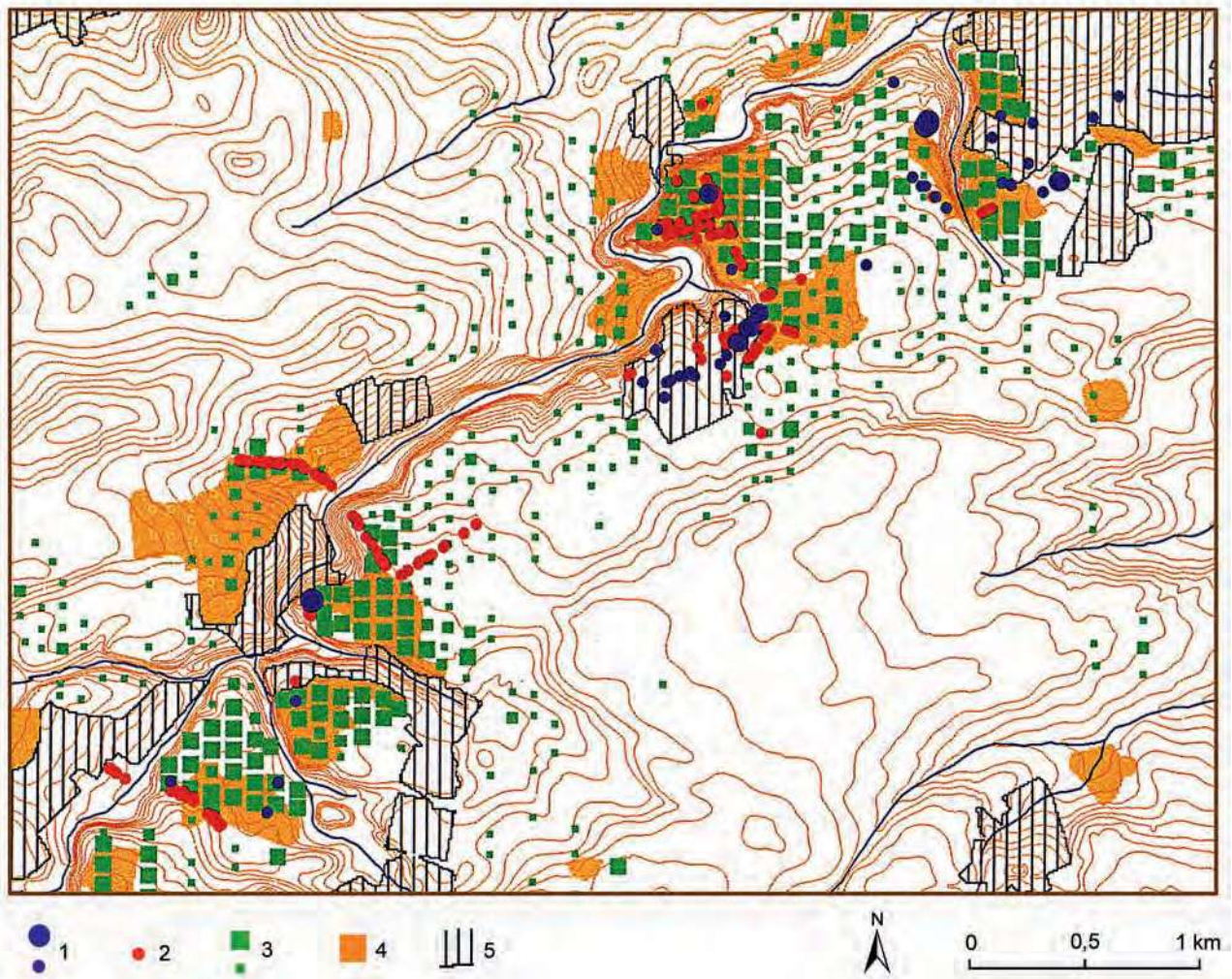


Fig. 10.6: Spatial continuity of prehistoric remains in the landscape. 1: earlier chance finds and small rescue interventions before 1986; 2: rescue excavations in 1986–1990; 3: sites identified by traditional surface artefact survey in 1986–1990; 4: results of the analytical surface survey (grid walking) in 1996–1997 (the size of the squares corresponds to the number of prehistoric pottery fragments within the survey unit of 100 m x 100 m); 5: built-up areas. – The map documents an almost continuous spread of finds in the landscape and the differences in the patterns of finds obtained by different field methods (earlier small-scale excavations being entirely bound to built-up areas; traditional surface survey identifying only the large surface scatters, etc.).

The impact that the application of non-destructive methods had on archaeology in the Czech Republic was fundamental and in some aspects changed the view of archaeological sources and the bases of large-scale excavations. Whereas for archaeology until then (including excavations inspired by settlement archaeology) the base source had been only archaeological situations sunk into the subsoil or preserved under the topsoil and comprising clusters of artefacts, non-destructive archaeology stated the ubiquity and continual occurrence of archaeological sources in the landscape. It was found that the very concept of archaeological “site” was itself close to fiction and a consequence of the traditional approach to conducting field research (British archaeology had already pointed this fact out earlier: Gaffney & Tingle 1984; 1985).

Non-destructive methods of archaeological surveys captured the consistent occurrence of the remains of past activities on huge areas of the landscape and showed how selective fieldwork led only by traditional excavations or surveys could be (fig. 10.6). The surface survey also showed that not only artefacts, but also various types of ecofacts occur over large parts of land-

scape and have to be taken into consideration when reconstructing the former settlement structures. In this way, for example, the surface occurrence of iron slag and production waste from the manufacture of sapprolite bracelets was mapped, and the size and structure of specialised production zones in the Iron Age in Central Bohemia was proved (Venclová 2001).

Last but not least, it came to light that the archaeological image of a certain area is never definitive and is not even the result of the simple accumulation of empirical data, as was postulated, for example, in German settlement archaeology in the term *Landesaufnahme* (Jankuhn 1973). The picture with which archaeologists work, depends not only on the preservation of sources in a certain area (i.e. on specific archaeological transformations), but also on the methods that are used for data collection (fig. 10.6). The pictures gained from aerial archaeology, analytical surface collection and rescue excavations can be quite different – in some cases this provides even a complementary picture (Kuna 1998a). Work with data obtained by non-destructive methods would be ineffective, if not impossible, if it had not been accompanied by the rapid computerisation of the

entire field. While before 1989, the Institute of Archaeology in Prague had approximately 200 workers and one computer, whose use was strictly recorded, within a few years the institute was fully saturated with computers running modern software. As early as in 1992, the first use of GIS-type software took place here and a whole group of specialists began to apply it. GIS presented a tool that, in many respects, fulfilled researcher's dreams regarding settlement and landscape archaeology, mapping of archaeological heritage, etc. The first studies based on GIS implementation were soon written (Kuna & Adelsbergerová 1995) and a methodology for linking GIS and multivariate statistical methods was drafted (Neustupný 1996). Consideration was given to the topic of predictive modelling in archaeology, and the topic of the relationship between prehistoric settlement and the parameters of the natural environment was opened at a new level.

The 1990s also brought about significant developments in environmental research and with them came one of the large dilemmas for current large-scale excavations. This dilemma lies in the character of modern archaeological fieldwork offering an almost unlimited range of analytical methods, but – because of the costs – being applicable to selected archaeological sites and situations only. The dilemma is principally the same as in the 1970s, when defining microregion research – only the scale is different. Current fieldwork, for example, shows how useful it can be to have a detailed survey of finds in layers between the topsoil and sunken subterranean features, the type of source that until then had usually been removed by heavy machinery before the start of the survey itself. The problem is, however, that given the practical limits of funding, such survey covering one hundred square metres has to be paid for by losing hectares of unexamined area (Ernée 2008). The disturbing questions that archaeology asks are undoubtedly legitimate. Does archaeology really need large areas to answer the questions it is interested in? Does not large-scale excavation work lead to the collection of redundant data? Would it not be better to pay attention only to selected small parts of field situations, but with maximum intensity? If we cannot examine everything, how large a part of the source do we need in order to be able to estimate the whole? These questions are as current today as they were in the 1970s, but there are still no simple answers to them.

4.

There can be no doubt that Czech archaeology is profiting from the conditions that have applied since 1989: this is confirmed by its close links to international research structures, the expansive opportunities to travel and to exchange information, the increase in the number of university archaeology departments (from two in 1989 to eight today) and, to a marked extent, the scope and distribution methods of funding (e.g. through grant agencies). As the construction boom has lasted from the 1990s until today, "contract" archaeology is enjoying its golden age, although this could be changed by the looming economic recession that is on the rise. There are, however, still a large number of field excavations: vacant lots in the centres of historical towns and cities are being filled, as are, in particular,

large areas on their outskirts; residential units, and village and town bypasses are being built – all this leads to wide-ranging archaeological excavations on areas densely populated in prehistory and the Middle Ages. In particular with regard to large field excavations, however, this fact is not as ideal as it may seem. After 1989, the Czech Republic created very liberal conditions for the conducting of archaeological fieldwork. One result of this was the establishment of many organisations, both public and private, that were authorised to perform archaeological excavations. More than a hundred such organisations operate in the Czech Republic today and more are being established. Under the conditions of the construction boom and the statutory "polluter pays principle," "contract" archaeology is a relatively lucrative business, even though it is formally subject to the regime for non-profit organisations.

In the "post-revolutionary" atmosphere at the start of the 1990s, the entire archaeological community agreed that the privileged position of the institutes of the Academy of Sciences had a political background and should be ended. The reform of the Czech Academy of Sciences brought about a justified reduction at the archaeological institutes: while before the reforms the Academy's archaeological institutes employed over half of all experts in the country, today only around 16 % of a total of 425 professional archaeologists in the Czech Republic work at the two institutes (Frolík & Tomášek 2008). The Academy's institutes only retained some of their central roles in Czech archaeology, e.g. the duty to administer a central archive of field documentation, make statements on requests by organisations for the granting of a licence for field activity, and ensure the quality of archaeological fieldwork in the Czech Republic. While in the previous period it did not matter much that the institutes only had limited capacities for these "non-scientific" tasks (they did most of the fieldwork themselves anyway), currently – at a time when the institutes have lost capacity and the volume of fieldwork has, on the contrary, grown exponentially – the lack of capacity is a fatal problem. A specialised heritage management office – the National Heritage Institute – supervises locations that are registered on the list of cultural heritage sites, but there is only a negligible quantity of these in comparison with the total number of archaeological sites in the Czech Republic.

Another of the marked shortcomings is the absence of mandatory registration of archaeological field interventions. Many fieldwork projects are not reported at all, their documentation never makes its way to the central archives and any supervision of their quality is unrealistic. The financing of rescue archaeological excavations is also basically non-transparent. According to the law, archaeology must not be an object of business and the distribution of orders is therefore not officially the subject of free competition; orders are allocated based on agreement between organisations in regional commissions. On the one hand, an investor is therefore unable to choose an archaeological organisation and, on the other hand, there is also a lack of sufficient control of the price for which an organisation performs a rescue excavation. Therefore we often encounter – to the detriment of the whole of archaeology – dumping prices, as well as projects that are overpriced.

Current rescue excavations often acquire spatial dimensions that archaeology in the times of "system-

Fig. 10.7: Large-scale rescue excavation in the sand pit of Vliněves, Distr. Mělník (Central Bohemia). The view of the last remains of a sand-and-gravel terrace in the middle of the sand pit that has already been dragged off. Most of the features on the photograph are Early Bronze Age graves, the rills among them are test trenches searching for the less visible features. The whole excavation carried out during the last years covered more than 15 ha of a prehistoric landscape (excavation of P. Limburský, photo M. Gojda, Institute of Archaeology AS CR, Prague).



atic" excavations could not have even dreamed about (fig. 10.7). This fact, in connection with the "contract" context of their performance, often leads to fieldwork being understood as a technical and logistical problem, not as a solution for a specialist or scientific problem. Theoretical archaeology, nurtured for example at universities or institutes of the Academy of Sciences, and the archaeology of large-scale rescue excavations are creating two different worlds that interfuse only marginally. This is partially a reflection also of the general absence of "major" questions, characteristic for the archaeology of the post-modern era. Large-scale field excavations often lead to a technical report for the investor, but only relatively rarely to professional publication, because there is no capacity left for specialist assessment, and the relevant scientific questions are also lacking.

Czech archaeology was not prepared for the construction boom in the area of care for archaeological finds either. Organisations authorised to perform fieldwork have to have certain storage capacities, but under the law it is their duty to hand over finds to museums. These, however, very often reject finds, because they do not have space to store them and are not under obligation to accept finds. The intermediate stores of organisations active in the field are therefore filling up rapidly and the future of the finds is uncertain.

Despite these statements, it can be said that many of the large-scale excavations in the Czech Republic are still performed to a high standard, even though it would be desirable to rapidly commence with efforts to make changes in order to maintain it. In the near future, in our opinion, Czech archaeology has to fight for two things, in particular, (1) the introduction of an effective system of registering fieldwork activities and (2) greater application of specialist criteria during their selection and implementation. We will try to outline one of the examples of current large-scale projects – currently at the pre-excavation stage – in the closing chapter.

5.

Large-scale excavations in the brown coal mining district in north-west Bohemia are a significant tradition for Czech archaeology (see chapter 2), a chapter that can undoubtedly be built on even today. The mining of brown coal in north-west Bohemia was wound down after 1989 and final limits were set on its territorial scope (although they could be broken in circumstances of energetic crisis in the future). One of the areas where mining will continue for about 20 years is the space between the towns of Kadaň and Chomutov, one of the centres of the brown coal mining district in north-west Bohemia. Part of this space (Lužický Stream valley) became one of the microregions in which the rescue excavations in the brown coal district were concentrated in the 1970s. Mining in this space, currently managed by Doly Nás-tup Tušimice (Tušimice Mines), has affected an area of 42 km² since the beginning of 1960s. Zdeněk Smrž, the initiator of the comprehensive surveying of the microregions, started to research this area in 1975.

Brown coal mining provided a unique opportunity that, in many ways, shaped the methodology for archaeological fieldwork in the Czech Republic, in particular with regard to the surveying of large units of land. Some new principles for fieldwork were formulated for the rescue excavations here. Removal and disposal of the topsoil took place throughout the mining area – archaeology therefore obtained the chance to observe and document not only "archaeological sites" but also the empty space among them (E. Neustupný's empty components), which can complete the spatial context of settlement finds. Intrusions (mainly residual finds) in archaeological assemblages were also assessed carefully and often proved the presence of otherwise undocumented prehistoric cultures (cf. Kuna 2002); this information helped define the chronological context of the better visible components. The research also included the preparation of reconstruction maps, i.e. maps rep-

representing the landscape before the changes caused by the industrial revolution in the 19th century. These maps were created primarily based on the first military mapping (in the area in question in 1782), by which the whole territory of the Austro-Hungarian empire was covered, as well as on old mining maps; computer modelling has lately been used for similar tasks.

Despite these attempts, the methodology for the North Bohemian field excavations had some weaknesses. The excavations could always start after heavy machinery had removed the surface topsoil layer (its use for recultivation in another place is required by law). Together with it, however, any culture layer, shallower features and the potential surfaces of former activity areas had usually also been removed. These contexts are not often preserved, but if they are they usually represent very valuable information (Ernée 2008). In past years, surface collections and other forms of non-destructive fieldwork were not performed on areas intended for excavation – land that was to be mined was not cultivated in the last few years before mining, aerial archaeology was not permitted until 1989 and the general opinion was that the area would be excavated nonetheless, so preliminary information seemed to be redundant. A significant exception was the surface artefact survey at the Pětipeská basin (see chapter 2) where, however, after a change to the mining strategy, the subsequent excavation was not performed.

The mining area of Tušimice Mines, including the microregions of Lužický Stream and the River Hutná, is today the sole project continually ongoing since the 1970s and conceptually based on the survey of the microregions. Despite this continuity, research in this area is developing and responding to changes in fieldwork methods and paradigms. The currently non-existent Lužický Stream valley was a microregion with an area of 30 km², 10 km² of which were suitable for settlement. After the start of surface mining here in 1960 to 1974, 21 “common” rescue excavations of varying size took place here, and with its intensification between 1975 and 1984 there were another 14 excavations on a continuously excavated area of about 2 km² (Smrž 1987; 1991; 1994a). In the neighbouring valley of the Hutná, approximately 6 km² of ground were mined without the proper supervision of archaeologists, but from 1984 the area started to be systematically examined in the same way as Lužický Stream (Smrž 1999b). The area of systematically observed uncovering of topsoil in the Hutná valley today totals 14 km², and 48 excavations have been conducted on it; together with older projects in the destroyed area, there have been a total of 67 exposures. By 2030, the opencast mine in the Hutná valley will devour another 10 km² of practically untouched countryside, under which there are 210 million tons of brown coal. It is this area, naturally bordered by three watercourses, that is the subject of our project.

The survey methodology was influenced by advances in non-destructive archaeology in the 1990s in other parts of the Czech Republic, as well as by the fact of the continual but planned and limited disappearance of the cultural landscape, evidently one of the last (let’s hope) areas so designated in the Czech Republic. Over the next 20 years, the deforested and cultivated land offers a unique opportunity to compare the surface and subsurface archaeological reflections of the area – for the first time in north-west Bohemia and, to such an extent, for the first

time in the whole of Europe. A comparison of this type could not only enrich our ideas of prehistoric settlement in the given area, but, in particular, could lead to the acquisition of fundamental information for the methodology of non-destructive archaeology. Today we know, based on information from other areas, that the surface occurrence of artefacts and ecofacts can provide information about components that were not preserved at the level of subsurface features, i.e. both the settlement components of some prehistoric periods and out-of-settlement components (some production activities, the mining and the processing of raw materials, paths, etc.). Therefore, as a part of the Hutná project, analytic surface artefact surveys have been taking place in this area since 2007, the methodology for which was drafted by M. Kuna (2008). In 2007 to 2008, first archaeological rescue excavations have been carried out in the project area, following the tempo of mining, of about 0.7 km² a year.

The scheme for surface artefact survey was designed for the course of three years, during which a team of 4 to 5 people will be available for 10 to 20 days every year. The whole territory of the survey was divided into a grid of 50 m × 50 m, which makes 400 squares per 1 km² and roughly 4,000 units for the whole territory being studied (fig. 10.8). The centre of each of these units was defined by a pair of coordinates and it has been suggested that the selected units will be surveyed as circles (in circles) of 50 m in diameter (this is believed to be the simplest and fastest procedure based upon localising the centre and walking to a distance of 25 to 30 steps in different directions and back). It is expected that the available capacities for the project will be enough to survey some 500 to 1000 survey units during the project’s duration.

The basic sample of the survey units corresponds to a grid of units at a distance of 200 m; hence, one unit out of every 16 is walked (6.25 % of the total number of units). These units have been marked red. Additionally, a similar set of units has been marked yellow (also representing 6.25 % of the whole) and units between the red and yellow ones have been marked blue (12.5 % of the whole; fig. 10.8). In zones where the occurrence of archaeological finds is probable, both the red and the yellow set of units are surveyed; in areas where little can be expected, only the red units are walked. Anyway, if any prehistoric or Early Medieval find is found within a red or yellow unit, all the neighbouring blue units are surveyed as well and the survey of blue units goes on as long as any prehistoric and/or Early Medieval finds occur. This principle is called the sequential method of fieldwork; it was statistically reasoned and formally articulated by E. Nesutupný (1973); the relevance of this method is based upon the fact that archaeological finds and sites tend to occur in clusters (fig. 10.9).

The coordinates of all the units have been calculated in advance and stored in the memory of a GPS station. Field walking teams can then be navigated from one point to the other by the GPS, where the location of unit centres and the actual position of the field crew can be seen on its screen. Forms with the pre-printed scheme of the red, yellow and blue units are used for the recording survey units. Environmental research is an important aspect for assessing the relationship between the surface and subsurface archaeological picture of the landscape, as well as a general assessment of past settlement in the Hutná valley. In this regard, the survey of the Hutná valley of-

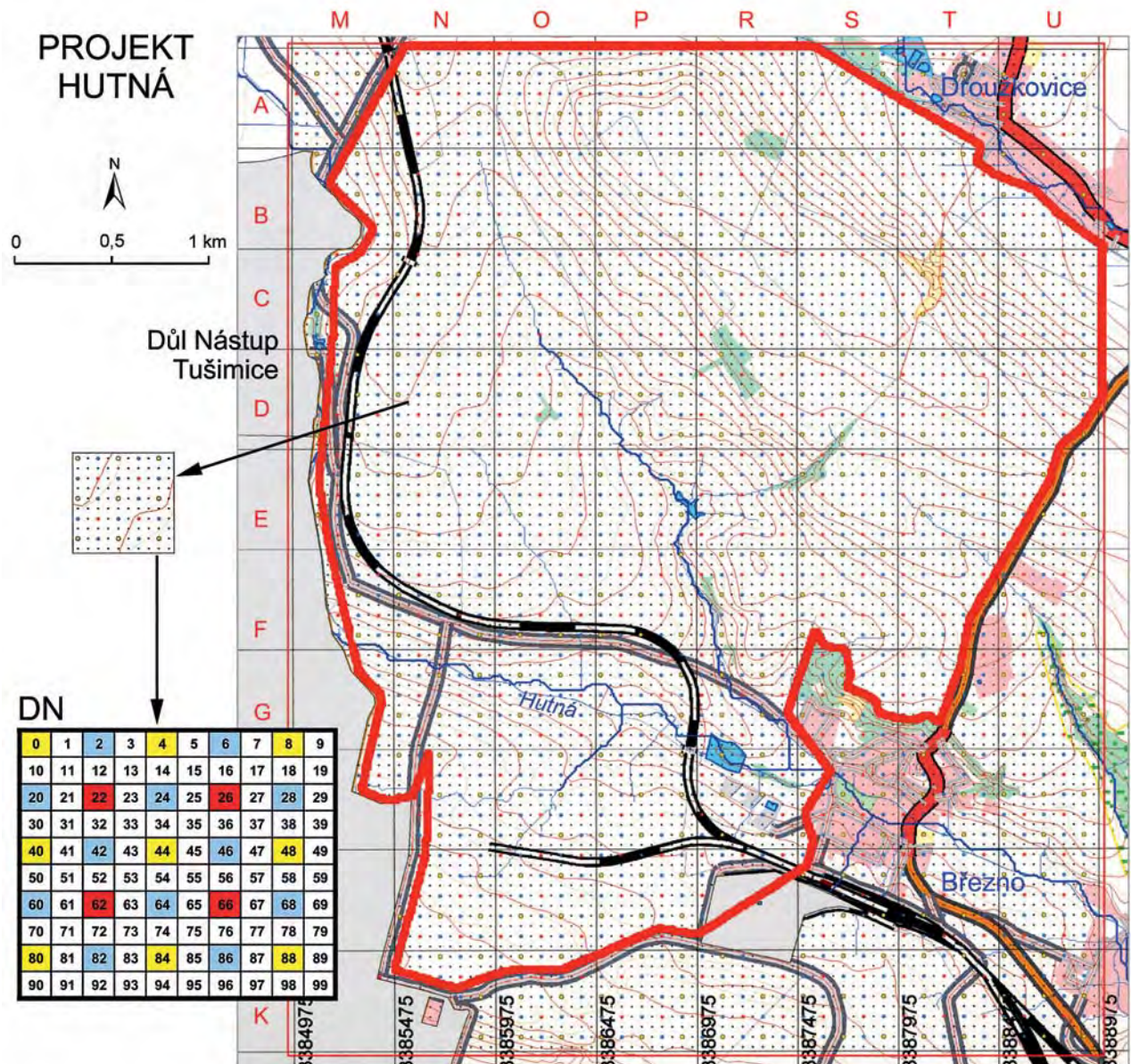


Fig. 10.8: Map of the Hutná project. The main goal of the project is to collect maximum information on the past settlement and land use of the area using non-destructive methods of fieldwork, mainly via surface artefact survey. The survey employs a strategy of sampling red, yellow and blue squares according to the both expected and observed occurrence of surface finds. The whole area of the project (c. 10 km²) will be excavated and mined off during the following 10 to 15 years.

fers new opportunities that the previous research did not enable (Neustupný 1987; Smrž 1994b; Kyncl 1987). The monitored phenomena include, for example, the thickness of the topsoil layer over the whole territory being surveyed, the intensity of soil erosion and accumulation in certain periods and on aggregate, changes to land use over the long term, etc. A series of aerial orthophoto maps taken by the mining company every year since 1991 serve for the identification of areas of soil erosion or accumulation, disappeared watercourses, field boundaries and other details. Information on the topsoil thickness in the whole area is provided by a map of bore data on a 100 m × 100 m grid prepared by the mine. An aerial survey performed by Z. Smrž since 1993 indicated the existence of at least three multicultural prehistoric settlement areas with a size of several tens of hectares. The progress of the mining creates sectioning of the alluvium and the whole river valley

(one of these is 640 m long). The layers of sediments in the section are ¹⁴C-dated, and soil analyses, pollen analyses, etc. are performed.

From the methodological viewpoint, it is very interesting to ascertain the intensity of soil erosion and accumulation, albeit in a relatively recent period. For example, in the last 30 years the intensity of soil erosion and accumulation caused by insensitive ploughing has been as high as to cover the remains of buildings demolished in 1975 by a layer up to 80 cm thick. In one of the sections, settlement layers from the Roman Period are buried under 1.5 m thick sediments of runoff and slope materials. Above them the stratigraphy was reversed, so artefacts from prehistoric features or graves found themselves on the surface of the current terrain. This observation, together with many others, may be of fundamental importance for the interpretation of surface collections in some cases.

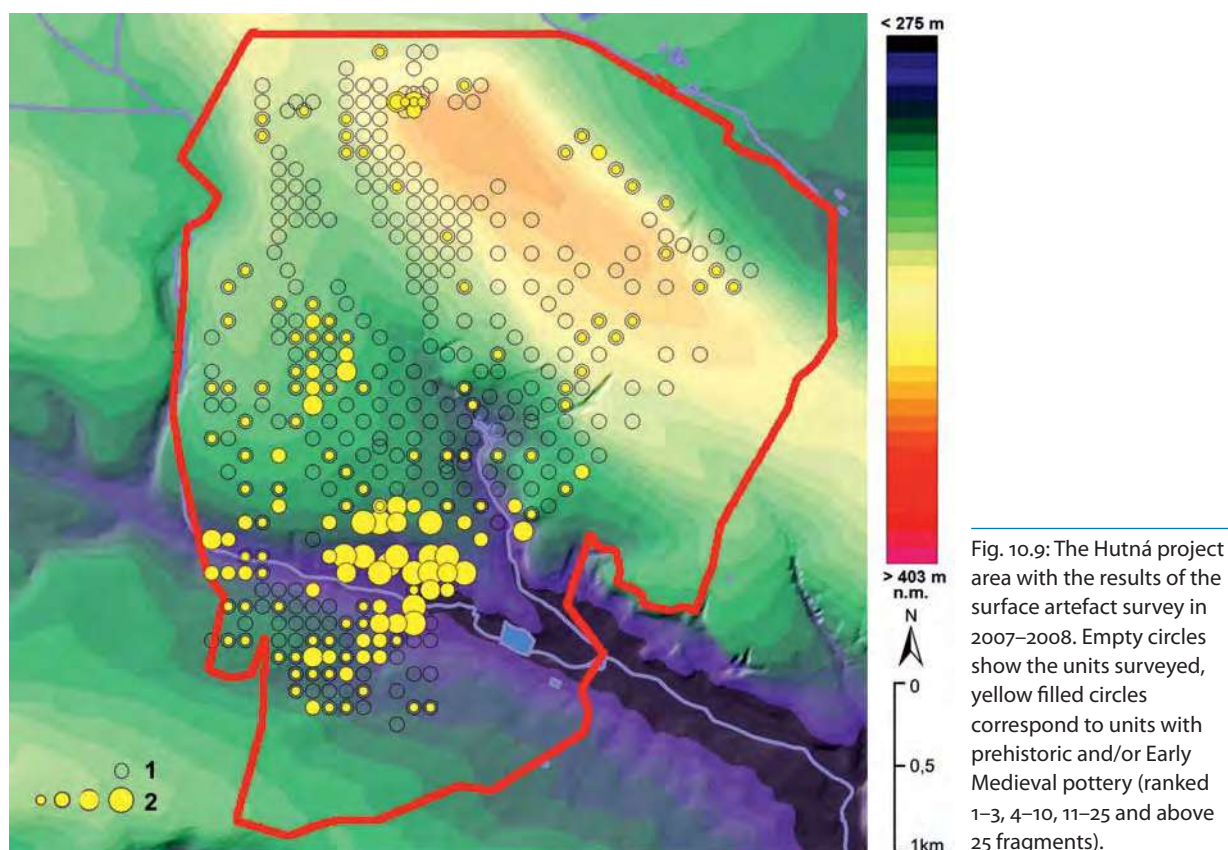


Fig. 10.9: The Hutná project area with the results of the surface artefact survey in 2007–2008. Empty circles show the units surveyed, yellow filled circles correspond to units with prehistoric and/or Early Medieval pottery (ranked 1–3, 4–10, 11–25 and above 25 fragments).

The analysis of the contents of heavy metals in the buried sediments led to the finding that the contamination of the natural environment with heavy metals in Roman times (2nd century A.D.) was, as a consequence of intensive iron production, higher than in 1960 to 1991, when matter was deposited from four nearby thermal station plants that did not have fly-ash traps and desulphurisation facilities.

6.

Large-scale archaeological excavations are an important element in the post-war archaeology of the Czech Republic. Our contribution looked at them in four chapters: from their beginnings as “systematic excavations” in the 1950s and 1960s, through the 1970s and 1980s, when the progressive element was, in particular, wide-ranging rescue excavations in the North Bohemian brown coal mining district, to the 1990s, when large-scale excavations were supplemented by elements of landscape archaeology, non-destructive methods and environmental archaeology. We attempted to mention some of the significant results of large archaeological excavations, as well as issues that were not resolved.

At the current time, the Czech Republic is still experiencing a construction boom, and with it a boom in the quantity of large-scale archaeological excavations. We tried to show that for the efficient use of the potential of current large-scale excavations, it is necessary to rapidly improve the quality of their overall management (e.g. introduce the duty of registration of survey projects and therefore the chance of effectively controlling the quality of their course and results), as well as again think-

ing through specialist questions to whose solution this work could contribute. This is because we believe that there is no methodology that would enable archaeological sources to be “objectively” documented and taken from the ground for their specialist processing in the future. On the contrary, in our opinion, fieldwork is an answer to a set of questions that the archaeology of the time in question regards (whether explicitly or implicitly) as significant – a future time, however, may not regard them as significant and the sources themselves will not answer the new questions.

In the last chapter, we reported on one extraordinarily large excavation project that became the subject of concentrated attention even before it began. In this way we are drawing attention to the importance of the alternative, non-destructive view of archaeological landscape. We believe that such a view creates not only a preliminary and orientational picture of what will then be found by excavation, but also a complementary picture, which can significantly supplement the information obtained by excavation.

Acknowledgement

This contribution was prepared as a part of the grant project *Archaeology of the disappearing landscape. Non-destructive survey of the area of the open-cast coal mine Tušimice*, supported by the Grant Agency of the Czech Republic, under No. 404/07/0989. Since February 2009, when this paper was submitted, the project has been finished and published (Smrž et al. 2011).

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11 | Die vorgeschichtliche Siedlungslandschaft am Beispiel von Großprojekten in Sachsen-Anhalt

Susanne Friederich

Sachsen-Anhalt – eine vielfach begünstigte Region

Sachsen-Anhalt reicht in seinen heutigen Grenzen von der Altmark – hier befinden wir uns geographisch oberhalb von Berlin – bis zum Zeitzer Lösshügelland im Süden (Abb. 11.1). Im Westen dominiert der Harz. Die Köthener Platte bzw. das sogenannte Anhalt schiebt sich bis fast zur renaissancezeitlichen Stadt Torgau zwischen die heutigen Bundesländer Sachsen und Brandenburg. Das an Grundfläche mehr als zwei Millionen Hektar umfassende Bundesland Sachsen-Anhalt mit seinen zehntausend Kilometer langen Fließgewässersystemen – zu nennen sind hier vor allem Elbe, Saale, Unstrut und Havel – zählt aufgrund zahlreicher weiterer phänotypischer Faktoren zu den überdurchschnittlich begünstigten Landstrichen Europas: Magdeburger Börde, Nordharzvorland, Querfurter Platte und viele andere mehr. Dadurch erklärt sich vor allem der hohe Anteil an Altsiedelland. Zudem lag seit Beginn der Sesshaftwerdung vor über 7000 Jahren Mitteldeutschland stets im Schnittbereich verschiedener Ausbreitungs- und Handelswege und wirkte oftmals quasi als Katalysator der Kulturentwicklung. Heute gilt die Region nach ökonomischen Gesichtspunkten weltweit als erste Adresse für Wirtschaftsansiedlungen, und beim Rohstoffabbau ist Sachsen-Anhalt bundesweiter Marktführer. Für die dichte archäologische Kulturlandschaft

bedeutet dies einen hohen Substanzverlust, eröffnet jedoch andererseits die einmalige Chance, die europaweit einzigartige Fundregion durch systematische Untersuchungen zu erfassen und zu begreifen. Allein während der letzten Jahre untersuchte das Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt über 1000 ha Fläche im Bereich zukünftiger Rohstoffgewinnung, 325 ha wurden im Zuge von Straßenneubauten vorab archäologisch dokumentiert, auf ca. 100 ha fanden Grabungen im Vorfeld von Leitungsverlegungen statt. Hochwasserschutzmaßnahmen, Industrieansiedlungen mit ihrem immensen Flächenbedarf etc. erforderten gleichfalls zahlreiche und teilweise großflächige Untersuchungen.

Großprojekte als Chance für die Wissenschaft

Der politische Schulterschluss beider Weltmächte vor 20 Jahren eröffnete nicht nur ungeahnte Möglichkeiten, sondern stellte auch viele neue Anforderungen, so auch an die Infrastruktur. Innerhalb nur weniger Jahre entstanden zahlreiche neue Verkehrswege. Gleichzeitig erfolgte ein umfassender Ausbau des Produktenleitungssystems. Einen Neubau von mehreren

Abb. 11.1: Sachsen-Anhalt.
Die Fundstellen 1 Salzmünde,
Saalekreis; 2 Niederröbblingen,
Kr. Mansfeld-Südharz;
3 Profen, Burgenlandkreis;
4 Latdorf, Salzlandkreis,
werden im Text explizit
erwähnt.



hundert Kilometer langen Trassenkorridoren verzeichnete Sachsen-Anhalt in nur zwei Dekaden. Wurde die Denkmalpflege zunächst von dem neuen Wirtschaftsboom überrollt, so lag der Fokus der archäologischen Untersuchungen bald nicht allein auf bereits bekannten Fundstellen bzw. auf als siedlungsgünstig eingestuften Landstrichen. Vielmehr setzte sich eine flächenhafte und systematische Denkmalpflege im Vorfeld von Baumaßnahmen durch. Seither werden große Devastierungen nicht nur als Gegenpol einer auf die Bewahrung spezialisierten Berufssparte angesehen, sondern als Chance für die wissenschaftliche Erfassung der reichen mitteldeutschen Kulturlandschaft begriffen. Anhand von durch Bagger bis auf das archäologisch relevante Niveau abgetiefer 4 m breiter Streifen – diese meist angelegt im Achsabstand von 20 m – wird zunächst die archäologische Evidenz überprüft. Schnell wurde bei diesen Untersuchungen deutlich, dass wir trotz langer und ausgeprägter Forschungstradition nur einen Bruchteil unserer Kulturdenkmale kennen, und selbst bislang aufgrund der topographischen und mikroklimatischen Bedingungen als zur menschlichen Nutzung ungeeignet erscheinende Gelände erbringen nun Nachweise nicht gekannter und vor allem überhaupt nicht vorstellbarer Siedlungsformen.

Ein Siedlungshügel in der Goldenen Aue

Als eindrucksvolles Beispiel sei der Neubau der Nord-Süd verlaufenden BAB 71, welche bei Sangerhausen auf nur wenigen Kilometern nach Sachsen-Anhalt hineinreicht, exemplarisch herausgegriffen. Wir befinden uns hier naturräumlich gesehen in der Goldenen Aue, einem seit jeher – wie der Name besagt – beliebten Siedlungsgrund, wobei in dem durch den Straßenneubau tangierten Bereich keine Fundstellen belegt waren und dort aufgrund hoher Bodenfeuchtigkeit bis heute nur bedingt landwirtschaftliche Nutzung möglich ist. Seit Jahrtausenden mäandrierte im immer feuchten Talboden die Helme, und in flämischer

Zeit wurde zur Entwässerung und zur Energiebindung ein Mühlgraben – die sogenannte Kleine Helme – angelegt. War der Talgrund möglicherweise ehemals trockener gewesen, oder weswegen war hier vor 7000 Jahren von den ersten sesshaften Pionieren eine große Siedlung mit randlich gelegenen Brunnen gegründet worden? Auch eine fast unmerkliche, annähernd einen Hektar große Erhebung am flachen Unterhang wurde seit Anbeginn in das Wohnareal integriert sowie in allen folgenden Zeiten hinweg als Lebensraum, seltener als Bestattungsort genutzt. Und selbst als im letzten vorchristlichen Jahrtausend eine Klimaverschlechterung allenthalben Siedlungsplatzverlagerungen hangaufwärts evozierte, blieb man hier an der fruchtbaren Scholle der Goldenen Aue hängen. Zur Gewährleistung trockenen Baugrundes zog man sich auf die bereits genannte schwache Erhebung im Talgrund zurück. Ob nun während der Jungbronzezeit bis frühen Eisenzeit unbeabsichtigt durch absolute Bauplatzkonstanz im engeren Sinne oder durch bewussten Eintrag von Trockenmaterial jene Siedlungsausformung entstand, die wir im Vorderen Orient mit der Bezeichnung „Tell“ fassen, soll hier nicht Diskussionspunkt sein (Abb. 11.2). Vielmehr gilt es zu betonen, dass es in der mitteldeutschen Region, vergleichbar zur ungarischen Tiefebene etc., höchst ortskonstante Nutzungskonzepte gab, die zu einem künstlich erhöhten Baugrund führten, der sich bis heute trotz jahrhundertelanger Überackerung und Bodenerosion noch mit ungefähr einem Meter im Gelände abzeichnet. Stufen wir eine derartige Siedlungsweise bis zu dieser „Entdeckung“ für Mitteldeutschland als undenkbar ein, so verzeichnen wir nun auf der Grundlage der erworbenen Kenntnisse einen sprunghaften Anstieg vergleichbarer Fundstellen. Allein in der Mikroregion Röblingen zeichnen sich bei exakter Analyse der Geländeoberfläche vier weitere anthropogen erzeugte Wohnhügel ab. Und auch in der Börde lassen sich nun bisher unerklärliche Befunde verstehen – ein Ergebnis, das nur mit der flächenhaften Denkmalpflege zu erzielen ist und bei einer Schwerpunktarchäologie nicht in den Interessensfokus gerückt wäre.

Abb. 11.2: Niederröblingen, Kr. Mansfeld-Südharz. Innerhalb der Goldenen Aue siedelten Menschen immer wieder auf einer kleinen, natürlichen Geländeerhebung. Vor allem in der Bronzezeit (blau) kam es zu einer anthropogenen Aufhügelung, wie wir es von den Tells des Vorderen Orients kennen (überhöhte Darstellung).

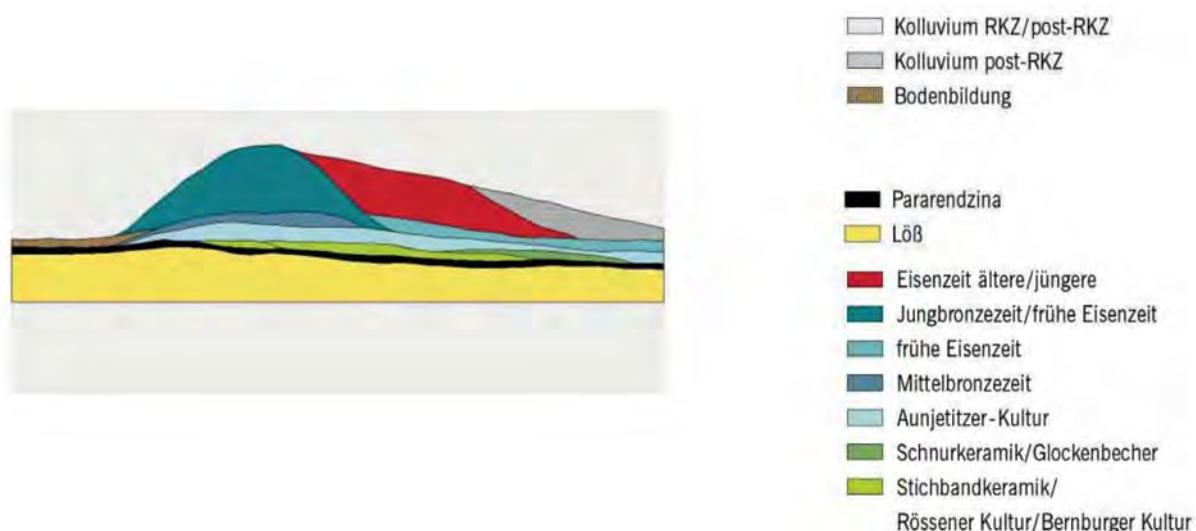




Abb. 11.3: Salzünde-Schiepzig, Saalekreis. Blick von Westen auf den nördlichen Abschnitt des Erdwerks Salzünde (Grabung 2006–2008).

Autobahntrasse liefert Erkenntnisse zur neolithischen Kulturlandschaft

Ebenso wenig hätte man bei einer auf Erfahrungswerten beruhenden Auswahl von Trassenabschnitten bei der zukünftigen Westumfahrung von Halle die heute landwirtschaftlich vollkommen gemiedene Porphyrguppenlandschaft in den archäologischen Vorrangbereich aufgenommen. Nur wenige Millimeter Bodenmaterial bedecken gelegentlich die nicht durchgebrochenen bzw. stecken gebliebenen magmatischen Eruptionsgesteine. Außer spärlichem Trockenrasen und anspruchslosen Dornenhecken gedeiht hier heute nichts, während des Spätneolithikums hingegen blühten Kulturlandschaften. Auf und entlang einzelner Porphyrkuppen legte man während der schnurkeramischen und glockenbecherzeitlichen Kultur die Toten nieder. In nur geringer Entfernung standen die – bislang vergeblich gesuchten – Siedlungen. Dem Anschein nach verfolgte man also eine nachhaltige Wirtschaftsstrategie, indem man seine Häuser – in Pfostenbauweise errichtete Gebäude von ca. 6 m auf 12 m Größe – auf Böden minderer Güte beschränkte und die fruchtbaren Erden für die landwirtschaftliche Nutzung reservierte. Das heißt, für das Ende des dritten vorchristlichen Jahrtausends kann der Umkehrschluss bisheriger Betrachtungsweisen zielführend sein: Unwirtliche Geländelage ist ein positives Auffindungsmerkmal.

Verweilen wir für einen weiteren Aspekt der flächendeckenden Denkmalpflege bei diesem Projekt. Die zukünftige Autobahn A 143 durchschneidet die eponyme Fundstelle Salzünde (Abb. 11.3). Erst die großflächige, auch über den Fundplatz hinausgehende Dokumentation erlaubt es, den kontinuierlichen kulturhistorischen

Wert des über dem Zusammenfluss von Saale und Salza gelegenen Hochplateaus zu erfassen (Abb. 11.4). Während man aus Sicherheitsgründen in der stichbandkeramischen Kultur an dieser Stelle eine umhegte Siedlung anlegte, so kamen nur wenige Jahrhunderte später während der Baalberger Kultur an gleicher Stelle Machtsphären zum Ausdruck. Im reziproken Verhältnis zum nur fünf Kilometer entfernt gelegenen und durch Abschnittswälle charakterisierten Erdwerk „Bischofswiese“ entstanden hier mehrere mächtige Grabhügel. Diese künstlich geschaffenen Geländemarken galt es bei der Erbauung des salzmündezeitlichen Erdwerkes zu integrieren – ein Konzept, das weniger fortifikatorischen Überlegungen als vielmehr einem auf Machtdemonstration fußenden Bauplan gefolgt sein dürfte. Nachdem das vermutlich nur für wenige Jahre bis Jahrzehnte bestehende Erdwerk seine Funktion verloren hatte, errichteten die Träger der Bernburger Kultur fast an Ort und Stelle ein Kollektivgrab. Auf den ersten Blick blieben von diesem nur ein paar Überreste der antiken Beraubung bzw. Ausräumung erhalten; antik bedeutet hier Frühbronzezeit. Als zur Zeit der Aunjetitzer Kultur auf dem Hochplateau eine Siedlung entstehen sollte, befassten sich die Erbauer zunächst mit ihrem Erbe. Die fast vollständig zusedimentierten Gräben des Erdwerkes musste man noch abschließend nivellieren; und was wäre als Verfüllmaterial besser geeignet gewesen, als das ohnehin entweihte, seiner religiösen Bedeutung verlustig gegangene Kollektivgrab? Im Gedenken an die Ahnen kam es zu einer pietätvollen Umbettung der Toten: Schädel, Langknochen und Beigaben wurden in separaten Departements der noch als Geländemulden überlieferten Umfassungsgräben deponiert. Anschließend legte man – quasi als Opfer? – ein Rind nieder.

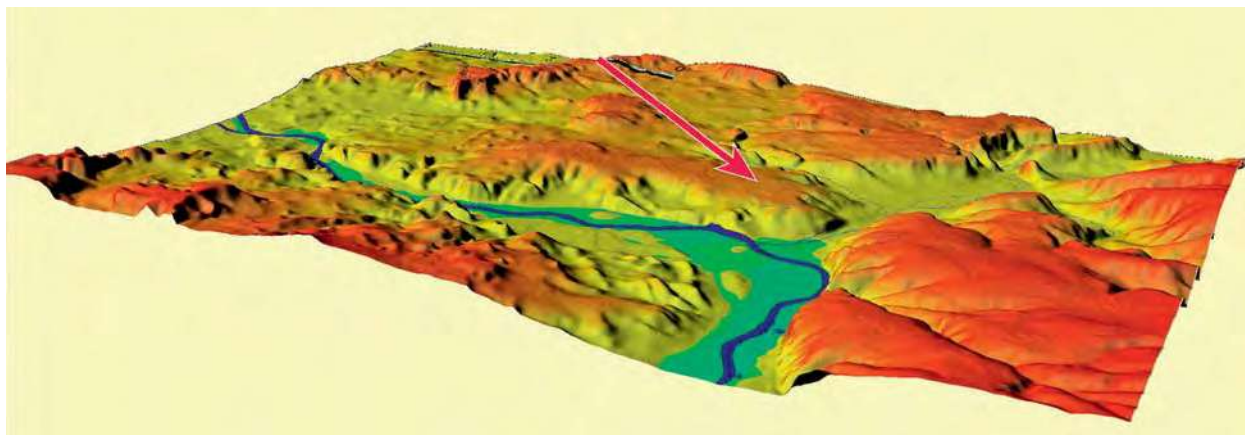


Abb. 11.4: Das Saaletal am Zusammenfluss mit der Salza: Das eponyme Erdwerk Salzmünde liegt am westlichen Rand eines Geländerückens.

Das enge Verhältnis zwischen der Fundstelle Salzmünde und der Bischofswiese von der Baalberger bis zur Bernburger Kultur ließ sich in seinen ersten Ansätzen durch die kontinuierliche Beobachtung aller Areale, auch wenn diese noch so klein und unbedeutsam wirkten, erfassen. Gleichfalls zeigte sich, wie vor 5000 Jahren mit Sichtachsen und anthropogenen Geländeformen bewusst eine kleingliedrige und doch zugleich dominant wirkende Kulturlandschaft erschaffen wurde, von der wir meist nur punktuelle Aspekte fassen und zu interpretieren versuchen. Darüber hinaus zeichnete sich im Ergebnis der flächendeckenden Bodendenkmalpflege die jahrhunderte- bis jahrtausendelange Tradierung historischer Merkmale ab.

Wertvolle Funde aus dem Tagebau

Zum Verständnis des reziproken Verhältnisses der beiden endneolithischen Kulturen trug unter anderem die vollständige Untersuchung im Tagebaufeld Schwer-

zau/Profen bei. Einzelne Bestattungen mit Beigaben sowohl der schnurkeramischen als auch der glockenbecherzeitlichen Kultur kennen wir schon seit Langem, doch gemeinsam genutzte Mikroregionen bzw. Bestattungsareale fehlten bislang. Im Zeitzer Lösshügelland liegen Gräberfelder beider Kulturen in Sichtweite beieinander, so dass wir heute von einem friedlichen Miteinander der beiden Gruppen ausgehen. Typisch für diesen Zeithorizont sind kleine Grabgruppen. Erst die flächenhafte Denkmalpflege erlaubte hier, das Zusammenspiel von Schnurkeramik- und Glockenbecherkultur vollständig zu erfassen.

Gleichfalls darf als Ergebnis der in Sachsen-Anhalt praktizierten Denkmalpflege gelten, dass in dem Tagebaurevier das bislang größte Gräberfeld des Großromstedter Horizontes erkannt und erfasst wurde. Auf insgesamt 12 ha streuten weit über 600 Brandbestattungen. Ohne vorgeschaltete Untersuchung mittels alle 16 m angelegter Baggersondierungsstreifen wären Brandschüttungsgräber in jedem Fall unbemerkt zerstört worden. Gleichwohl dürften gewöhnliche Urnen-



Abb. 11.5: Profen, Burgenlandkreis. In einem Bronzekessel wurden die Reste einer auf dem Scheiterhaufen verbrannten, sehr reichen Germanin und ihre Beigaben deponiert. Neben Bernsteinperlen, Bärenkrallen und vielen weiteren Objekten handelt es sich um fast 400 Gramm Goldschmuck.



Abb. 11.6: Latdorf, Salzlandkreis. Während slawischer Zeit entstanden die beiden Siedlungen: im Norden eingehegt, im Süden offene Niederlassung. Über einen Weg waren sie verbunden – trotzdem wäre dies bei der partiellen oder linearen Untersuchung (grün markiert) nicht erkannt wurden.

gräber beim Abschieben des Oberbodens durch die im Tagebau eingesetzten Großraupen und Absetzbagger übersehen werden. Ob allein der bronzene Kessel, welcher die Überreste der reichsten Frau aus der frühen römischen Kaiserzeit im freien Germanien barg, am klirrenden Geräusch in den Räumungsschaufeln gehört worden wäre? Die beiden darin niedergelegten goldenen Fibeln, zwei aufgebogene Armingreifen, zwei Ringe und zwei Fuchsschwanzketten mit Berlocken, die in feiner Filigran- und Granulationstechnik gefertigt sind, wiegen zusammen knapp 400 Gramm (Abb. 11.5). Eine erhaltene Bärenkralle belegt, dass die Tote während ihrer letzten Reise auf dem Scheiterhaufen nicht nur prächtig gekleidet, von mehreren luxuriösen Silbergefäßen umgeben, sondern vor allem auch statusgemäß auf ein Bärenfell gebettet war. Im Kontext mit den anderen Bestattungen – gewöhnliche Urnen- und Brandschüttungsgräber – gelingt erstmalig für diesen Zeithorizont ein gesamtgesellschaftlicher Überblick über die Bevölkerung des freien Germaniens; Lesefunde oder gar im Luftbild erkennbare Anomalien als Hinweise auf dieses einzigartige große Gräberfeld fehlten.

Slawische Siedlungslandschaft Latdorf

Reiche Funde, seltene Siedlungsbefunde und die Erkenntnis, dass heute unwirtlich wirkende Geländesituationen sehr wohl während prähistorischer Zeit genutzt worden waren, gelten zweifelsfrei als Resultat einer flächendeckenden Denkmalpflege. Doch dürfen wir nicht erst dann eine positive Bilanz unseres kulturhistorischen Auftrags zur Rekonstruktion vorgeschichtlicher Lebensweisen ziehen, wenn wir Räume erkennen – und letztendlich verstehen –, die zu keiner Zeit besiedelt worden waren?

Als besonders gelungenes Beispiel sei die slawische Siedlungslandschaft Latdorf genannt. Bereiche mit Befunden und befundfreie Areale bilden in ihrem Zusammenspiel die vormalige Geschichte ab und lassen darüber hinaus Strukturen erkennen, die im archäologischen Befundplan zwar nicht positiv belegt sind, jedoch zweifelsfrei vorhanden waren. Der dortige Untersuchungsraum von über 60 ha überspannt zwei vorgeschichtliche Siedlungen von 1,4 ha und 2,6 ha Größe (Abb. 11.6). Dazwischen reihen sich wenig oberhalb einer fast unmerklichen Niederung trotz einiger Lücken

quasi perlschnurartig frühmittelalterliche Hausgrundrisse auf. Wäre hier im Vorfeld einer ICE-Neubaustrecke oder einer Autobahn eine archäologische Untersuchung auf der dafür erforderlichen Breite erfolgt, hätten wir trotz der dichten frühmittelalterlichen Besiedlung keine Hinweise auf die damalige Nutzung der Talniederung erhalten. Auf der Grundlage der vorgeschalteten Prospektion und Grabung können wir, wenn auch ohne erhaltene Befunde, den Verbindungsweg zwischen zwei Ortschaften fassen.

Ausblick

Zukünftig wird bei der Erforschung des archäologisch reichen Sachsen-Anhalt die Frage im Vordergrund stehen, warum manche Regionen trotz guter Böden als archäologische Wüsten gelten. Für den Bernburger Raum beispielsweise wissen wir, dass die landwirtschaftliche Tätigkeit der letzten Jahrzehnte fast alle Zeugnisse vormaligen Lebens zerstört hat. Erhalten geblieben sind bis heute lediglich tiefe Bodeneingriffe wie Grabenwerke, Schächte oder Brunnen. Für die Magdeburger Börde fehlt ein vergleichbarer Hinweis, jedoch kennen wir Flächen von mehreren Dutzend Hektar Größe, die trotz bester Bodenqualität und optimaler naturräumlicher Voraussetzungen als siedlungsfrei gelten.

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12 | Lineare Projekte in Baden-Württemberg – Erste Erfahrungen und Ergebnisse

Jörg Bofinger

Zusammenfassung: Die archäologische Begleitung linearer Bauvorhaben wie Pipelines, Schnellbahntrassen oder Autobahnen konnte in den letzten Jahren in Baden-Württemberg erstmals bei einigen Projekten konsequent durchgeführt werden und erbrachte sowohl in denkmalpflegerischer wie auch in wissenschaftlicher Hinsicht erstaunliche Ergebnisse. Zum einen war festzustellen, dass auch bei kommunalen Entscheidungsträgern das Verständnis für Aspekte des Denkmalschutzes geweckt werden konnte und demzufolge Flächen mit bekannt gewordenen Kulturdenkmälern gezielt geschützt wurden. Zum anderen konnten aufgrund von Neuentdeckungen in vielen Bereichen Überlieferungslücken im Fundbild einer Landschaft vervollständigt werden, und es treten nun auch vermehrt solche Fundstellen und Epochen in das Blickfeld, die sonst – aufgrund besonderer Überlieferungsbedingungen wie etwa vereinzelter, disparater Fundniederschlag – kaum Entdeckungschancen besaßen. Am Beispiel der Untersuchungen auf der Trasse der NATO-Pipeline und der Ethylen-Pipeline-Süd (EPS) soll dies im Folgenden illustriert werden.

Einführung

In Baden-Württemberg ist die planmäßige und umfassende archäologische Begleitung und Überwachung von linearen Großprojekten eine relativ junge Entwicklung und wurde erst in den letzten Jahren zu einem eigenständigen Fachbereich beim Landesamt für Denkmalpflege ausgebaut.

Vor allem in Nordbaden und Nordwürttemberg wurden in den vergangenen Jahren einige kleinere und mittelgroße Projekte, wie eine regionale Gasversorgung im Heckengäu (Bofinger & Sikora 2006) oder die NATO-Pipeline im Osten Württembergs (Bollacher et al. 2006; Bollacher & Bofinger 2009) bereits abgeschlossen. Derzeit laufen die Geländearbeiten an der EPS (Ethylen-Pipeline-Süd) zwischen Karlsruhe und der Landesgrenze zu Bayern im Nördlinger Ries (Bofinger & Scholz 2007). In Planung bzw. Vorbereitung befinden sich darüber hinaus zwei ICE-Ausbaustrecken in Südbaden und auf der Schwäbischen Alb sowie zwei weitere Gaspipelineprojekte (Abb. 12.1).

In der Regel lassen sich Verlust und Zerstörung von archäologischen Denkmälern bei linearen Großprojekten nicht vermeiden. Somit ist die denkmalpflegerische Begleitung und archäologische Überwachung von linearen Großprojekten unerlässlich und birgt sowohl in denkmalpflegerischer als auch in wissenschaftlicher Hinsicht ein enormes Potential. Durch den Aufschluss einer Leitungs- oder Straßentrasse über viele Kilometer hinweg bietet sich die Gelegenheit, ungefilterte Aufschlüsse und Einblicke in eine Siedlungslandschaft zu erhalten. Hinzu kommt, dass sich in den allermeisten Fällen die tiefgehenden Erdingriffe keinesfalls auf den nur schmalen Rohrgraben und den zugehörigen, mehr

oder minder breiten Arbeitsstreifen beschränken, sondern in der Regel auch in ausgedehnten Baulogistikflächen sowie an Rohrlagerplätzen, Dükerstellen, Baustraßen etc. flächiger Bodenabtrag vorgenommen wird und damit eine Gefährdung der archäologischen Substanz im Boden geben ist (Bofinger & Bollacher 2009). Grundlage der Planung der Feldarbeiten ist dabei für jedes Projekt eine GIS-gestützte Fundstellenaufnahme, bei der zunächst einmal alle bekannten Fundstel-

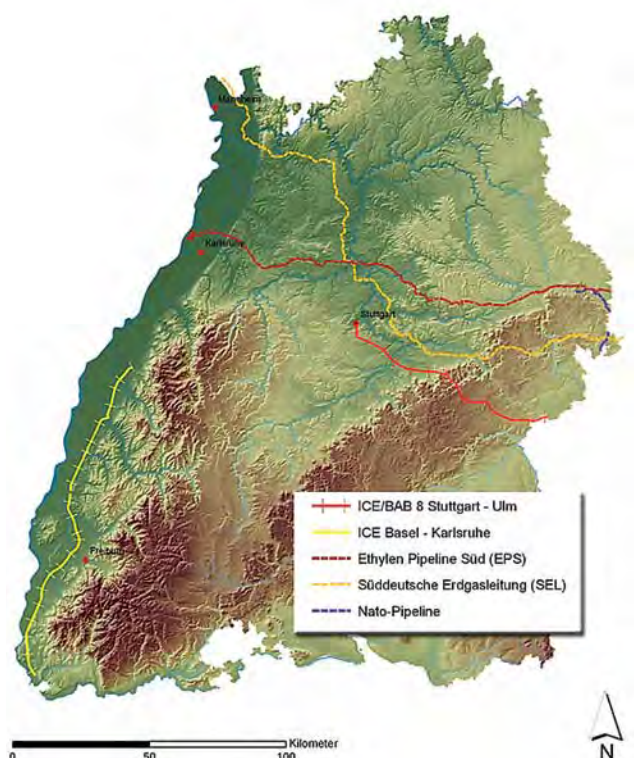
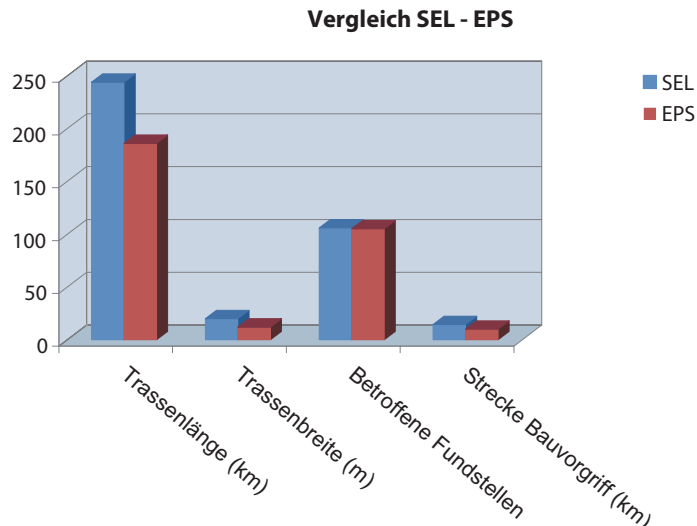


Abb. 12.1: Lineare Projekte in Baden-Württemberg, die seit 2006 archäologisch begleitet und überwacht wurden bzw. derzeit in Planung sind.



SEL - EPS Vergleich der Trassen

	SEL	EPS
Trassenlänge (km)	244	186
Trassenbreite (m)	20	12
Betroffene Fundstellen	106	105
Strecke Bauvorgriff (km)	14,5	10

Abb. 12.2: Vergleich der Dimensionen und Anzahl der betroffenen Fundstellen der beiden großen Pipelineprojekte EPS und SEL in Baden-Württemberg.

len, wie sie in den Fundakten bzw. in der Fundstellendatenbank der staatlichen Denkmalpflege verzeichnet sind, in einer Pufferzone auf beiden Seiten der geplanten Trassierung aufgenommen werden. Dabei kommt vor allem den Resultaten der Luftbildarchäologie ein besonderer Stellenwert zu: Dank der wertvollen Datenbasis, die im Luftbildarchiv des Landesamts für Denkmalpflege vorgehalten wird, nehmen die Luftbildfundstellen einen beträchtlichen Anteil der im Vorfeld bekannten Fundstellen innerhalb eines Erfassungstreifens ein. Weiterhin können die Ergebnisse von gezielten Begehungen, etwa durch ehrenamtliche Mitarbeiter der Archäologischen Denkmalpflege, und weitere gezielte Prospektionsmaßnahmen (z. B. Geophysik) dazu beitragen, die Zahl der bekannten Fundstellen beträchtlich zu vergrößern, von deren Existenz aufgrund systematischer Erhebungen bei zahlreichen Trassenprojekten mit Sicherheit auszugehen ist, deren konkrete Lage im Boden und archäologische Relevanz zum Zeitpunkt der Planungen nur noch unbekannt sind.

Da hier aufgrund der häufig unzureichenden Quellenlage die tatsächliche Ausdehnung bekannter Fundstellen im Vorfeld kaum mit Sicherheit zu bestimmen ist, kommt den gezielten, bauvorgreifenden Prospektionsmaßnahmen häufig eine besondere Bedeutung zu. Diese können dazu beitragen, die Ausdehnung bekannter archäologischer Kulturdenkmale parzellenscharf einzugrenzen.

Die Fundstellenaufnahme für die beiden Trassen der Eythlen-Pipeline-Süd (EPS) und der geplanten Süd-deutschen Erdgasleitung (SEL), die auf einer Strecke von über 185 km bzw. 240 km das Territorium von Baden-Württemberg queren, macht deutlich, in welchem Maße archäologische Fundstellen betroffen sind (Abb. 12.2).

In der Praxis hat es sich für die Planungen und Verhandlungen mit den Vorhabensträgern bewährt, schon im Vorfeld der Maßnahme solche Trassenabschnitte zu definieren, in denen die Anzahl, Art und Qualität der bekannten Fundstellen aufwendige und damit länger andauernde Feldarbeiten erwarten lassen. Dort müssen die Ausgrabungen mit entsprechendem zeitlichem Vorlauf bereits im Vorfeld der Baumaßnahmen ohne baubedingten Zeitdruck durchgeführt werden. Die übrigen Trassenabschnitte werden vollständig baubegleitend untersucht (Abb. 12.3).

Denkmalpflegerische und wissenschaftliche Herausforderung und Chance

Bereits die ersten Ergebnisse an der NATO-Pipeline und an der EPS-Pipeline haben gezeigt, dass im Arbeitsstreifen der jeweiligen Baumaßnahme mit einer Vielzahl von Neuentdeckungen zu rechnen ist, die den Denkmalbestand erheblich vergrößern. Diese Beobachtung deckt sich mit den Erfahrungen aus anderen, ähnlich gelagerten Bauprojekten in der Bundesrepublik, wo im Trassenbereich ein Fundstellenzuwachs verzeichnet wurde, der die Zahl der schon vor Baubeginn bekannten Bodendenkmäler regelhaft um das fünf- bis zehnfache übersteigt (Dresely & Stäuble 2004, 6 ff.). Dieser repräsentative Querschnitt durch eine prähistorische Siedlungslandschaft lässt weitergehende Rückschlüsse über das archäologische Potential einer Gegend zu. Diese Ergebnisse wiederum bieten für Planung und Durchführung zukünftiger Grabungsprojekte und Strategien zur Unterschutzstellung eine bessere Beurteilungsgrundlage.

Bei der Begleitung solcher Großprojekte ist die Archäologische Denkmalpflege nicht allein mit den lo-

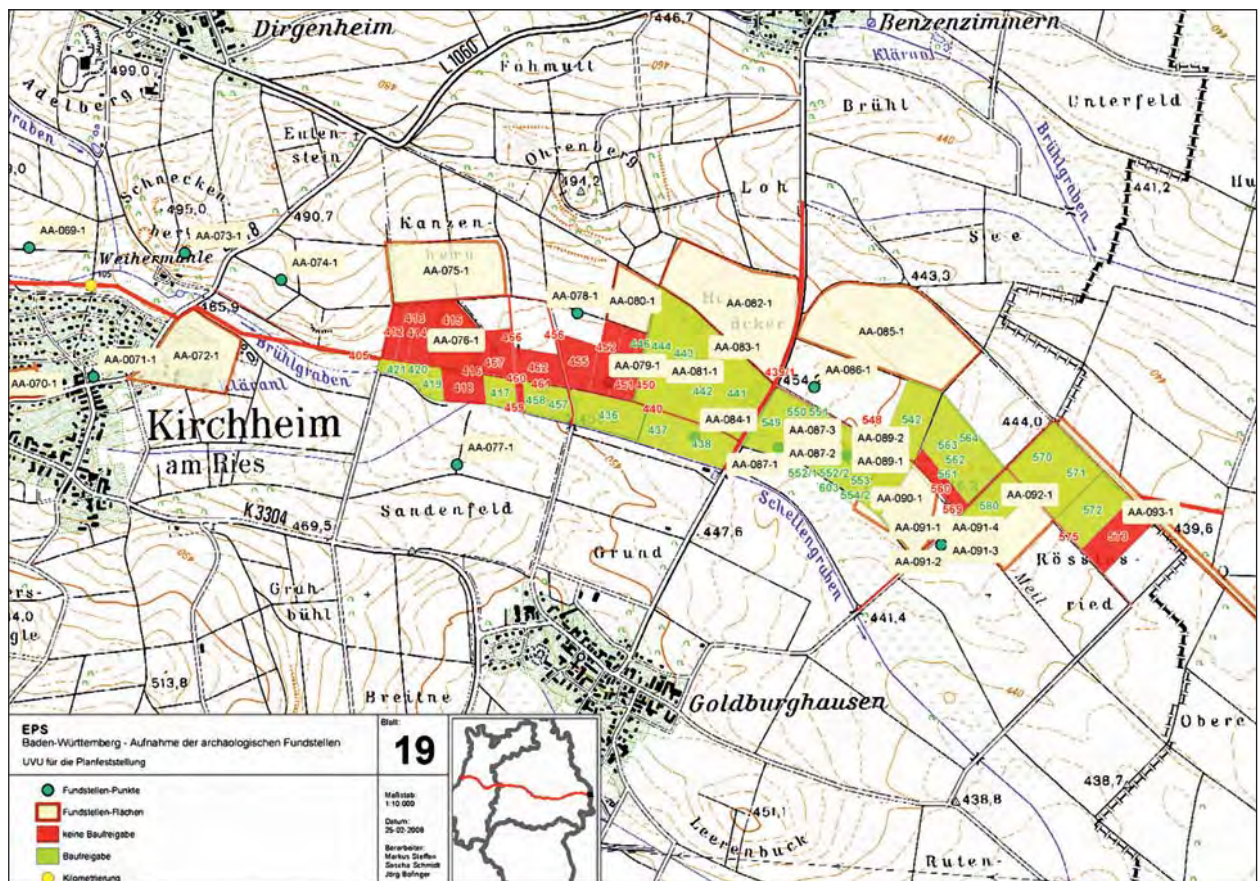


Abb. 12.3: Ausschnitt aus der Fundstellenkarte im Bereich der Trasse der EPS im Ostalbkreis. Der dicht mit bekannten Fundstellen bedeckte, ca. 2,5 km lange Abschnitt zwischen Kirchheim/Ries und der Landesgrenze zu Bayern wurde bauvorgreifend untersucht. Für die übrigen Streckenabschnitte ist eine baubegleitende archäologische Beobachtung vorgesehen.

gistischen Herausforderungen bei der archäologischen Feldarbeit konfrontiert, darf doch einerseits der Bauablauf nicht behindert werden und sind andererseits Abstriche an der Qualität der archäologischen Ausgrabung und Dokumentation zu vermeiden. Auch die methodische Herangehensweise erfordert neue Wege und Strategien zur erfolgreichen Durchführung und Auswertung solcher Maßnahmen.

Kilometerlange Aufschlüsse durch unterschiedlichste naturräumliche Einheiten und Siedlungskammern geben gänzlich andere Einblicke in die unterirdischen Archive, als dies Rettungsgrabungen, die auf mehr oder weniger begrenzte Flächen beschränkt sind, vermögen. Auch wenn häufig durch die restriktive Begrenzung der archäologischen Dokumentations- und Bergungsmaßnahmen auf den eigentlichen Trassenausschnitt Fundstellen nicht vollständig dokumentiert werden können und Siedlungspläne und Gräberfeldausschnitte Stückwerk bleiben müssen, ist dennoch eine neue Beurteilungsgrundlage für Quellenlage, Erhaltungsbedingungen, Siedlungsmuster und -lagen sowie für diachrone Untersuchungen zu Besiedlungsgang und prähistorischer Landschaftsnutzung gewährleistet.

Dies gilt in erster Linie für Betrachtungen auf regionaler Ebene, verändert doch die deutlich vergrößerte Zahl an Fundstellen infolge der Neuentdeckungen nach Abschluss eines Projektes die Quellenbasis augenfällig: Auf der Trasse der NATO-Pipeline waren in Baden-Württemberg beispielsweise vor Baubeginn im Jahr 2006 lediglich drei Fundstellen bekannt. Diese

Zahl konnte dank der Überwachung der 29 km langen Trasse im Ostalbkreis und im Kreis Heidenheim auf 17 Fundpunkte erhöht werden, an denen insgesamt rund 30 Fundstellen unterschiedlicher Art und Zeitstellung aus nahezu allen vor- und frühgeschichtlichen Epochen nachgewiesen werden konnten (Bollacher et al. 2006; Bofinger & Bollacher 2009).

Aber auch auf lokaler Ebene führen die Einblicke in die aufgeschlossenen Fundstellen häufig zu neuen Erkenntnissen: So gelingt nicht selten der Nachweis bislang unbekannter Nutzungs- und Belegungsphasen eines Fundplatzes. Auch dringender Handlungsbedarf der Denkmalpflege wird besonders dann eindrücklich vor Augen geführt, wenn etwa aufgedeckte Gräber nur noch letzte, vom Pflug verschonte oder bereits verlagerte Reste der Bestattungen und deren Beigaben zeigen oder Siedlungsbefunde, die noch vor einigen Jahren im Luftbild auszumachen waren, im abgeschobenen Trassenareal nicht mehr nachzuweisen sind.

Vor allem der Vergleich und die Kombination der Ergebnisse mehrerer Trassenprojekte lassen weiter reichende Interpretationen, auch im überregionalen Zusammenhang, über das prähistorische Siedlungsverhalten und unterschiedliche Landnutzungsbilder in den jeweiligen Kulturlandschaften zu.

Mit der NATO-Pipeline liegt aus Baden-Württemberg nunmehr ein Projekt vor, bei dem die Feldarbeiten abgeschlossen sind und erste Ergebnisse hier vorgelegt werden, um die oben genannten Aspekte auch am konkreten Fall zu beleuchten.

Auch erste Untersuchungen auf Trassenabschnitten der EPS sollen im Folgenden kurz vorgestellt werden, da hier bislang größere Abschnitte bauvorgehend untersucht werden konnten. Vor allem am Beispiel eines ca. 2,5 km langen Abschnitts nahe der Landesgrenze zu Bayern lässt sich eindrucksvoll der Fundstellenreichtum einer Altsiedellandschaft zeigen, eine Beobachtung, die zwar im Vorfeld der Maßnahmen als gegeben angenommen werden konnte, nun aber auf eine gesicherte Basis gestellt werden kann und mit konkreten Zahlen, Datierungen und Befunden zu untermauern ist.

Die NATO-Pipeline in Baden-Württemberg

Im Jahr 2006 wurde eine Lücke im Fernverbindungsnetz der Treibstoffversorgung für die Fliegerhorste der Bundesluftwaffe durch den Bau eines noch fehlenden, ca. 80 km langen Teilstücks der sogenannten NATO-Pipeline in Baden-Württemberg und Bayern geschlossen. Davon entfielen ca. 29 km auf das Land Baden-Württemberg, die während neun Monaten archäologisch begleitet wurden (Abb. 12.4). Die Leitungstrasse führte durch Landschaften wie das westliche Ries, das Albvorland und die östliche Schwäbische



Abb. 12.4: Der Verlauf der Nato-Pipeline in den Kreisen Heidenheim und Ostalbkreis mit Eintrag der Fundpunkte, an denen oftmals Fundstellen unterschiedlicher Zeitstellung zutage traten.

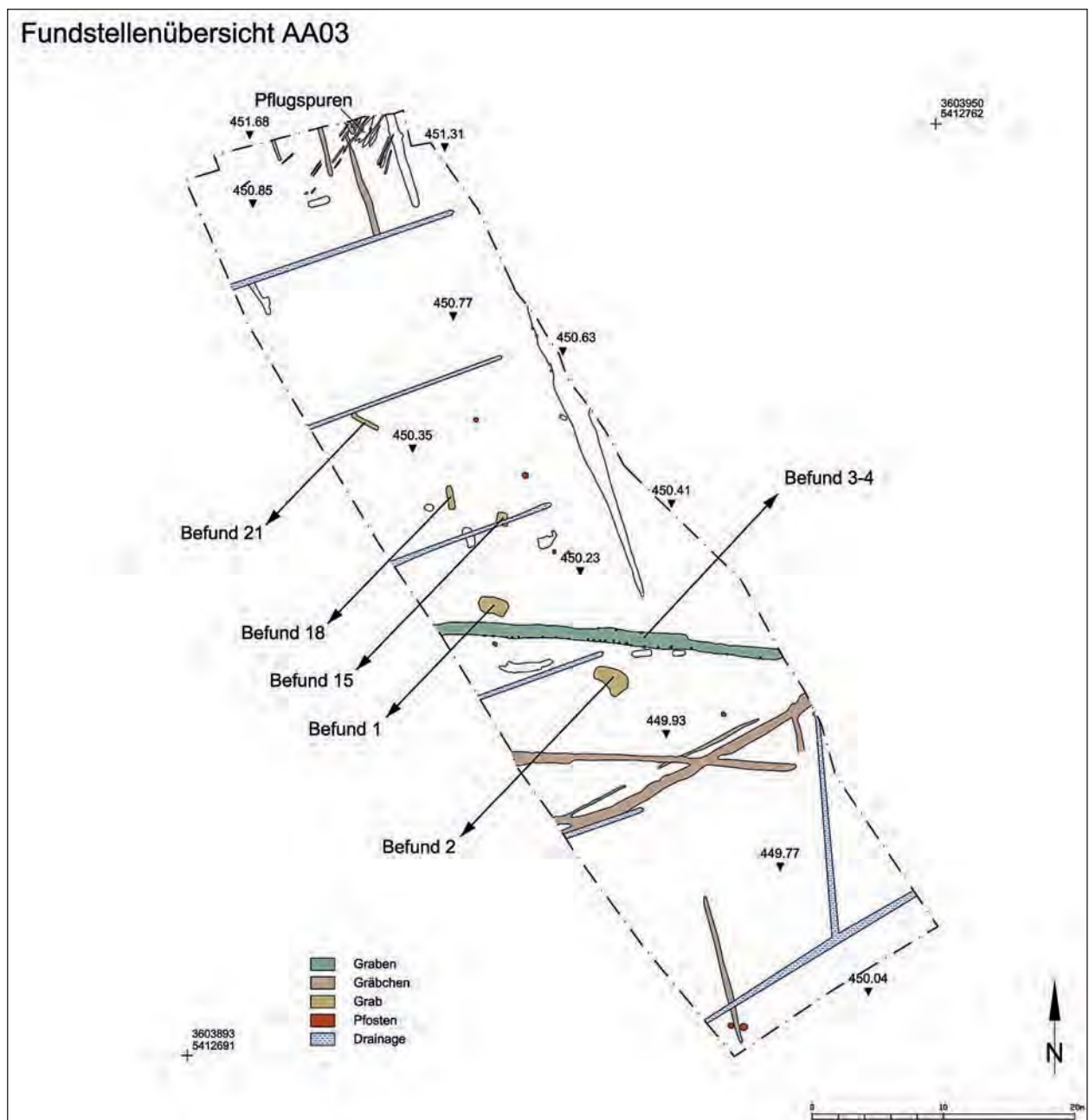
Alb, deren Fundstellenreichtum eine archäologische Begleitung eines solchen Projektes unabdingbar machte und das Handeln der staatlichen Denkmalpflege erforderte.

Zwar waren vor Beginn der Baumaßnahmen im unmittelbaren Trassenbereich lediglich drei Fundstellen mit Sicherheit zu lokalisieren, doch ließen die Nähe und die Nachbarschaft von prominenten archäologischen Denkmälern wie etwa der prähistorischen Befestigungsanlage auf dem Ipf bei Bopfingen oder dem Goldberg im Nördlinger Ries weitere Entdeckungen in dem 10–11 m breiten Arbeitsstreifen der Pipeline, in dem der Humus entfernt wurde, erwarten.

Die Fundstellen auf der NATO-Pipeline spannen mit unterschiedlichsten Befunden einen zeitlichen Bogen von der Linearbandkeramik bis ins Frühmittelalter. Hierbei sind vor allem solche Fundstellen zu erwähnen,

deren Befundgattungen sonst eher selten im Fundbild archäologischer Ausgrabungen Südwestdeutschlands auftauchen. Hierzu gehören beispielsweise zwei Körperbestattungen aus dem Mittelneolithikum, die auf den nördlichen Egerterrassen bei Trochtelfingen aufgedeckt wurden (Abb. 12.5; Fundstelle AA-03, Gemarkung Trochtelfingen, Gewann „Pflaumlocher Weg“; Bofinger & Bollacher 2009). Zwischen wohl latènezeitlichen Gräbchensystemen, die einen großen Bereich der aufgebaggerten Trasse durchzogen, lagen zwei Gräber, die aufgrund von Bestattungssitte und Beigaben der mittelneolithischen Großgartacher Gruppe zugewiesen werden können. Da aufgrund der umgebenden Fundsituation weitgehend ausgeschlossen werden kann, dass es sich bei den beiden Gräbern um Siedlungsbestattungen gehandelt hat, scheint hier eine kleine mittelneolithische Nekropole erfasst worden zu

Abb. 12.5: Bopfingen-Trochtelfingen, Gesamtplan der Fundstelle NATO-AA-03 mit den mittelneolithischen und spätbronzezeitlichen Grabfunden.



sein, deren Nachweise in Baden-Württemberg bislang noch relativ selten sind.

An derselben Fundstelle konnte mit drei spätbronzezeitlichen Brandgräbern darüber hinaus eine ebenfalls sonst eher seltene Befundgattung erfasst werden. Die Gräber waren mit aufwendigen Packungen aus schweren Kalksteinen überdeckt, darunter fanden sich in den Grabgruben neben den mit Leichenbrand gefüllten Urnen zahlreiche weitere Gefäße, unter anderem reich verzierte Becher und Trichterrandgefäße. Unter den Beigaben sind ferner ein schmaler Bron-

zedolch sowie eine gut erhaltene Bronzenadel zu erwähnen (Abb. 12.6).

Diesen beiden Beispielen für Nachweise seltener Befundgattungen sei schließlich noch ein interessanter Siedlungsbefund an die Seite gestellt, der, obgleich von der Trasse nur angeschnitten, dennoch ein Schlaglicht auf außergewöhnliche Siedlungsbefunde der jüngeren Latènezeit zu werfen vermag. Unter den Fundstellen auf der Trasse der NATO-Pipeline ist die jüngere Latènezeit mit vier Fundstellen vertreten. Interessanterweise handelt es sich dabei um Spuren unbefes-

Abb. 12.6: Beigaben aus den spätbronzezeitlichen Gräbern von Bopfingen-Trochtelfingen. Länge der Nadel etwa 19,5 cm.

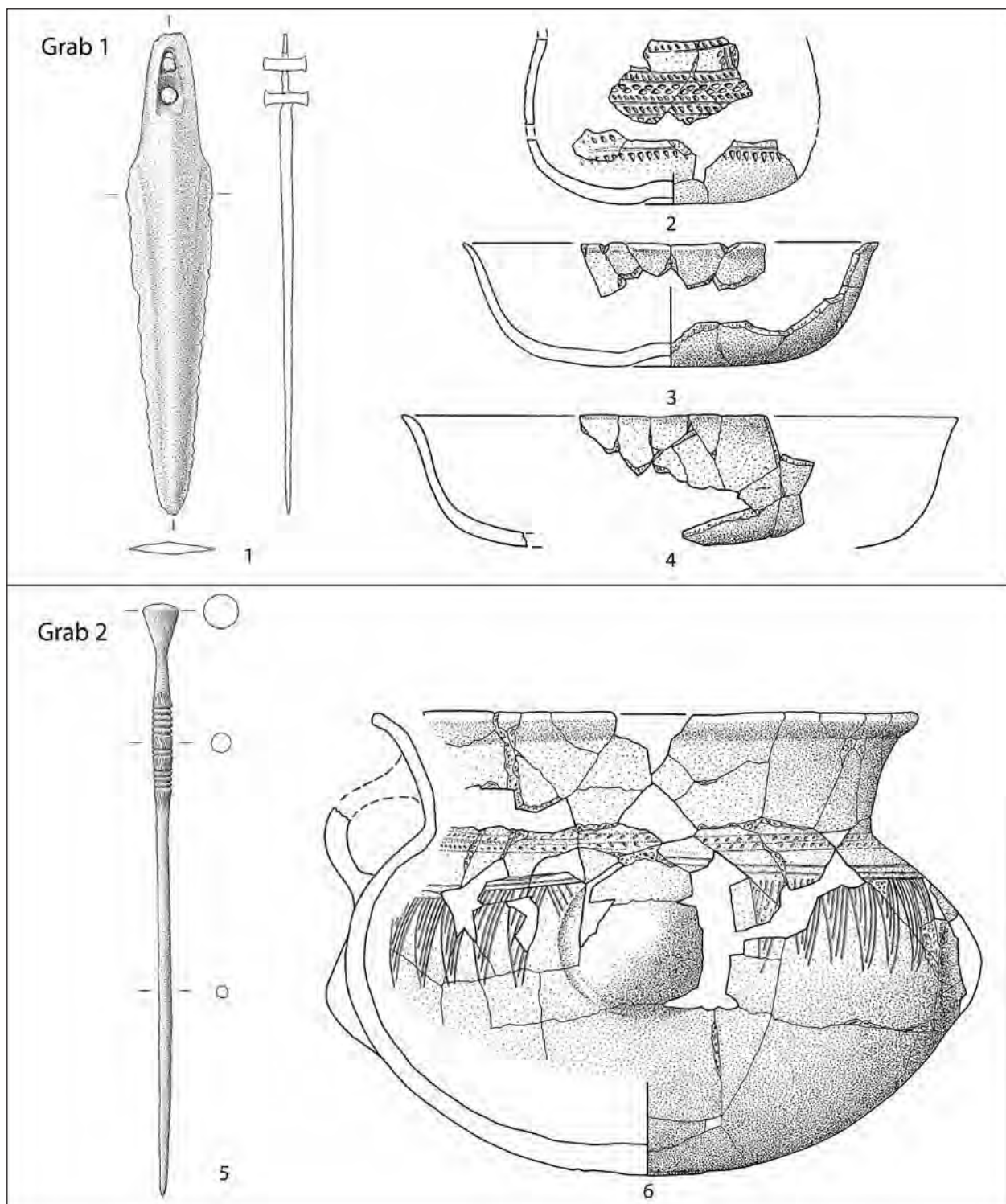


Abb. 12.7: Utzmemmingen, Fundstelle NATO-AA-13. Grabungssituation an der Fundstelle AA-13 des latènezeitlichen Grundrisses in der Flur „Langes Feld“ nahe den Ofnethöhlen, Ostalbkreis.



tigter bzw. schwach umhegter Siedlungen eines wohl weilerartigen Zuschnitts. An der Fundstelle AA-13, Trassenkilometer 19,4, konnte der Grundriss eines mächtigen Pfostenbaus mit umlaufendem Wandgräbchen in Ausschnitten erfasst werden (Abb. 12.7). Der Befund zeigt, dass derartige Großbauten einst auch außerhalb der Viereckschanzen anzutreffen waren (Abb. 12.8). Im speziellen Fall der latènezeitlichen Fundstellen wirft die archäologische Begleitung linearer Bauprojekte ein neues Licht auf die überlieferungsbedingte, scheinbare Dominanz der Viereckschanzen im Siedlungsbefund der jüngeren Latènezeit. In zunehmendem Maß geraten auch kleinere, offene Siedlungsstellen in den Fokus der Forschung und tragen dazu bei, die Fundkarte zugunsten eines differenzierteren und realistischeren Bildes zu korrigieren.

Gleichzeitig können die langen Aufschlüsse einer Pipelinetrasse dazu dienen, offene Fragestellungen und Hypothesen zu wichtigen, bereits bekannten Fundstellen – im Falle der NATO-Pipeline die Frage nach einer möglichen Außensiedlung zur befestigten hallstattzeitlichen Höhenburg auf dem Ipf – zu beurteilen bzw. zu überprüfen. So waren im Trassenverlauf unmittelbar unterhalb des Ipf keinerlei Siedlungsbefunde zu erkennen, die auf eine zusammenhängende Außensiedlung, vergleichbar mit derjenigen an der Heuneburg an der oberen Donau, hindeuteten. Vielmehr darf davon ausgegangen werden, dass der Außenbereich locker mit Rechteckhöfen aufgesiedelt war, wie sie im Umfeld des Ipf in den letzten Jahren bei archäologischen Ausgrabungen untersucht werden konnten (Krause et al. 2008, 277). Auch die an der Nordseite des Ipf verlaufende Trasse der EPS-Pipeline (s. unten) erbrachte keine weiteren Indizien für eisenzeitliche Siedlungsaktivitäten in diesem Bereich.

Selbst der Fundkarte der römischen Epoche im Umfeld des Nördlinger Rieses, wo die Quellenlage für diese Zeit aufgrund intensiver Befliegungsaktivitäten der Luftbildarchäologie sowie günstiger Auffindungsbedingungen und Nachweismöglichkeiten als relativ gut

bezeichnet werden darf, konnten neue Fundstellen hinzugefügt werden.

Nachdem mit der Trasse der NATO-Pipeline das Areal des bereits bekannten römischen Gutshofs beim Weiler Osterholz im Gewann „Kratzbuck/Krummes Gewand“ (Fundstelle AA-01) angeschnitten worden war und die Umfassungsmauer der *villa rustica* über eine Strecke von ca. 20 m freigelegt werden konnte, gelang im Gewann „Wallersteiner Weg“ bei Trochtelfingen (Fundstelle AA-08) der Nachweis einer bislang unbekannten römischen Hofanlage. Auch im relativ schmalen Arbeitsstreifen der Pipeline, in dem vor allem die Umfassungsmauer mit einer Toranlage angeschnitten wurde, war zu erkennen, dass die Baugeschichte des Gutshofs mindestens zwei Phasen umfasste: Einer ersten Holzbauphase folgte offenbar ein Ausbau in Stein. Mit dem Nachweis der neuen römischen Villa konnte eine Lücke geschlossen werden, die noch in der Reihe der ländlichen Ansiedlungen parallel zur römischen Egertalstraße klaffte, wozu auch die Gehöfte in den Gewannen „Hauser Feldle“ (Gemarkung Kerkingen), „Büchs“, „Kalkofen“ (Gemarkung Kirchheim am Ries) und „Bersich“ (Gemarkung Trochtelfingen) zu rechnen sind.

Mit der Fundstelle in der Flur „Memminger Weg“ bei Bopfingen-Trochtelfingen (Fundstelle AA-002) kann den bislang nicht allzu zahlreichen bekannten früh-alamannischen Bestattungsplätzen im süddeutschen Raum ein weiterer Punkt hinzugefügt werden, der aufgrund der Befundsituation ohne die archäologische Begleitung der Trasse sicherlich unentdeckt geblieben wäre.

Dort kamen, etwas abseits von zwei Vierpfostenbauten gelegen, zwei Körpergräber aus früh-alamannischer Zeit zum Vorschein, die für den Raum zwischen Ellwangen und Nördlinger Ries ebenfalls eine ausgesprochene Seltenheit darstellen (Bofinger & Bollacher 2009). Vor allem Grab 2 ist aufgrund der Beigabe eines „Bernsteincolliers“ von besonderer Bedeutung: Um den Kopfbereich herum fand sich eine Vielzahl von po-

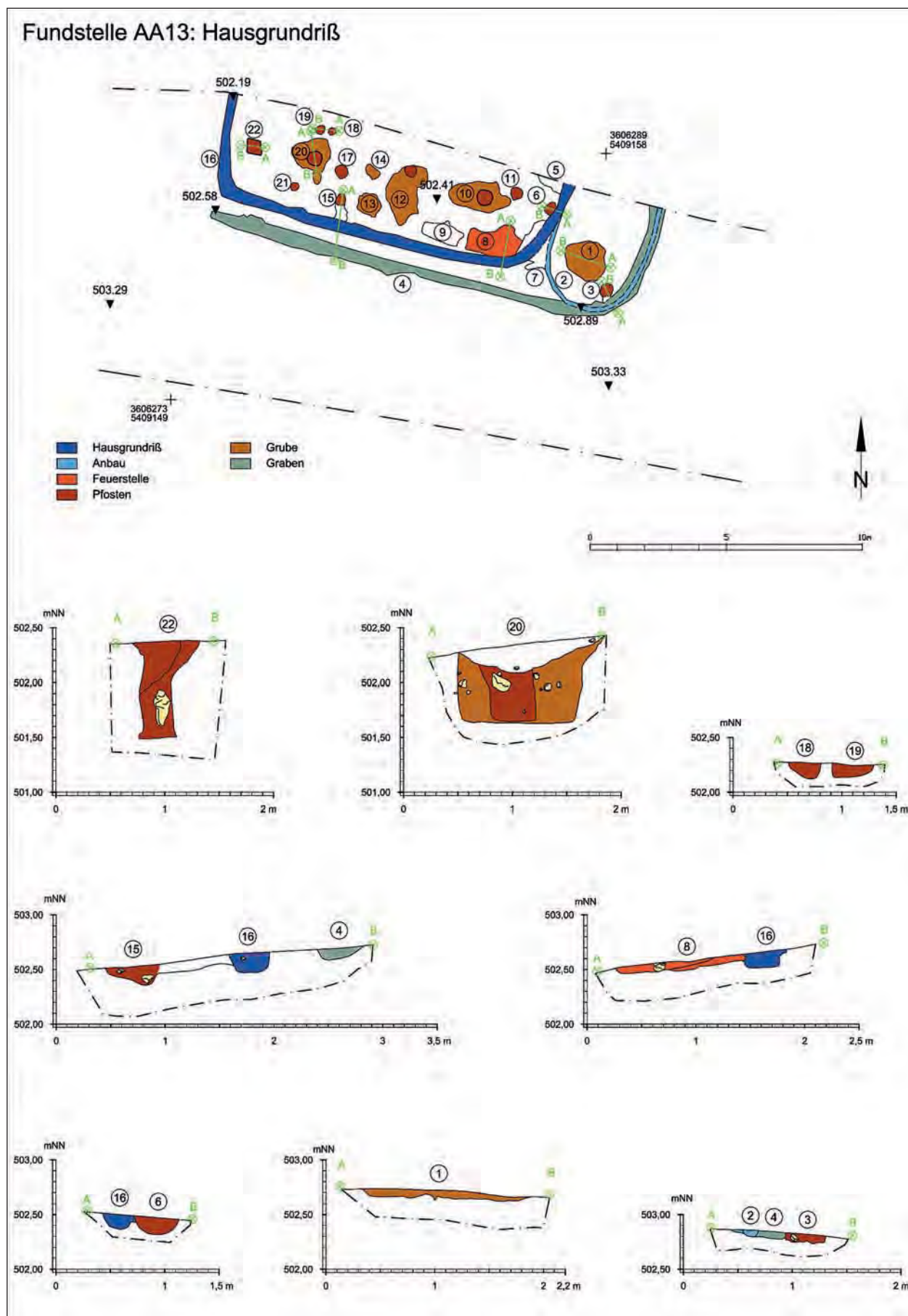


Abb. 12.8: Uzmemmingen, Fundstelle NATO-AA-13. Plan der Fundstelle des latènezeitlichen Grundrisses in der Flur „Langes Feld“.

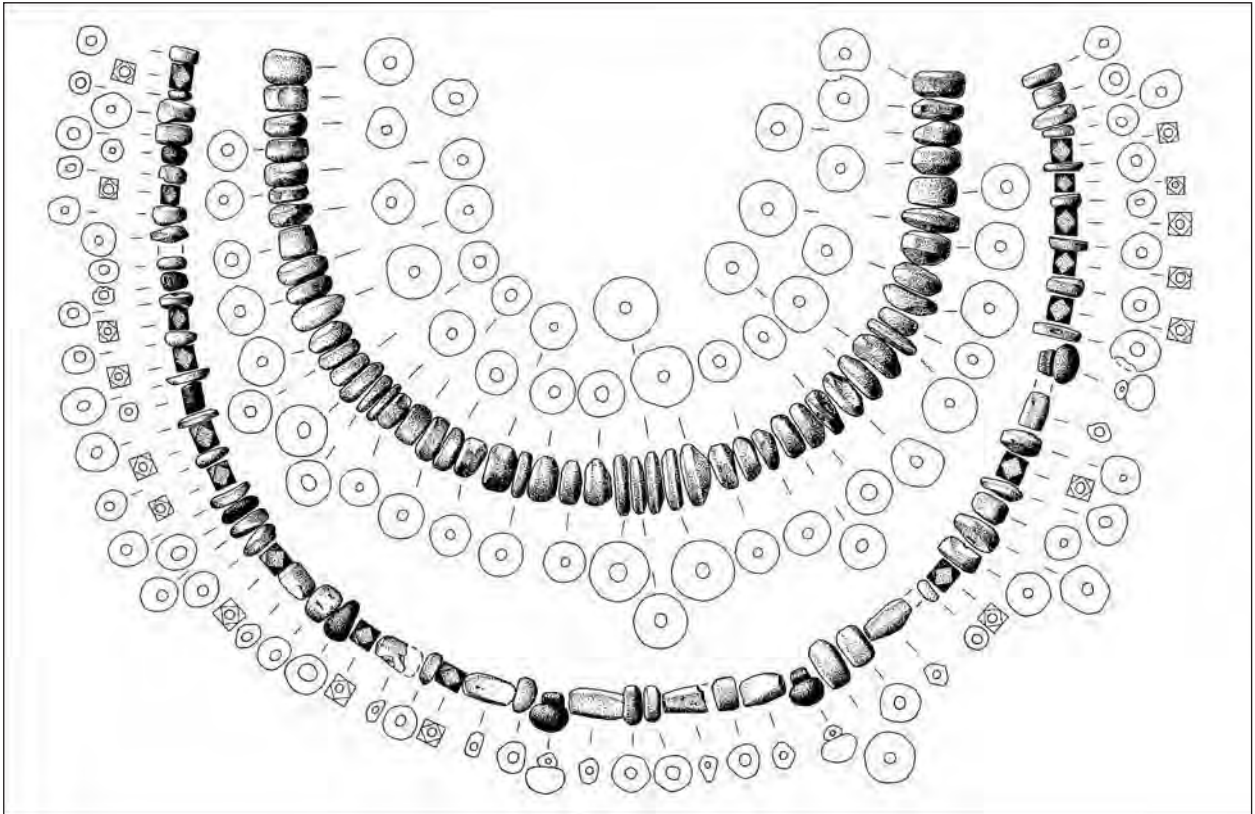


Abb. 12.9: Bopfingen-Trochelfingen, Fundstelle NATO-AA-02. Frühalamannisches Perlen- und Bernsteincollier aus Grab 2. M. 1:2.

lyedrischen, transluziden kobaltblauen und ringchenförmigen, gelbopaken Glasperlen sowie runden bis scheibenförmigen Bernsteinperlen, die sich nach der aufwendigen Restaurierung als Bestandteile eines feingliedrigen Colliers zusammenfügen ließen (Abb. 12.9). Die Kombination von polyedrischen, transluziden kobaltblauen Perlen des äußeren Kettenstrangs mit den transluzid-blauen Ösenperlen ist ein typisches Element frühalamannischer Ketten und erlaubt eine Datierung der Grabfunde in das 4. bzw. 5. Jahrhundert n. Chr. Solche eher unscheinbaren Befundgattungen wie die frühalamannischen Bestattungsplätze besitzen aufgrund der geringen flächenmäßigen Ausdehnung bzw. der locker gestreuten und spärlichen Befunddichte nur sehr ungünstige Auffindungschancen. So treten sie entweder nur als Einzelgräber oder als kleine Bestattungsplätze mit wenigen Toten und bis zu 10 m auseinander liegenden Gräbern in Erscheinung (Schach-Döriges 1987, 86). Eine konsequente und flächendeckende Beobachtung der Trassen kann deshalb auch in besonderem Maße dazu beitragen, solche „fragilen“ Befundgruppen zu entdecken und für die Regionalgeschichte wichtige Quellen als Mosaiksteinchen in den Fundkarten zu erschließen.

Untersuchungen auf der Trasse der Ethylen-Pipeline-Süd (EPS) bei Karlsruhe und im Nördlinger Ries

Mit dem Bau der Ethylen-Pipeline Süd (EPS) wird seit 2007 ein groß angelegtes Pipelinebauprojekt durch die Archäologische Denkmalpflege in Baden-Württemberg begleitet, das im nördlichen Landesteil auf einer Länge von rund 190 km in west-östlicher Richtung durch Nordbaden und Nordwürttemberg verläuft.

Mit dieser Pipeline sollen Standorte der chemischen Industrie in Süddeutschland miteinander verbunden werden. Um das gasförmige Produkt zur Herstellung von Kunststoff von Münchsmünster (Lkr. Paffenhofen a. d. Ilm) bzw. aus dem bereits bestehenden Pipelineabschnitt von Burghausen in Bayern nach Ludwigshafen in Rheinland-Pfalz transportieren zu können, wurde der Bau einer insgesamt über 360 km langen Pipeline geplant. Auch in den Bundesländern Bayern (Strobl & Gläser 2008) und Rheinland-Pfalz wurde bzw. wird die gesamte Strecke archäologisch überwacht. Die Streckenführung auf baden-württembergischem Terrain führt in West-Ost-Richtung durch die Regierungsbezirke Karlsruhe und Stuttgart: Nach der Querung der Rheins beginnt die Trasse in Baden-Württemberg im Stadtkreis Karlsruhe, läuft durch die Landkreise Karlsruhe, Enzkreis, Ludwigsburg und den Rems-Murr-Kreis und verlässt das Landesgebiet an der Grenze des Ostalbkreises zu Bayern im Nördlinger Ries.

Bereits im Vorfeld der Baumaßnahmen wurde für den baden-württembergischen Streckenabschnitt zwischen dem Vorhabensträger und dem Landesamt für Denkmalpflege eine Vereinbarung abgeschlossen, die die archäologische Betreuung und die Kostenübernahme für die Rettungsgrabungen regelt. Eine umfassende Aufnahme aller bekannten Fundstellen auf der geplanten Trasse machte schnell deutlich, dass zahlreiche archäologische Fundstellen durch die Baumaßnahmen unmittelbar betroffen sind und unwiederbringlich zerstört werden würden, weshalb sich eine Ausgrabung im Vorfeld der Bautätigkeiten als unabdingbar abzeichnete. Entsprechend dem Vorgehen bei der NATO-Pipeline wurden auch im Bereich der Trasse der EPS bestimmte Abschnitte (insgesamt knapp 10 km) mit

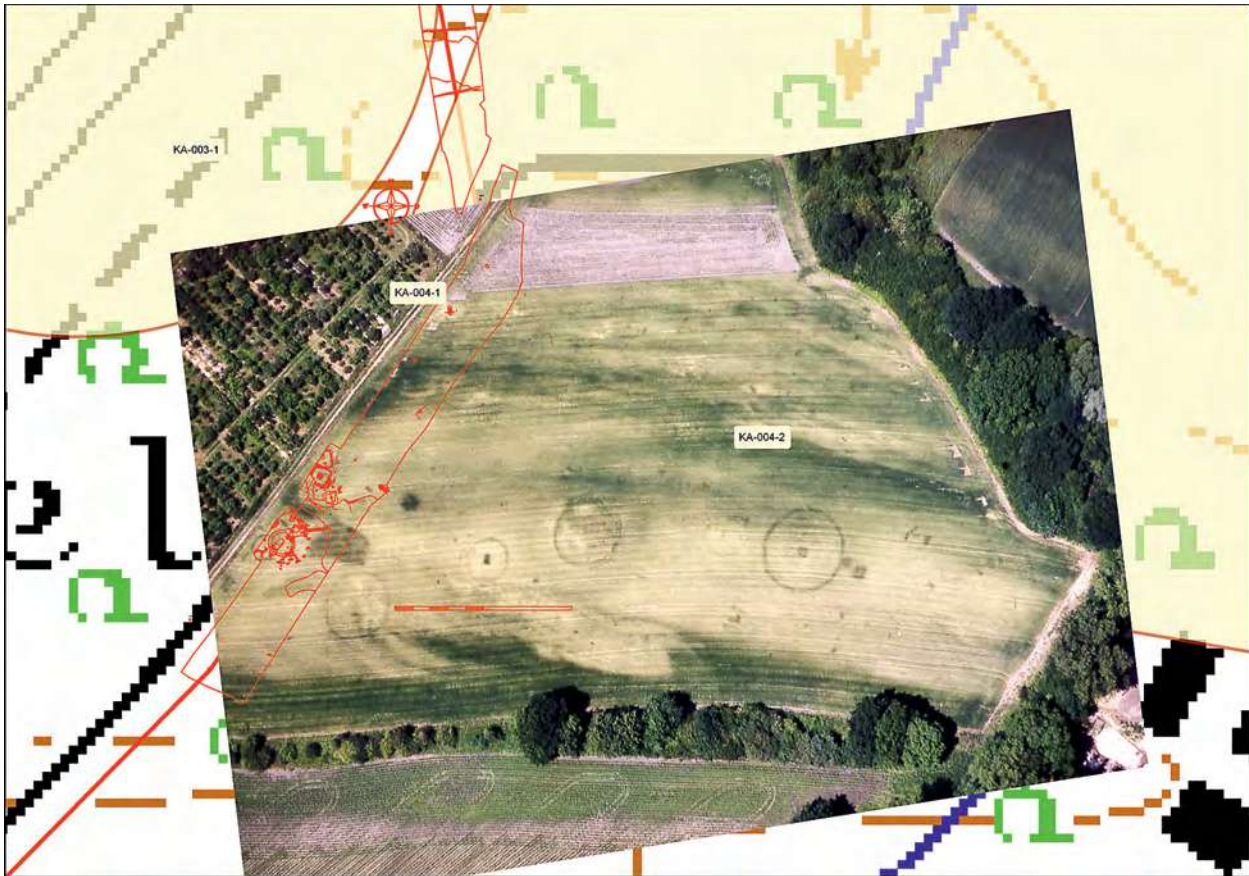


Abb. 12.10: Karlsruhe-Neureut, Fundstelle EPS-KA-004. Entzerrtes Luftbild des Grabhügelfeldes mit dem Trassenverlauf und dem Grabungsgesamtplan (Luftbild Otto Braasch).

bekannten Fundstellen ausgewählt, die ohne den engen zeitlichen Rahmen des laufenden Baubetriebs bauvorgreifend untersucht werden sollten. Für diese Bereiche, die aufgrund zu erwartender umfangreicher und zeitaufwendiger Ausgrabungstätigkeiten auf der Basis von Luftbildern, Begehungsergebnissen oder Fundnachrichten in der Fachliteratur ausgewählt wurden, stand ein Zeitraum von ca. drei Monaten zu Verfügung. Die übrige Strecke muss baubegleitend überwacht und dokumentiert werden, wobei je nach Befundlage ein Zeitraum von rund fünf bis zehn Arbeitstagen zur Dokumentation und Bergung vereinbart wurde, in Einzelfällen auch darüber hinaus.

Als eine der ersten Fundstellen konnte ganz im Westen der geplanten Streckenführung bauvorgreifend im Herbst 2007 ein Grabhügelfeld auf Gemarkung Neureut, Kreis Karlsruhe (Fundstelle KA-004) durch ein Grabungsteam des Landesamtes für Denkmalpflege untersucht werden. Dank regelmäßiger Befliegungen und fotografischer Dokumentation der Luftbildarchäologie hatten innerhalb eines landwirtschaftlich genutzten Areals zu Beginn der 1990er Jahre zahlreiche Bewuchsmerkmale in Form von kreisrunden Verfärbungen mit Durchmesser zwischen 10 m und 40 m dokumentiert werden können. Diese ließen sich zwar eindeutig als Grabhügel identifizieren, eine genauere zeitliche Einordnung war jedoch mangels Oberflächenfunden bislang nicht möglich (Abb. 12.10).

Obwohl die Trassenführung der Pipeline parallel zu einem bestehenden Feldweg verlief, ließ sich ein Eingriff in die archäologische Substanz des Gräberfelds nicht

gänzlich vermeiden; allerdings erlaubten die umfangreichen, für die Pipelinebaumaßnahme notwendigen Bodenbewegungen und die folgende archäologische Untersuchung nun zum ersten Mal Einblicke in die Befundsituation und -erhaltung des Gräberfelds. Dabei wurde deutlich, dass der archäologische Bestand hier massiv von der langjährigen landwirtschaftlichen Nutzung bedroht ist. Pflugspuren durchziehen an vielen Stellen kammartig die Befunde und haben bereits einzelne Bestattungen stark in Mitleidenschaft gezogen, und Beigaben fanden sich stellenweise bereits stark verzogen in den Pflugspuren.

Im Bereich eines Kreisgrabens mit rund 7,5 m Durchmesser, der von einem locker gesetzten Pfostenkranz umgeben war, konnten mehrere früheisenzeitliche Bestattungen freigelegt werden, darunter zwei im NNO-Bereich des Hügels gelegene Körpergräber, die ein reichhaltiges Beigabenensemble aus Ringschmuck und Fibeln bargen und in die Späthallstatt- bzw. Frühlatènezeit datieren (Abb. 12.11). Ein weiteres, an der Außenseite des Kreisgrabens liegendes Grab erwies sich angesichts der Beigaben zweier kleiner Fibeln und einer Nadel im Brustbereich sowie eines Schmuckensembles aus einem unverzierten geschlossenen Halsring mit D-Öse und geschlossenen Arm- und Beinringen als späthallstattzeitliche Bestattung eines wohl weiblichen Individuums.

In den Luftbildern nicht erkennbar, sondern erst im Laufe der Ausgrabungen nachzuweisen, war eine zweite Belegungsphase der Nekropole, deren Befunde knapp 10 m von der Kreisgrabenanlage entfernt

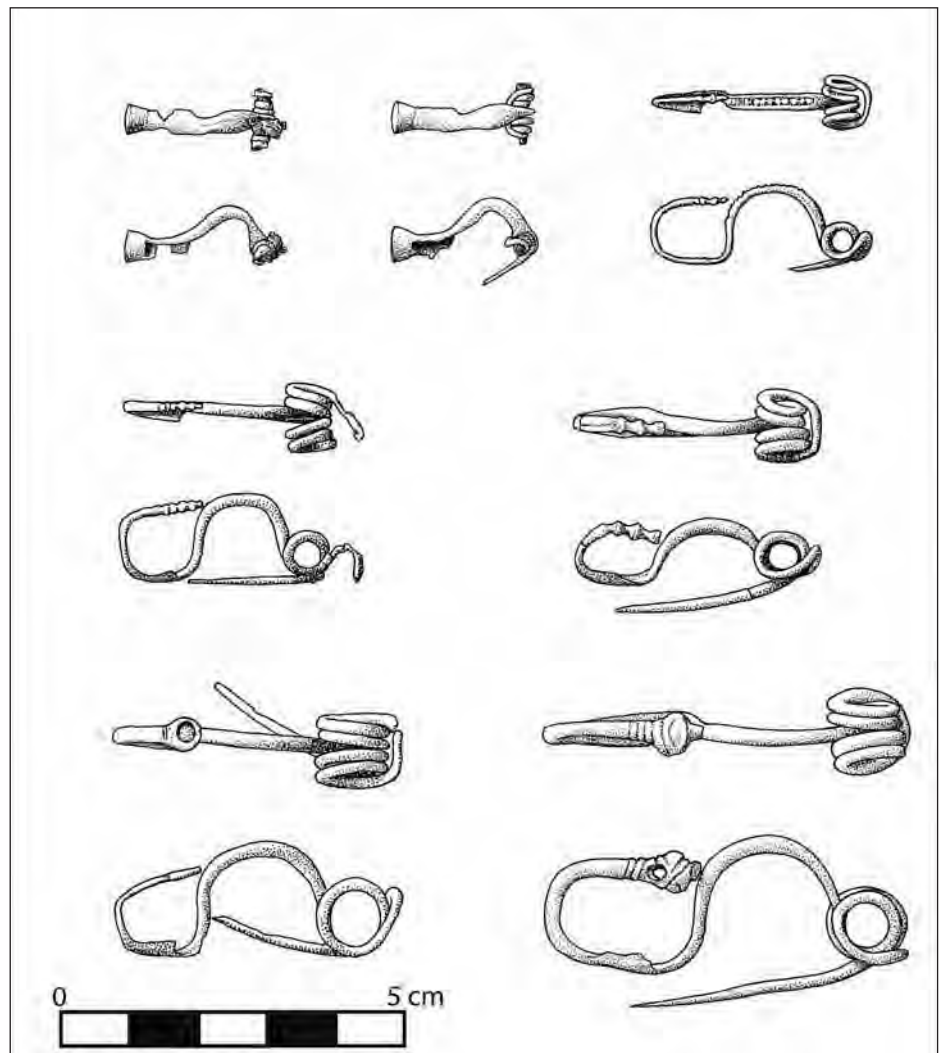


Abb. 12.11: Karlsruhe-Neureut, Fundstelle EPS-KA-004. Fibeln aus den früheisenzeitlichen Gräbern.

gelegen aufgedeckt wurden. So deuten mindestens drei quadratische bis rechteckige Grabgärten mit Kantenlängen von 4 m bis 5,5 m mit Brandbestattungen auf Bestattungstätigkeiten aus der römischen Kaiserzeit (Abb. 12.12).

Nach einem Ortstermin, bei dem die massive Beeinträchtigung des hochkarätigen Denkmals durch die intensive landwirtschaftliche Nutzung den zuständigen kommunalen Entscheidungsträgern eindrücklich vor Augen geführt werden konnte, wurden die Grundlagen dafür gelegt, das bislang als Ackerland genutzte Areal des Grabhügelfeldes aus der Nutzung zu nehmen. Mittlerweile wurde das Gelände in Grünland umgewandelt und der fortschreitenden Zerstörung der Grabbefunde so Einhalt geboten, ein denkmalpflegerischer Nebeneffekt, der ohne die Baumaßnahme und deren archäologische Begleitung allein auf Basis der Luftbilder wohl kaum in absehbarer Zeit realisiert worden wäre.

Eine bislang bei linearen Projekten in Südwestdeutschland einzigartige Befundsituation konnte auf der Trasse der EPS im Kreis Ludwigsburg, nahe Pleidelsheim, beobachtet werden. Auf einer Anhöhe östlich des Neckars konnten zunächst drei eiserne Spitzbarren als Reste eines Depots im Trassenausschnitt



Abb. 12.12: Karlsruhe-Neureut, Fundstelle EPS-KA-004. Gesamtplan der früheisenzeitlichen und römischen Gräber.



Abb. 12.13: Pleidelsheim, Fundstelle EPS-LB-070. Die neu entdeckten keltischen Spitzbarren, die am rechten Neckarufer in Zusammenhang mit der EPS-Trasse entdeckt wurden und zu mindestens zwei Depots gehörten.

dokumentiert werden (Abb. 12.13). Gezielte Begehungen und alte Fundmeldungen in den Ortsakten der Archäologischen Denkmalpflege ließ die Zahl solcher Barren aus diesem Areal auf nunmehr 19 Exemplare ansteigen, die einst zu mindestens zwei, vielleicht drei einzelnen Depots gehört haben müssen, die auf einer Fläche von ca. 300 m × 300 m vergraben worden waren (Bofinger & Schmid 2009). Im Fundareal wurden keine Siedlungsspuren angetroffen, die Hinweise zur Datierung des Komplexes liefern könnten, womit ihre zeitliche Einordnung zunächst einmal nur grob zwischen jüngerer Hallstattzeit und römischer Kaiserzeit zu verorten ist. Da jedoch formal ältere, gestreckte schlanke und jüngere, kurze und gedrungene Exemplare unterschieden werden können (Kurz 1995), dürften die Pleidelsheimer Funde mit einer Länge von 40–50 cm und einem Gewicht von knapp 4–5 kg eisenzeitlichen Ursprungs sein.

Mit diesem Fundkomplex wird ein Aspekt vorgeschichtlicher Landschaftsnutzung aufgeworfen, der sonst wohl kaum ins Blickfeld archäologischer Frage-

stellungen gelangt wäre: In welchem Zusammenhang sind die Barrendepots in dieser Gegend zu sehen? Könnte die Nähe des Fundareals zum Neckar, der als wichtige Verkehrsverbindung bereits in vorgeschichtlichen Epochen eine bedeutende Rolle spielte, einen Grund für die Deponierungen darstellen? Bietet die topographische Situation an einem zum Fluss hin abfallenden Hang, unterhalb einer Kuppe im Lössgebiet Anhaltspunkte für Interpretationen?

Am östlichen Ende des baden-württembergischen Teilstücks der Trasse der Ethylen-Pipeline Süd (EPS) im Nördlinger Ries wurde bei Kirchheim am Ries und Goldburghausen, Gde. Riesbürg, Ostalbkreis, bis zur Landesgrenze nach Bayern ein zusammenhängender Abschnitt von 2,5 km Länge auf der gesamten Trassenbreite von 12 m im Vorfeld der Baumaßnahme archäologisch untersucht. Hier war angesichts zahlreicher bereits bekannter Fundstellen im Bereich der geplanten Trassenführung und weiterer zu erwartender Neuentdeckungen in der Altsiedellandschaft des Nördlinger Rieses ein entsprechend großes Zeitfenster für die

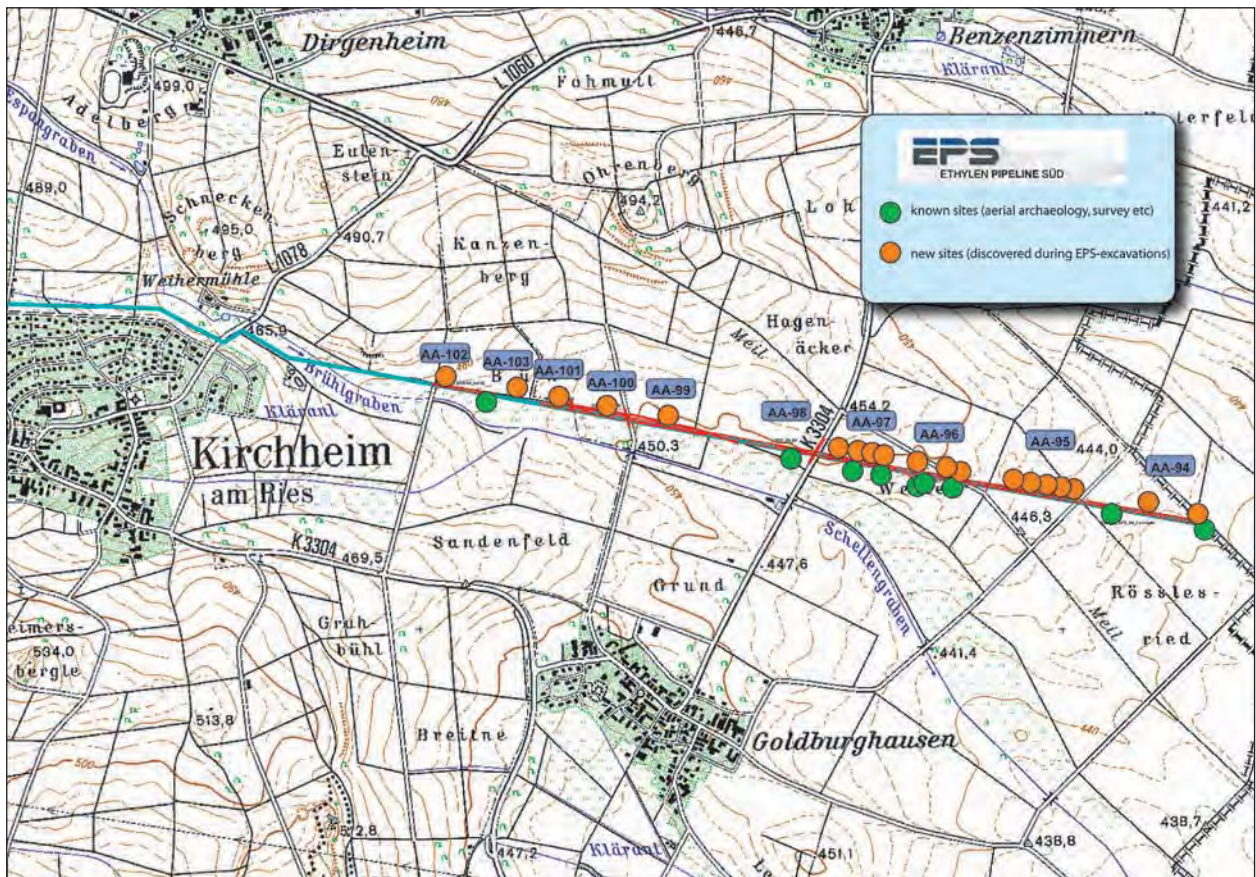


Abb. 12.14: Kartierung der bekannten und neu entdeckten Fundstellen auf dem Abschnitt der EPS zwischen Kirchheim am Ries und der Landesgrenze zu Bayern.

Ausgrabungsarbeiten zu veranschlagen. Der lückenlose Schnitt durch diese Landschaft bot die Möglichkeit einer tatsächlichen Bestandsaufnahme und vermittelte das Bild einer beeindruckenden Dichte der vorhandenen archäologischen Substanz. Zwischen Mai und Oktober 2008 konnten zahlreiche neue Fundstellen aus nahezu allen vor- und frühgeschichtlichen Perioden dokumentiert und die Informationen zu bekannten Fundpunkten teils beträchtlich erweitert werden. So waren im Vorfeld der Baumaßnahme neun Fundstellen bereits bekannt, was den guten Kenntnisstand in dieser Region dokumentiert. Nach Abschluss der Geländearbeiten konnten diesen Fundpunkten 19 weitere hinzugefügt werden, die als Neuentdeckungen das Fundbild auch in einer vermeintlich gut erforschten Landschaft beträchtlich verdichten (Abb. 12.14).

Dabei handelt es sich u.a. um eine bisher unbekannte Siedlung der Linearbandkeramik, die ca. 600 m östlich der Landstraße Goldburghausen–Benzenzimmern erfasst wurde und von der mindestens drei dicht nebeneinander liegende Hausgrundrisse angeschnitten wurden. Des Weiteren konnte wenig davon entfernt jungneolithisches Siedlungsmaterial identifiziert werden. Mehrere bronzezeitliche Siedlungsstellen wurden im Arbeitsstreifen erfasst, wobei unweit der Landesgrenze eine spätbronzezeitliche Grube bereits nach Abtrag der Humusschicht durch enormen keramischen Fundanfall auffiel, weshalb dieser Befund en bloc geborgen und in den Restaurierungswerkstätten des Landesamts für Denkmalpflege sorgfältig freipräpariert wurde.

Weiterhin wurde ein bisher unbekanntes Gräberfeld der späten Hallstattzeit nahe Kirchheim am Ries aufgedeckt, wovon drei Kreisgräben mit großen Kalkbruchsteinen, wohl die Umfassungen heute im Gelände nicht mehr sichtbarer Grabhügel, angeschnitten wurden. Sie wiesen Durchmesser von ca. 19 m bis 22 m auf. Bemerkenswerter Befund war eine Mehrfachbestattung innerhalb des kleinsten Kreisgrabens. Zwischen zwei Skeletten einer Doppelbestattung mit eisernen Lanzenspitzen, Fibeln, Hiebmesser, Ohr- und Armringen und zahlreichen Gefäßen als Beigabenensemble war zusätzlich eine Urnenbestattung deponiert worden (Abb. 12.15).

Bei den früheisenzeitlichen Fundstellen sei noch auf einen Viereckhof – eine der wichtigen Siedlungskategorien der frühen Eisenzeit in diesem Raum (Fries 2005) – mit einer Kantenlänge von rund 60–65 m hingewiesen. Von dieser exakt Nord–Süd ausgerichteten Grabenanlage wurden der südliche Graben mit einer Durchlasssituation und die Südostecke durch die Trasse angeschnitten. Der mehrphasige, bis zu 4 m breite und bis zu 1,50 m tiefe Graben barg umfangreiche Siedlungsabfälle. Um die Ausdehnung der Anlage besser beurteilen zu können und mögliche Reste von Bebauungsstrukturen zu erschließen, wurden im angrenzenden Acker geomagnetische Messungen durchgeführt. Diese ließen erkennen, dass es sich bei der im Trassenstreifen erfassten Torsituation um den einzigen Zugang handelte (Abb. 12.16). Im Magnetogramm erkennbare Gräbchen zeigen eine weitere Unterteilung des Innenraums sowie sowohl innerhalb wie auch außerhalb der Umgrenzung erkennbare Bauspuren in Form von re-



Abb. 12.15: Kirchheim am Ries, Fundstelle EPS-AA-100. Birituelle Mehrfachbestattung. Zwischen den beiden Skeletten befindet sich auf Höhe der Unterarme eine mit Leichenbrand gefüllte Urne.

gelmäßigen Pfostenreihen, unterschiedlichen Gebäudgrundrissen und Gruben.

Unter den römischen Fundstellen sind vor allem die dokumentierten Reste bereits bekannter Villenplätze zu erwähnen sowie eine weitere möglicherweise römerzeitliche Fundstelle unmittelbar an der Landesgrenze zu Bayern. Unter dem heute im Volksmund noch „Römerweg“ genannten Wiesenweg, auf dem auch die Landesgrenze zwischen Baden-Württemberg und Bayern verläuft, wurde ein Schnitt durch diesen Feldweg gelegt. Leider konnte der erwartete Befund im Profil nicht entdeckt werden, jedoch zeigte sich wegparallel beiderseits des Wiesenweges in gut 1 m Tiefe jeweils ein Graben gleicher Breite und Ausprägung. Hierbei könnte es sich um die Straßengräben der einstigen römerzeitlichen Straße handeln, deren Körper bereits modernem Wegebau zum Opfer gefallen ist.

Auch für das frühe Mittelalter gelang eine wichtige Neuentdeckung, waren doch bislang in diesem Bereich archäologische Siedlungsspuren weitestgehend unbekannt. Ein bedeutsames Mosaiksteinchen für die Beurteilung der Besiedlungsgeschichte der Landschaft des westlichen Riesrands stellt in diesem Zusammenhang die Aufdeckung eines vollständigen Grundrisses eines kleinen Gebäudes von 6,5 m Länge und 3,5 m Breite dar, bestehend aus neun regelmäßig angeordneten Pfosten-

stellungen. Dank dem Fund eines Fragmentes stempelverzierter Keramik kann der Befund grob in das 6. oder frühe 7. Jahrhundert datiert werden.

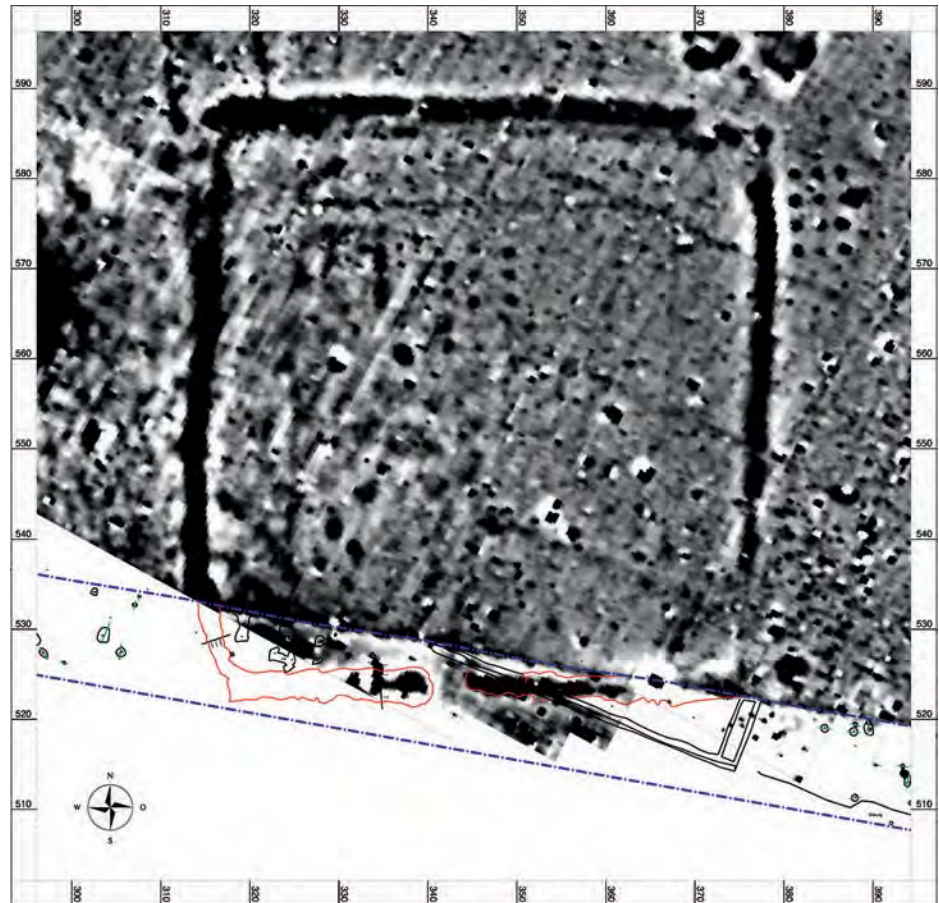
Jüngere archäologische Spuren fehlen im erfassten Trassenabschnitt, bis sie mit Resten frühneuzeitlichen Wegebau wieder einsetzen.

Zusammenfassung und Ausblick

Anhand der vorgestellten Beispiele sollte gezeigt werden, welche Bedeutung der lückenlosen archäologischen Begleitung linearer Großprojekte zuzumessen ist und welche Entdeckungen auch in vermeintlich gut erforschten Regionen Südwestdeutschlands noch gelingen können. Bislang haben die zwei Projekte an der NATO-Pipeline und an der EPS bereits erste Ergebnisse geliefert, die die bisherige bekannte Quellenbasis um wesentliche Elemente bereichern und die Grundlage für die Beurteilung des archäologischen Erbes in einer alten Kulturlandschaft und der denkmalpflegerischen Strategien zu deren Schutz deutlich verbessern können.

Mit weiteren linearen Projekten wie der ICE-Trasse Stuttgart-Ulm, der Süddeutschen Erdgasleitung (SEL) zwischen Mannheim und Heidenheim oder einer Gasversorgungsleitung vom Rheintal bei Rastatt quer

Abb. 12.16: Riesbürg-Goldburghausen, Fundstelle EPS-AA-097. Viereckhof. Ausschnitt aus dem Grabungsplan mit dem Ergebnis der geophysikalischen Prospektion (Graben des Viereckhofes im Trassenbereich rot hervorgehoben).



durch den Nordschwarzwald bis Leonberg werden in Zukunft weitere Räume und Regionen durchgängig erschlossen werden, deren archäologisches Potential in vielen Fällen derzeit noch nicht angemessen beurteilt werden kann, die jedoch sicherlich noch manche Überraschung bereithalten.

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Bildnachweis

1, 3, 4, 14: Kartengrundlage Landesamt für Geoinformation und Landentwicklung, www.lgl-bw.de. – 4, 5, 8: Grafik Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart (LAD), M. Vöhringer. – 6, 9: Zeichnung M. Moll. – 10: LAD, Luftbild O. Braasch. – 11: Zeichnung Ch. von Elm. – 12: LAD, D. Schmid. – 13: LAD, Y. Mühleis. – 7, 15: LAD. – 16: LAD/Terrana Geophysik.

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13 | Excavations on linear projects in Bavaria – problems and strategies

Stefanie Berg-Hobohm

Zusammenfassung: Lineare Projekte im Straßen- oder Pipelinebau haben miteinander gemeinsam, dass durch die konsequente Bauplanung die Arbeitsprozesse direkt voneinander abhängen und ab einem bestimmten Punkt im Bauzeitenplan ein Baustopp zu enormen Stillstandskosten führt, die in der Regel weit über denen der archäologischen Ausgrabung liegen. Das bedeutet im Umkehrschluss, dass notwendige archäologische Rettungsmaßnahmen nur wohlgeplant ausgeführt werden.

Die geringe Anzahl von potentiellen Maßnahmeträgern bei linearen Projekten führt zusätzlich zu der Notwendigkeit, mögliche Risiken für einen reibungslosen Bauablauf so exakt wie möglich zu beschreiben und Prozesse vorzubereiten, um Baustillstände oder das Unterbrechen bestimmter Arbeitsabläufe innerhalb der Baumaßnahme zu verhindern und dies unter der Maßgabe bodendenkmalpflegerischer Auflagen so weit wie möglich umzusetzen.

Erfahrungsgemäß können derartige Negativfälle auch im Planfeststellungsbeschluss zu der Aussage führen, dass aus unzumutbaren Kostengründen baubegleitende Ausgrabungen nicht möglich sind, womit die Möglichkeiten von Untersuchungen stark eingeschränkt werden.

Anhand von Beispielen aus Ausgrabungen im Zuge linearer Projekte der vergangenen Jahre in Bayern wird gezeigt, welche Arbeitsprozesse und Strategien entwickelt wurden, um innerhalb eines vorher festgelegten Terminplans ein Maximum an archäologischer Dokumentation zu erreichen, und wie der Druck auf die ausführenden Grabungsfirmen so weit wie möglich reduziert werden kann, damit genügend Zeit bleibt, den archäologischen Befund auch im Hinblick auf eine wissenschaftliche Bearbeitung vollständig zu dokumentieren.

1. Bavaria

Bavaria (*Freistaat Bayern*) with an area of 70,553 km² (27,241 square miles) and almost 12.5 million inhabitants is located in the south-east of Germany and is the largest federal state (*Bundesland*) by area. Its capital is Munich in Upper Bavaria. Bavaria is divided into 7 administrative regions known as *Regierungsbezirke*: Upper Franconia (*Oberfranken*), Middle Franconia (*Mittelfranken*), Lower Franconia (*Unterfranken*), Swabia (*Schwaben*), Upper Palatinate (*Oberpfalz*), Upper Bavaria (*Oberbayern*) and Lower Bavaria (*Niederbayern*).

The most important landscapes relevant to archaeological sites in Bavaria are the regions with fertile soils such as the *Nördlinger Ries*, the *Ingolstädter Becken*, the lower and upper terraces along the important rivers Danube, Isar and Inn etc., the fertile triangle of the Main district and the gravel plane around Munich (*Münchner Schotterebene*).

2. The administration

The archaeological monument conservation administration in Bavaria, the *Bayerisches Landesamt für Denkmalpflege*, is the central state-run authority for monu-

ment conservation in Bavaria. The main office is located in Munich, with branches in Bamberg, Ingolstadt, Nürnberg, Regensburg and Thierhaupten (fig. 13.1). The au-



Fig. 13.1: The administrative zones of Bavaria and the offices of the Bavarian *Bodendenkmalpflege*.

thorities in Landshut and Würzburg have been closed und merged with Bamberg und Regensburg. It is likely that the authorities in Nürnberg und Ingolstadt will follow and be merged with the authority in Thierhaupten.

3. The history of monument conservation in Bavaria

As early as 1835 King Ludwig I issued an ordinance for the conservation of monuments and established a *“Generalinspektion der plastischen Denkmäler des Reiches”*. Prince Regent Luitpold, the fifth son of Ludwig I, signed an ordinance on the 6th September 1908 establishing the *“Generalkonservatorium der Kunstdenkmale und Altertümer Bayerns”*. This was the moment of birth of the Bavarian *Landesamt für Denkmalpflege (BLfD)*. Although the conservation and the inventory of monuments both below ground and of buildings started, it took a long time to implement a monuments conservation law – until 1973. Even so it was the first in Germany. Today the inventory is made up by 120.000 buildings, 900 ensembles and around 50.000 archaeological sites (*Bodendenkmäler*) in Bavaria. Still the problem remains, that the knowledge of archaeological monuments has not been acquired by systematic prospection.

4. The legal basis

Although the legal basis is 35 years old (Eberl et al. 2007), it remains almost unchanged and is still in use. In comparison with the legal bases in the new federal states, who were provided with modern standards upon the reunification of Germany, the Bavarian monuments laws lack the clause that the initiator of a building project has to pay the costs for the archaeological excavations should they be necessary. On the other hand a comprehensive preservation of the historical and archaeological heritage and of the soil as an archive is explicitly stated in the *Bayerische Verfassung*, in the *Bundesnaturschutzgesetz*, *Bundesbodenschutzgesetz* and the *“Bundesgesetz zum Schutz des archäologischen Erbes”* as well as in the so-called *“Valletta Treaty”* or *“Malta Convention”*. The initiator of the building activity is responsible for the comprehensive preservation of the archaeological heritage and the appropriate strategies for preservation must be prepared by the initiator. This is based in the Valletta Treaty, in the *Umweltverträglichkeitsprüfungsgesetz (UVPG)* and in the *Bayerisches Verwaltungsverfahrensgesetz (BayVwVfG)*.

As has just been stated, when an archaeological monument is likely to be affected by a building activity, the initiator needs official permission, containing all additional requirements – for example that an excavation must take place before the building activity can begin. *“Wer auf einem Grundstück nach Bodendenkmälern graben oder zu einem anderen Zweck Erdarbeiten auf einem Grundstück vornehmen will, obwohl er weiß oder vermutet oder den Umständen nach annehmen muß, daß sich dort Bodendenkmäler befinden, bedarf der Erlaubnis. 2 Die Erlaubnis kann versagt werden, soweit dies zum Schutz eines Bodendenkmals erforderlich ist” (BayDschG Art. 7 Abs. 1: [1] 1).*

This permit will be granted by the district office or by the *Regierungsbezirke*, which normally follow the list of recommendations.

Another important point, which is stated in the Valletta Treaty of 1992, is the acceptance of responsibility for the costs of the work on scientific papers. The Valletta Treaty was not signed by the German parliament and the federal states until 2002. Unfortunately the Treaty has not yet been fully adopted by the federal states of Germany (Hönes 2005).

At present, the initiator of the building activity has to pay for the archaeological fieldwork and all of the documentation of the excavation, including the cleaning of sherds, the packing of finds, all the analogue and digital documentation and a summary of all drawings as well as a written summary of all actions and outcomes (Guideline for excavations in Bavaria 2008).

But neither the Federal Republic nor the Free State of Bavaria (*Freistaat Bayern*) were prepared to accept these principles for their own building activities, especially in the case of the construction of federal and state roads. This was changed in 2008.

Beside the monument conservation laws, there are other important European regulations such as the environmental risk assessment (*Umweltverträglichkeitsprüfung*) and the environmental audit (*Umweltprüfung*), which can be helpful in accomplishing the main goal – the conservation and the protection of the site by excavations if it cannot be conserved *in situ*.

Unfortunately it is still not possible in Bavaria to fall back on a large-scale monitoring for the protected commodities such as sub-surface monuments for the environmental risk assessment. Normally the building application contains only the listed monuments and an attempt to forecast the unknown monuments that might come into conflict with the building activities.

5. The organisation of excavations

Until 1993 the *BLfD* had carried out all excavations. This was because the *BLfD* was provided with funds and was able to organise job creation schemes (ABM). After 1993 the job creation schemes came to an end and most of the funds were withdrawn. This negative development was, at the same time, the hour of birth of commercial archaeology (Fehr 2008, 110 f.). Today there are circa 45 excavation companies working in Bavaria.

In the 1990s, the staff of the *BLfD* was reduced by eight per cent, after 2004 the staff was cut down again by about ten per cent. Today there are on average one or maybe two archaeologists, one excavation technician and administrative personnel responsible for each *Regierungsbezirk*. Five archaeologists are continually listing and appending the inventory of archaeological monuments. At present the main tasks of the *Landesamt (Praktische Bodendenkmalpflege)* are the professional assessment of development schemes and the monitoring of excavations as legally required.

6. A short review of large-scale linear projects

Two large-scale excavations that were carried out by the *Landesamt* on itself, should serve as examples.

The construction of the Rhine-Main-Danube canal, which was built on a 34 km section between 1974 and 1992, belongs to the largest linear building projects archaeologically examined so far in Bavaria (fig. 13.2). On

Fig. 13.2: Building of the Main-Danube canal in the Altmühl valley. View from Kastlhof/Pillhausen to the East in the direction of Kelheim, Lkr. Kelheim, Reg.-Bez. Niederbayern.

an approximately 70 km long stretch of the valley in a corridor of up to 200 m width, an estimated 3000 ha of the landscape of the *Altmühltal* were completely transformed. The excavations were carried out selectively. The archaeological investigations showed that the ratio of unknown archaeological monuments to known archaeological monuments is about five to one. Nineteen volumes of excavation reports on this project have already been published (Archäologie am Main-Donau-Kanal 1994–2007).

Another important investigation took place between 1995 and 2002 prior to the construction of the ICE (Inter-city Express) route between Nuremberg and Munich (Nadler 2003; 2008) (fig. 13.3). 180 ha were investigated along 52 km. In this case prospecting provided information for the selection of excavation areas. These investigations confirmed the impression gained during the excavations of the Rhine-Main-Danube canal. Furthermore it was exciting and surprising that the deeply sedimented floodplains (*Talauen*) showed excellent organic preservation conditions. Our knowledge of archaeological monuments is insufficient and the danger is very high that monuments are being destroyed without being identified.

In 2003 the *Bayerisches Landesamt für Denkmalpflege* was restructured (Mosel 2006). The management decided that the linear projects should be revised and a new team was set up to ensure that standardised projects could be carried out and that the problems involved with road works etc. could be better identified and solved. Large-scale excavations in the commercial and industrial areas of the urban centres remained under the control of the departments in the *Regierungsbezirke*.

In Bavaria, linear infrastructure such as state and federal roads and motorways, waterways, pipelines, railways and telecommunications lines, are examined primarily to see how far archaeological monuments might be affected (fig. 13.4). On the basis of these appraisals, consultations take place with the aim of reducing the destruction of monuments as far as possible and improving the conditions under which trial trenching and excavations are carried out. New information about both previously known and new sites is added to the new Bavarian inventory system and reused for the further planning of new schemes.

7. The planning

A precondition for co-ordinated and transparent preliminary planning is the mapping of known and suspected archaeological sites and monuments. At the outset, in 2004 the new inventory did not include all known sites and monuments. The information still had to be compiled from the pre-existing files – which was not immediately possible for large projects due to lack of staff. This led to serious problems.



Fig. 13.3: The stretch of the ICE route between Ingolstadt and Nuremberg. View into the Schwarzach valley at Großhöbing, Lkr. Roth, Reg.-Bez. Mittelfranken.

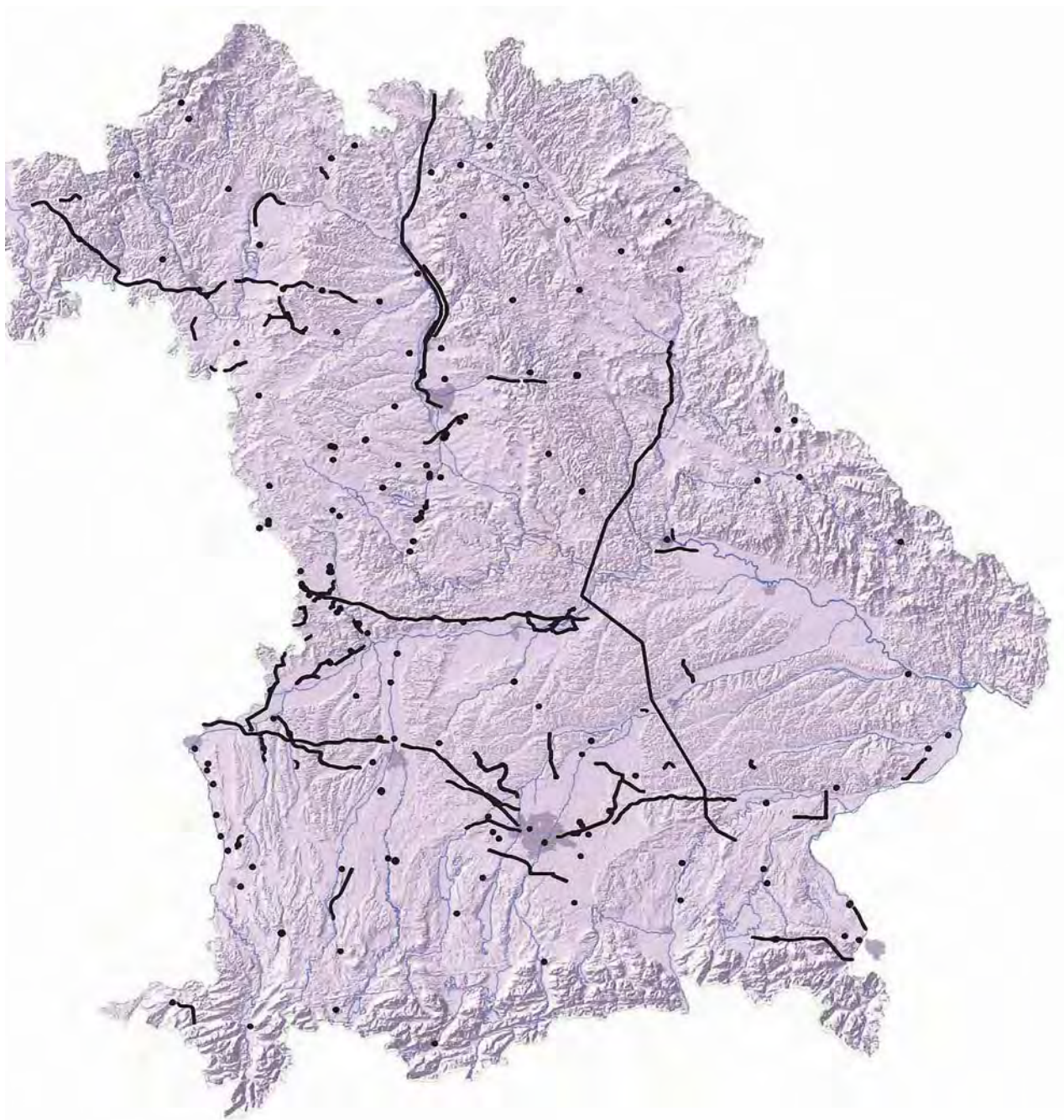


Fig. 13.4: Construction and conversion plans of linear projects in Bavaria dealt with in the Munich office between 2005 and 2008.

In the meantime known monuments have been digitised and included in our *Fachinformationssystem*, a web-based GIS (Wanninger 2008). In this system both new plannings and excavated areas can be georeferentially represented, thus facilitating future work. Nevertheless the state of knowledge on archaeological sites in Bavaria varies. For example, in the eastern parts of the *Regierungsbezirk Oberbayern* or in the *Steigerwald* the number of known archaeological sites is very low and it is difficult to predict the situation with regard to “hidden” archaeological monuments.

8. Linear projects²

Linear projects such as road or pipeline construction have in common that their direct operational sequences are interdependent: when a construction project, e.g. a pipe-

line, comes to a halt for whatever reason at a certain point in the construction period plan, enormous costs ensue. These can far exceed those of an archaeological excavation. It is therefore imperative for the acceptance of excavations in linear projects that archaeological rescue measures be very well planned and implemented (fig. 13.5). The project investor and the *BLfD* make a concrete agreement about the approach to the project, including the prospective costs. Normally the cost of the archaeological excavation is calculated on the basis of an average sum for each kilometre of unprospected territory of unknown archaeological potential combined with an average for settlement favourable areas or areas with known sites. In the case of a 102 km-long section of the ethylene pipeline south (*Ethylen-Pipeline Süd*, *EPS*, see below) in Bavaria, the construction consortium refused to accept the sum calculated by the Bavarian conservation admin-

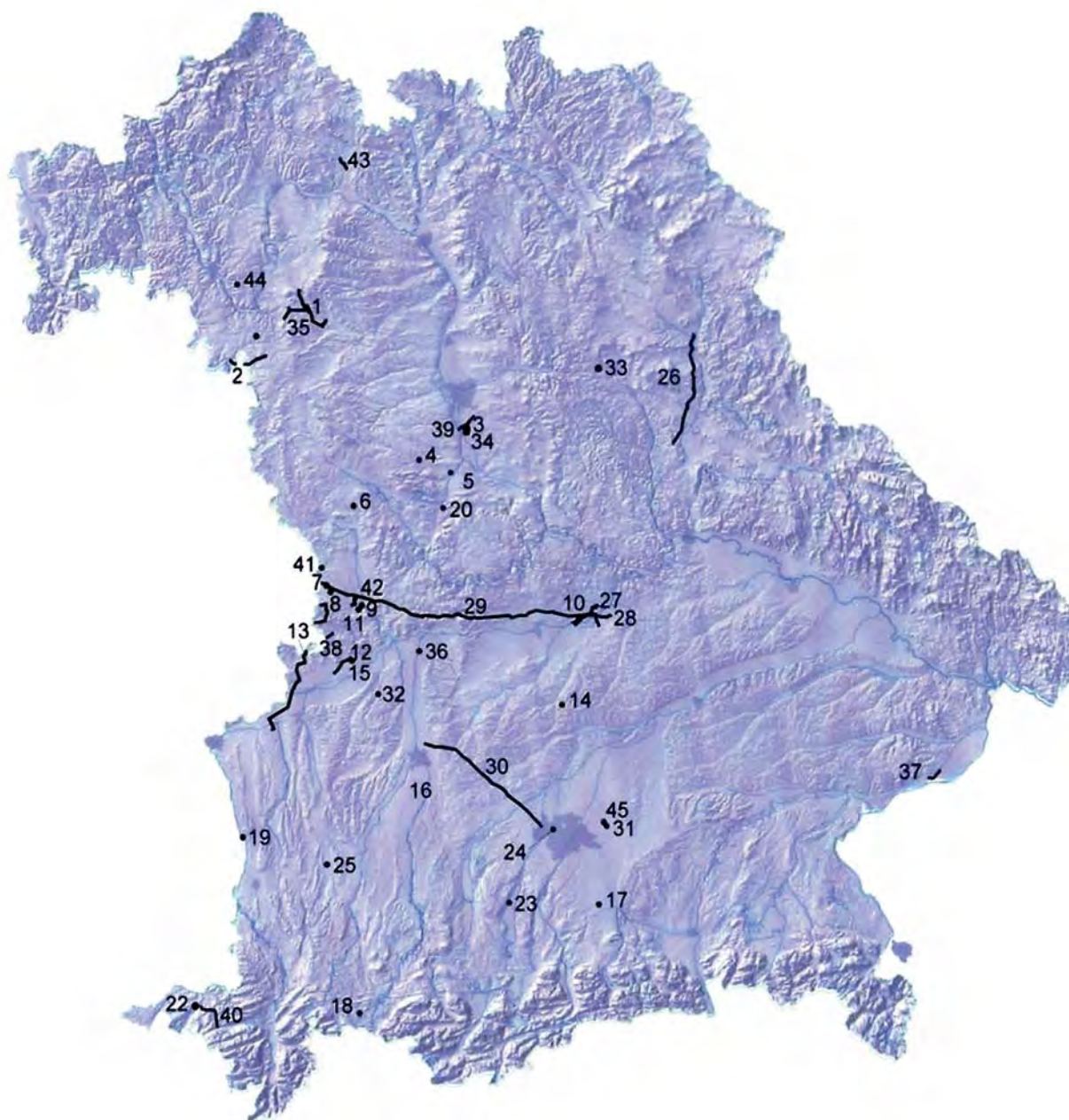


Fig. 13.5: Plans of linear projects, which were implemented and were accompanied by archaeological firms due to restrictions of the Landesamt.

istration. Instead they contacted the Ministry directly and the government of Upper Bavaria (*Oberbayern*) with figures culled from excavations on the ethylene pipeline Stade–Teutschenthal in Saxonia-Anhalt years before (Gebers 2004). After consultations with the colleagues from Saxonia-Anhalt, these figures could be refuted. Technical exchanges with the colleagues from Baden-Wuerttemberg and Rhineland-Palatinate also played an important role, since all were affected by this project. This shows the importance of inter-state exchange.

8.1 Special situations in pipelines with cross-sections over DN 800³

For safety reasons the findings in the direct proximity of the future pipeline trench could not be documented and sectioned, because the construction company

feared that pits and spoil heaps resulting from this activity would result in an unstable and dangerous surface for the pipe-laying plant. This safety concern meant that the excavation of each archaeological finding had to be examined by a safety officer from the construction company. In some parts the excavation could be accomplished only after the conclusion of work on the pipeline. In such cases the findings were covered and protected by construction foil and documented later.

8.2 Best practise for the constructions of pipelines

The removal of the topsoil and the constant movement of heavy plant leads to substantial compaction of the B- and C-horizons. Due to this the archaeological findings within the route-range are strongly impaired or destroyed. An additional destruction of the possibly



Fig. 13.6: The route of a gas pipeline 500 m east of the Roman fort *Celeusum* (Pförring, Lkr. Eichstätt, Reg.-Bez. Oberbayern) showing the pipe trench after finishing the excavation. A Roman ditch is visible under the colluvial covering that protected the surviving archaeological features.

still preserved archaeological structures takes place after completion of the route work due to breaking hooks on the B/C-horizons and deep ploughing on the A-horizon (fig. 13.6–8).

General procedure is to remove 0,40 cm of soil. In the trial trenches more can be removed, but only up to the depth of the bottom of the future pipe trench.

An agreement is made with the contractor that the excavation can take up to 14 days per pipeline ditch section. Known archaeological sites are dug two months in advance of construction. It is therefore important that information about extant sub-surface sites is available and as complete as possible.

Because of the financing problems for the procedures and the excavations, the approach in roadwork projects differs from pipelines. Here the stress is on sondages and excavations on known and possible archaeological sites. Total archaeological accompaniment of the removal of the soil on large roadwork projects is not possible at present.

8.3 Pipelines with small cross-sections – communal projects

The pipelines with smaller cross-sections for the regional supply of natural gas and water are not built in open construction. More often pressure pipes for gas, water and sewage or empty conduits for telecommunication systems are embedded using special ploughs. In addition, the number of HDD (Horizontal Directional Drilling) is on the increase. Whereas the HDD method might not generally harm the sub-surface archaeological record, the start and end points of this type of enclosed construction require punctual ground opening, which should be supervised by archaeologists (fig. 13.9).

8.4 Pipeline project: Ethylen-Pipeline Süd (EPS)

The excavations within the route-range of the ethylene pipeline south (see fig. 13.5, no. 29) are almost complete. The expropriation procedure (*Enteignungsverfahren*) for the last ten kilometres still has to be finalised in Bavaria. The project began in autumn 2007 with excavations continuing through the winter 2007/08 (Strobl & Gläser 2009). The directive of the *Landesamt* for a systematic investigation of the 102 km long and 12 m broad stripe through Bavaria by an excavation team was successfully accomplished. The excavation crew was appointed by the representative of the project. In addition, an archaeological coordinator had the task of bringing the archaeological work into line with the phasing of the construction of the pipeline and a geoarchaeologist could be requested for problematic



Fig. 13.7: Removing about 0.30–0.40 m of the topsoil with a wide-shovelled excavator brings good results. With a second excavator the remaining surface is cleared away either in stripes or laminar under the supervision of an experienced member of the excavation team (gas pipeline Irsching–Forchheim, Lkr. Eichstätt).



Fig. 13.8: After refilling the pipe trench, the surface is flattened and deep-ploughed (gas pipeline Irsching–Forchheim, Lkr. Eichstätt).

pedological situations and for the documentation of the landscape archive.

Unfortunately, for property-legal, permission-legal and nature protection-legal reasons the respective areas could not be processed successively. For the excavation teams, who had to work on the entire route, this meant permanently changing sequences of excavations and constant reorganisation of the excavation crews. The pipeline traverses two regions, the *Nördlinger Ries* and the *Ingolstädter Becken*, which were typically favoured by the settlers in pre- and early history due to their fertile soil. But especially the unknown places in between those well-known regions were of interest.

The following example of a La Tène grave shows how important a systematic archaeological supervision is: the site was unknown and the discoloration of the deep grave was hardly discernable. Even so, in the community of Egweil (Lkr. Eichstätt) a middle-La Tène burial of a young female adorned with iron fibulas and a complexly arranged belt could be documented (Eggli & Herbold 2009). The grave is a single finding. The bones had completely vanished. The belt was removed *en bloc* and excavated under controlled conditions in the



Fig. 13.9: A 4,5 km long pipeline for natural gas was built by enclosed construction (Maihingen-Marktoffingen, Lkr. Donau-Ries, Reg.-Bez. Schwaben); the pipeline required 41 holes, which were supervised. One of them showed remains from an unknown settlement of the Linear Pottery Culture.

conservation laboratory of the *Landesamt* (fig. 13.10–12). The manner in which the well preserved 135 cm long bronze belt chain was worn could be clarified: the belt was cramped several times in front of the belly. This find brings light to similar finds from the graveyard “Steinbichel” of Manching, which were excavated in the years 1892/93.

On the EPS pipeline the rare find of a mass grave of a battlefield from the Thirty Years’ War – the first to be archaeologically documented in Bavaria –, could be investigated in Alerheim (Lkr. Donau-Ries, Reg.-Bez. Schwaben). Although many written documents existed, the archaeological evidence had not until then been discovered. Now a mass grave of 70 soldiers could be documented (fig. 13.13). Due to the finds including a Louisdor of 1641 (fig. 13.14), and the fact that the bones showed massive traces of violence, the burial can be connected with the well-known battle of Alerheim of 1645 (Berg-Hobohm 2008b).

8.5 Prospection and excavation in roadworks

It was advantageous that the building and maintenance of the motorway A 8 on a 43 km stretch between Sulzemoos and Augsburg-West was allotted to a private consortium (Arge A+). Importantly, the archaeological measures required were precisely described in the concession contract between motorway management South Bavaria and the consortium A+. The scope of the excavations and the costs could hardly be predicted, since there were no possibilities for pre-project prospecting. By the continuous integration of the archaeological co-ordinator and the inclusion of

the excavation planning into the complete project-flow chart and by the flexible employment of the excavation personnel, the problems could be solved. 19 investigation areas each of about 10 km were identified using such criteria as two known archaeological sites or topographic and pedological aspects. On a third of these sites sub-surface monuments were discovered and excavated.

The motorway crosses the northern area of the Alpine foothills (Upper *Süßwassermolasse*), hill country to the northwest to the *Münchner Schotterebene*. On the one hand, rivers flow into the Isar in a northeasterly direction, on the other hand to the north into the Danube. The region is partly densely wooded and the knowledge about archaeological sites is scant.

A small section of a deserted unknown medieval village or manor was found near Adelzhausen (Lkr. Aichach-Friedberg) directly at the edge of the Ecknach (Berg-Hobohm & Schmid-Hecklau 2008). Adelzhausen’s earliest historical tradition goes back to the 8th century. The excavated area revealed some postholes forming a 12 m × 9 m large wooden building dating to the 12th century, which was apparently renewed several times until the 14/15th century, at which point it went into disuse. The postholes could indicate a large granary. Since bricks were wedged in some of the large and deep postholes, it can be assumed a brick building had been demolished in the vicinity in the Middle Ages.

The excavated part might show a farmyard perhaps of a *Hofmark* (Kopfmann 2008), a special form of manor with petty jurisdiction rights in the duchy of Bavaria, especially within the sphere of influence of the *Wittelsbach*

Fig. 13.10: A middle-La Tène grave in Egweil (Lkr. Eichstätt, Reg.-Bez. Oberbayern) during the excavation; the bones have not survived due to the low amount of lime in the ground, the metallic finds are well preserved.



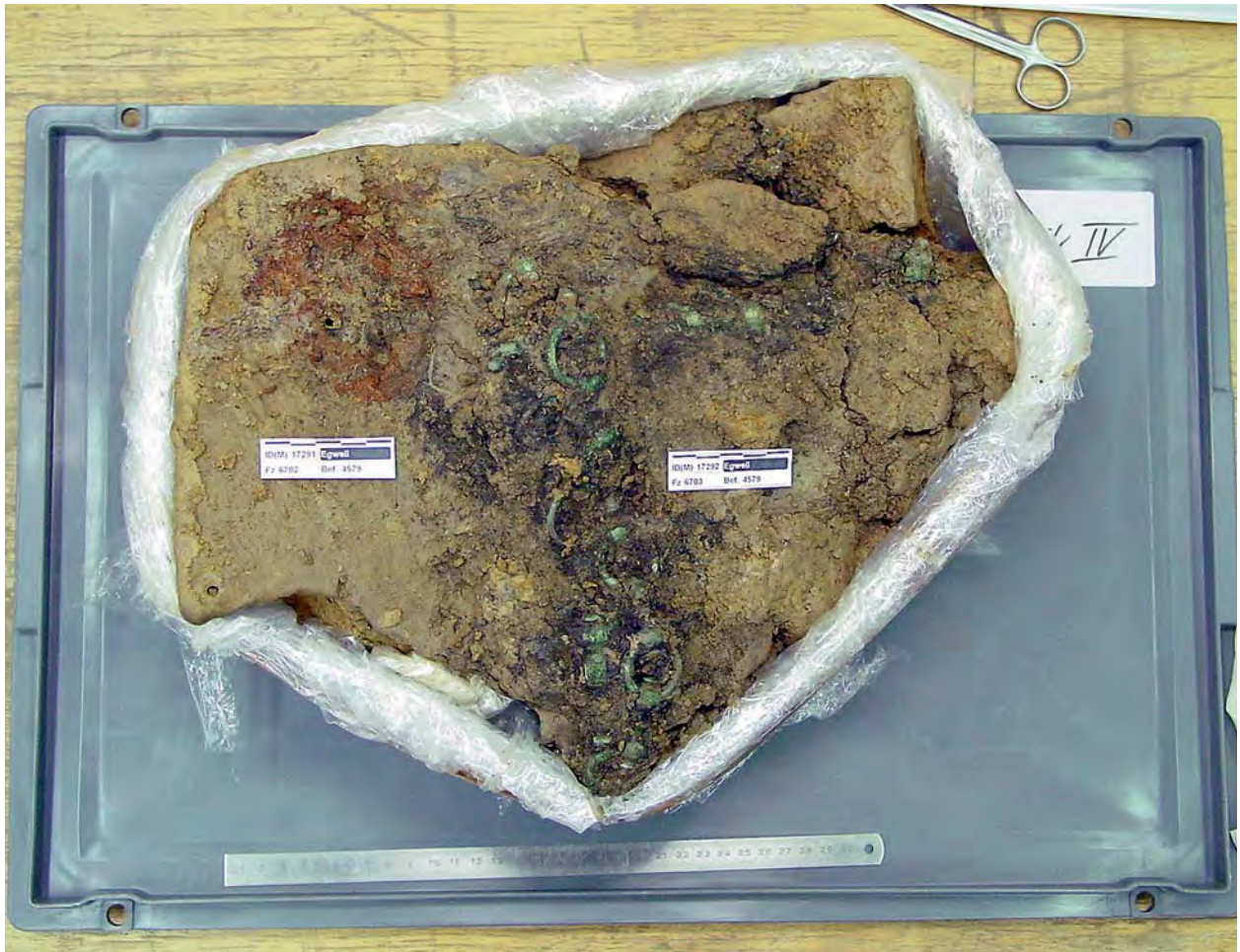


Fig. 13.11: The bronze belt chain during the excavation in the conservation laboratory at the Landesamt.



Fig. 13.12: The belt chain after the excavation. The preservation was very good, the links of the chain are still movable.



Fig. 13.13: A mass grave of soldiers, who fell 1645 in the battle of Alerheim (Lkr. Donau-Ries, Reg.-Bez. Schwaben).



Fig. 13.14: Alerheim. A Louisdor from the year 1641.



Fig. 13.15: Adelzhausen (Lkr. Aichach-Friedberg, Reg.-Bez. Schwaben). The aquamanile, ceramic, after restoration. One leg and the spout are missing.

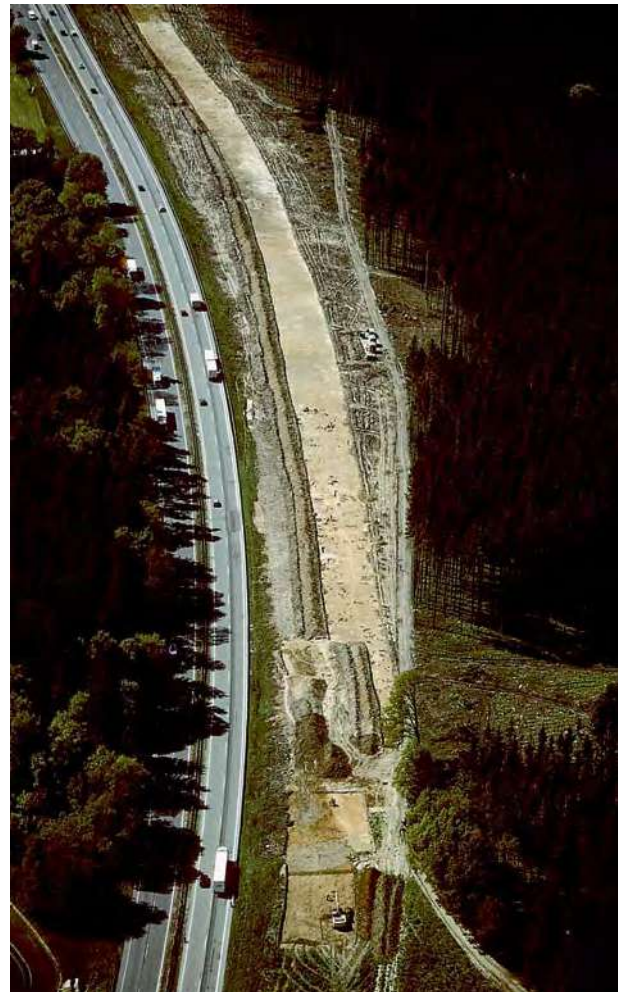
Fig. 13.16: The situation of the Roman road and the Bronze Age settlement beside the motorway A 8 north Adelzhausen (Lkr. Aichach-Friedberg, Reg.-Bez. Schwaben).

duchy of Bavaria in the 12th century. Archaeologists and historians are equally in demand to answer questions about the significance and the tasks of this previously unknown site. The find material, including ceramic(s), window glass, other glass fragments, bronze and iron as well as stove tiles show parallels to urban life rather than to the rural area. An aquamanile was found; a find-type, rarely documented in a rural context.

The aquamanile is 15.8 cm high and 22 cm long (fig. 13.15). The sharp erect ears of the strongly stylised animal could indicate a dog. Often these vessels with heads or/and bodies have resemblances to lions, griffins, horses or mythical figures. Their origin can be seen in the islamic bronze aquamaniles which were brought from the crusades in the 12th century by crusaders and merchants. Aquamanilia (of lat. *aqua*: water, *manus*: hand, water containers for hand-washing) are found in noble households from the 12th century onward.

About 1 km to the north of the Ecknach valley, almost parallel with the motorway A 8, the remains of a hardly visible Roman road are listed as an archaeological site (fig. 13.16). The directives of the *Landesamt* included the documentation of the surface of the visible street by tachymetric survey as well as a documentation of the street body and the roadside ditches by sections. Unfortunately, in the sections neither a roadbed nor the ditches of the roman road could be recognised. But prehistoric findings were made and therefore the whole area had to be opened. Only by this procedure was it possible to recognise the road ditches as weak discoloured linear features.

Some prehistoric ceramics led to an excavation of a 1,4 km long and 30 m broad strip within the future motorway route, where a Bronze Age settlement was recognised. Unfortunately, only a few of the postholes can be assigned to regular arrangements indicating north-south aligned timber buildings. The identification of the findings was very difficult and the preservation of ceramic(s) partially very bad.



Another unknown Iron Age settlement could be determined at the eastern edge of the *Lechterrasse* and at the foot of the older moraine (*Altmoräne*) Derchinger Berg, circa 10 km east of Augsburg (fig. 13.17). Several hectares had to be excavated because the settlement lies in the area of a rain retention basin. Several four- and six-post-hole buildings could be recognised, well known in the Hallstatt and La Tène periods.

Fig. 13.17: Derching, Lkr. Aichach-Friedberg, Reg.-Bez. Schwaben. Overview of the excavations on the site of an up to then unknown Iron Age settlement.



9. Summary

There is a wide and diverse range of new results, due to systematic excavations. Much new information on unknown sites has been recovered, augmenting the knowledge on monuments and on the change of the landscape considerably.

A co-operation on a German or even European scale seems from my point of view to be most important. Also there is the need of standardised and comprehensive procedures for archaeological measures.

It is an ongoing problem – not only in linear projects – that the scientific approach to archaeological excavations is at present financially unfeasible.

English revised by David Bibby

Notes

- ¹ A good review of the development of the archaeological department: Fehr (2008).
- ² A short summary of the projects and of the problems in linear projects: Berg-Hobohm & Schlicksbier 2007; Berg-Hobohm 2008a; Berg-Hobohm 2010.
- ³ DN 800: German Industrial Standard for pipelines with a diameter of 800 mm.

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14 | Berlin Brandenburg International – the capital city's new main airport. Planning, excavation and results of the archaeological investigations

Sabine Eickhoff (with a contribution from Ulrich Dirks)

Abstract: Berlin's new main airport Berlin Brandenburg International (BBI)¹ should commence operations by the year 2012. To this end the existing airport Berlin-Schönefeld is being rebuilt and expanded in size to over 1000 hectares, threatening a wealth of archaeological heritage ranging from Neolithic settlement to modern villages. Using the example of this large-scale construction project the legal framework for archaeological investigation will be illustrated, which is regulated by laws pertaining to Brandenburg's Heritage Conservation, Environmental Impact Assessment and a circular from the Brandenburg Ministry for Town Planning. On the basis of the "polluter pays principle" an investigative procedure has been established that comprises the field survey of suspected site locations, trial trenching of known sites and, lastly, full excavations. Selected sites will be drawn on to demonstrate the possibilities, limitations and methodology of this practice.

The second part of the paper focusses on the results. Newly discovered Middle and Late Neolithic settlements and burial grounds have transformed a region once considered meagre in heritage into one characterised by a continually occupied Neolithic settlement cell. Of more recent origin is the deserted Late Medieval village Diepensee. In Brandenburg the excavation of a nearly complete enclosed, nucleated village is unique, and here, for the first time, the complete population of a village that existed for roughly 150 years could be anthropologically evaluated.

The year 2011 should see the end of construction to Berlin's new main airport. The existing airport Berlin-Schönefeld is being rebuilt and expanded into the new Berlin Brandenburg International (BBI). The development covers an area of more than 1000 hectares and threatens numerous archaeological monuments ranging from Neolithic settlement to modern villages. Using the example of this large-scale construction project I would like to illustrate the legal framework required for archaeological investigation in Brandenburg as well as detailing the documentary sequence developed for such large-scale archaeological projects. Additionally, I will discuss excavation strategies and, finally, present you with the latest results of the region's Neolithic and Late Medieval settlement research.

Legal framework

The legal basis for archaeological projects linked to the construction of the new airport is – naturally – Brandenburg's heritage conservation law.² This is not limited to any particular cultural epoch (BbDSchG §§ 1 [1]; 2 [1]), enabling the protection of even the most recent heritage as long as it is of public or scientific interest (BbDSchG § 2 [2] <4>). Enshrined in this statute is the obligation to record archaeological heritage. This is financially regulated by the "polluter pays principle" (BbDSchG § 7 [3]), in other words, the developer foots the bill. Originally, only 8 archaeological sites registered in Brandenburg's sites and monuments records lay within

the prospective development zones of the new airport and its transport infrastructure. Of these, 7 are situated on the periphery of the actual airport grounds and, therefore, were only partially threatened by the development. Alone the Late Medieval deserted village and 18th century manor of Diepensee, situated at the centre of the construction zone, faced total destruction. Outside the development zone the locations of numerous archaeological sites are known. The lack of systematic archaeological evaluation right up until the start of the planning phase made the consequent discovery of numerous new sites within the airport grounds very probable.

The protection of such as yet undiscovered sites is regulated by laws governing Environmental Impact Assessment.³ These statutes bestow protection on a number of public concerns, such as heritage conservation, by explicitly stipulating a review and evaluation of the immediate and future effects a construction project will have on them (BbgUVPG § 2 [1] <3>). This policy offers fundamental protection for the known and very numerous unknown archaeological sites.

Recognition of this policy came, after lengthy negotiations with the Brandenburg Ministry for Town and Road Construction, on 11th September 2001 in the form of a circular detailing a cooperation agreement between the heritage authorities and road construction agencies (Runderlass 2001). Hereafter, monument protection was organized into three legally binding stages: firstly, field survey (field walking, test-pitting) of locations suspected of containing archaeological sites;

secondly, trial trenching and thirdly, full excavations of known sites. The cost of archaeological investigation is carried by the investor. This procedure applies to all construction activity on country and federal highways within Brandenburg.

During the past 7 years we have been able to implement this procedure on nearly all public and private construction projects, in addition to Berlin's new airport BBI.

Topography of the area

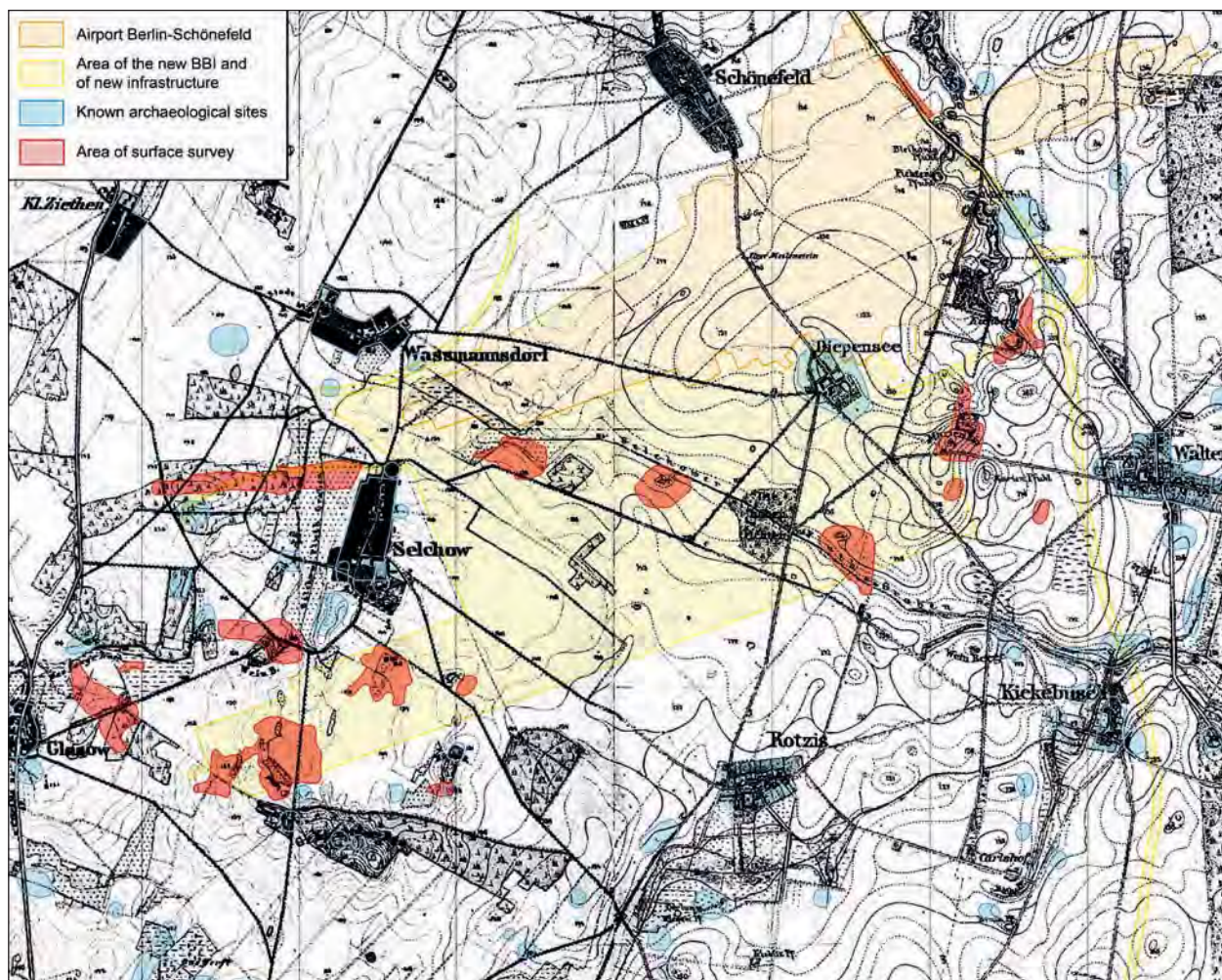
Before I discuss the work of the field survey at BBI, I would like to describe the designated construction zone. This was located immediately to the south of the extant airport Berlin-Schönefeld and covered 1042 ha. Its glacially shaped landscape belongs geologically to the northeast Teltow plateau and ranges in height from 37 to 53 m a.s.l. The soil here is characterised by a dominance of heavy to medium loams. An artificially built flood ditch connects wetland areas near Selchow and Kiekebusch. Various small elevations rising to a maximum height of 53 m (Marienberg) are located to the north. The lightly undulating terrain south of the flood ditch is bordered by wetlands and the Groß Kienitzer hills. This area is characterised by numerous small bodies of water, some of which are only seasonal. In

addition to these late-glacial kettle ponds, some of the holes owe their recent origin to mineral extraction.

Surface surveys

The first stage of archaeological investigation, surface survey, was undertaken in the winter of 1998/99 with an investigation of areas most likely to contain still undiscovered sites (fig. 14.1). Trial trenching of the entire construction zone was deemed too expensive (Martin et al. 1997 ff., Kennziffer 93.51 [3]).⁴ Areas likely to contain sites were initially defined by desk-based research involving the appraisal of cartographic and historical documentary sources in combination with numerous criteria such as the proximity to water, wetlands and other sites, prevailing topographical and pedological conditions, distribution of find spots, aerial photography and written sources. Positive correlation of any number of criteria and areas was interpreted as likelihood of past settlement activity. However, let us be in no doubt that the criteria are not unequivocal and do not uniformly apply to all sites. A south-facing slope with fertile soil near water is not always settled on, but more often than not it is. On the other hand, find spots are also located in areas unfavourable to settlement. According to these criteria areas of possible settlement activity were defined and bordered. The ensuing sur-

Fig. 14.1: Airport Berlin Brandenburg. Plane survey sheet (on map of 1869) with all archaeological sites (known in 1998) and all areas of survey.



face survey was split between field walking, test-pitting and core-sampling. The subsoil was deemed unsuitable for geophysical survey.

The field walking systematically covered 360 ha.⁵ Find spots were surveyed with a Total Station and distribution maps were plotted. Due to pressure of time some areas were walked only once; find-rich areas, however, were surveyed several times. Furthermore, 615 test-pits were dug on a 25 m grid (peripheral areas on a 50 m grid) which corresponded to the National Grid coordinate reference system. The spoil from the 0.25 m² test-pits was sieved by layer, and the sections were drawn and selectively photographed. Core-sampling supplemented the test-pitting in wetland areas and in the vicinity of the frozen lakes during the winter.

By the end of the survey in spring 1999 the number of known archaeological sites threatened by the airport construction had risen to 24, covering an area of over 150 ha. Together with the authorisation of the airport construction in summer 2004, measures explicit to the protection of archaeological heritage were embedded in the Environmental Impact Assessment.⁶

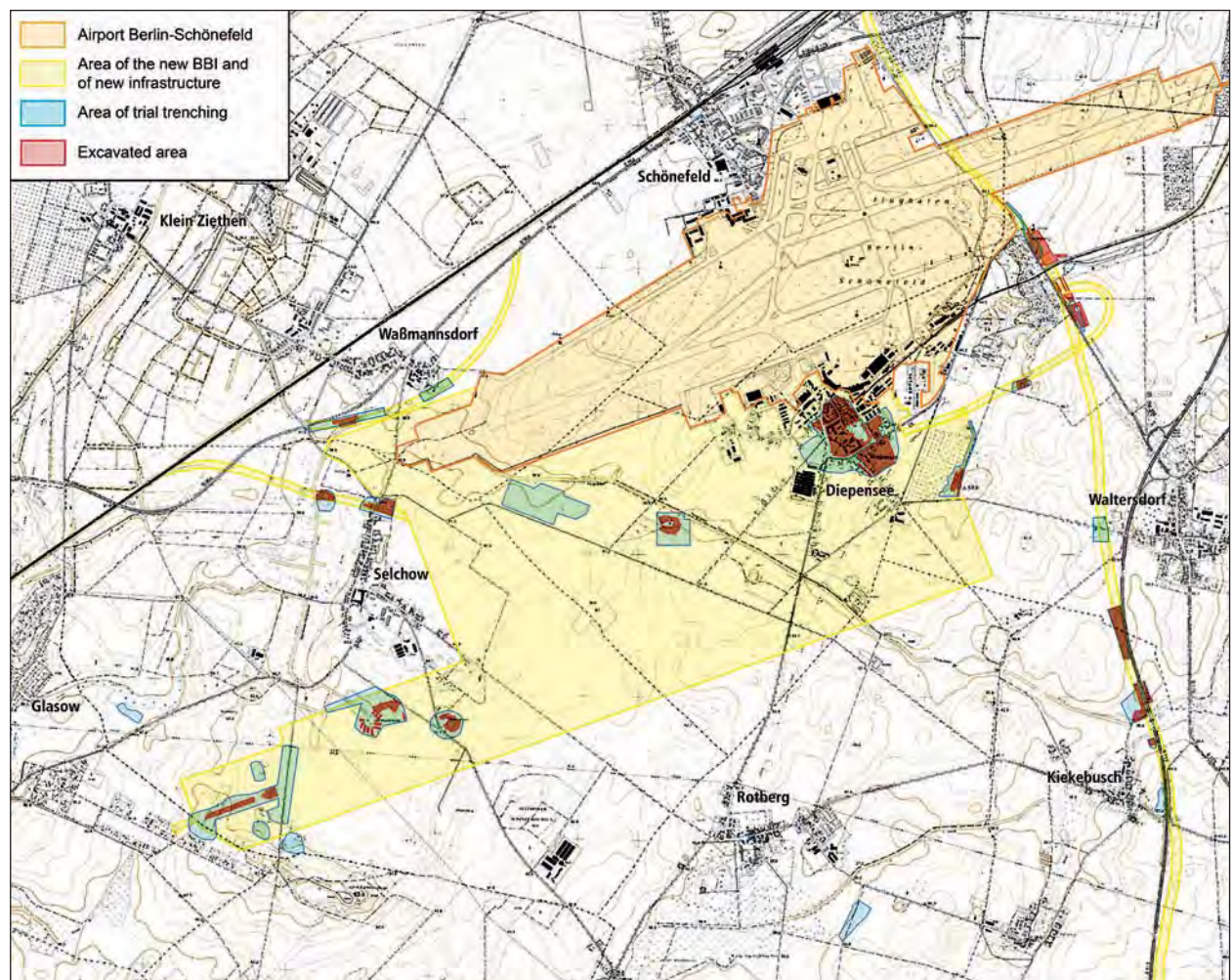
The development of a heritage protection concept necessitated enhancing our knowledge of the existing archaeological sites and damage assessment. Mitigation with the responsible planning agencies of the Berliner Flughäfen GmbH brought modifications to the road and train access, resulting in a reduction of vul-

nerable archaeological sites to "only" 21. Henceforth, the planned earth-moving and the extent of the destruction were precisely defined. The extent of site destruction at the perimeter of the airport was somewhat reduced as plans for landscaping were shelved mainly due to environmental concerns.

Trial trenching

The next stage commenced with preliminary excavations of the 21 archaeological sites in the form of trial trenching (fig. 14.2). As a rule, the topsoil was mechanically stripped from c. 5 % of a site's total area, the trenches being c. 1.50 m in width (digger shovel). The trenching generally corresponded to the area's relief and occurrence of archaeological contexts, which were recorded and the finds retrieved. Foremost, this enabled an assessment of the site's physical extent, preservation, density and distribution of the contexts, as well as providing dating material and indications of possible multi-period occupation. Information was also gained on soil structure and the presence of groundwater – important for the preservation of organic finds. Now that the duration and scope of the archaeological documentation were known, the financial framework of the project could be negotiated with the investor.

Fig. 14.2: Airport Berlin Brandenburg. Plane survey sheet with areas of trial trenching and excavated areas.



The trial trenching of 21 archaeological sites produced varied results: 7 sites could not be confirmed at all and the areas were released to development; however, 14 sites were excavated between 2005 and 2007, sometimes within quite small areas. The trial trenching proved useful in correcting the results of the surface survey by demonstrating post-depositional alteration to sites through plough damage. This can be responsible for horizontal displacement of surface finds, and the surface density of finds is often an indication of underlying archaeological destruction.

A major phase of trial trenching was focussed on almost the entire deserted medieval village and 18th century locality of Diepensee. The excavation of the settlement initially involved a written statement of intent and extensive desk-based research. Diepensee was one of many villages that were established early in the 13th century in connection with German eastward expansion. One reason for Diepensee's location was the presence of a glacial kettle-pond that gave the settlement its name, meaning literally "deep lake". A testament from the year 1348 mentions a Jacob Dypense as a witness, and the Land Register of Karl IV, written in 1375, describes the settlement as deserted or partly deserted. Documents from 1416 and 1599 also refer to Diepensee as abandoned. Furthermore, historical sources from the 15th and 16th centuries confirm this status; however, two documents from the years 1438 and 1599 make reference to a homestead suggesting a limited resettlement (Beck 2003a; 2003b). The founding of an outlying estate in the middle of the 18th century led to a repopulation of Diepensee. Later, the main road was lined with late 19th century housing, in which era the manor house was also erected. After World War II, the outlying zones of the village were urbanized (Rose 2003a; 2003b).

At the beginning of the archaeological fieldwork⁷ the village was still inhabited, and the trenching, therefore, was located in the limited space available, such as along main pipelines and in areas previously cleared of ordnance (Stark 2004). After the relocation of the residents it was possible to increase the size of trenching between the buildings and in the gardens. Trenches of up to 150 m were stripped on arable land surrounding the village. The excavation sections and drillings revealed a total of nearly 400 features, such as pits, post-holes, ditches and ovens. This number may well exceed several thousand if the whole area of the former village is taken into account. However, it must be stressed that only 4–5 % of the village area was trenched, substantially less than is required for accurate evaluation. Several areas, including a garden-centre, the former piggery and large areas adjoining the lake were omitted from study due to the presence of toxic waste.

Datable material ranging back to the Bronze Age and Neolithic was present in around one third of the contexts. Neolithic finds were concentrated to the south and west of the lake, whilst Bronze Age ceramic was also found to the north and east of the lake. The medieval structures were concentrated in 6 areas distributed around the lake. They were initially interpreted as farmsteads, separated by gardens, croplands or similar. From Late Medieval to recent times no settlement continuity could be discerned. The distribution of finds from the 18th century up until modern times was concentrated around the manor house and the village main road.

The results of the trenching reduced therefore the area requiring full excavation to 14.5 ha, and at this juncture of the investigation it became clear that an understanding of the village itself and its earlier settlement form were the main research goals. Of specific interest was an elaboration not only of the history of the settlement but the physical circumstances in which the medieval village population lived, in other words, aspects that are usually neglected in historical sources and, therefore, research. The written statement of intent foresaw completion of the entire archaeological project within two years on the basis of an excavation team of 25 people.⁸

Excavations and research projects

Before I cover the research results concerning the Late Medieval and Neolithic settlements in the third part of the paper, I would like to elaborate on the methodology and logistics of the main excavations. Nevertheless, I would first like to draw your attention to post-excavation work. In Brandenburg, heritage law does not cover this aspect of research. The investor bears the expenses for fieldwork only. This is becoming an ever-increasing problem, and our archives and collections are full of excavation material and records awaiting study. Due to on-going staff reduction it is now almost impossible to clear the backlog of work along with running the daily business. However, cooperation with universities and research bodies remains a high priority, and I am in a position to report that the research project Diepensee is making good progress, not least owing to the great personal engagement of all concerned. In autumn 2008, the Research Society of Germany (DFG) approved a research project focussing on medieval villages of the 13th to 15th centuries that have been documented within the framework of large-scale excavation projects in Brandenburg. This will permit post-excavation study of Diepensee and two similarly excavated villages in the opencast mining region of lower Lusatia (http://www.bldam-brandenburg.de/projekte_c/dorfer.html).

Before excavation could begin the former housing had to be demolished. All the cellars, however, were left *in situ* owing to the destructive effect their removal would have had on the surrounding archaeological record. The complete site itself was divided into 13 areas. It was not possible to impose a coherent excavation grid system on the whole site due to the vagaries of construction/demolition logistics. Moreover, delays were experienced over a period of two years owing to issues such as pollution eradication, fly-tipping, woodlands not cleared on time and the resettlement of the environmentally protected Common Spadefoot frog (*Pelobates fuscus*) from the lake environs. Consequently areas were excavated at various times.

Most of the excavation areas displayed horizontal stratigraphy and thus one excavation *planum* (artificial level) sufficed; in only three areas was a second *planum* necessary. Excavation was constantly supplemented by surveying: the in-coming data being edited and graphically presented with AutoCAD and ArchäoCAD software.⁹ The resulting plans were printed and subsequently coloured and described on site. In contrast to a site hut and generator, the installation of an office container with mains electricity greatly simplified the logistics of this work.

Single features were documented by up to 6 *plana* and simple single- or cross-sections. The village ditch was excavated by means of box-sections. The grave fills were sieved, as were the areas of prehistoric flint scatters. Metal detectors were gainfully employed in the excavation of the village main road. Numerous soil sections documented the geo- and pedological characteristics of the excavation areas.

Complex features were recorded using photo-mapping techniques and the software PhoToPlan.¹⁰ Photography took the form of colour-slides, black and white negatives and digital. For overviews aerial work platforms – 10 m in height – in addition to aerial photography were employed on a regular basis.

Extensive sampling of lime and mortar was undertaken for the purpose of building research. Wood was sampled where possible for dendrochronological analysis and species identification. Prehistoric contexts were sampled for the purpose of radiocarbon dating. A total of 250 soil samples were taken from the Late Medieval contexts and wet-sieved on site for macrobotanical remains. Core sampling was limited to the lakeside area due to the heavy pollution of lake silts.

The Late Medieval village of Diepensee

In total, more than 8000 contexts were recorded. A number belonged to Mesolithic flint scatters, as well as Neolithic and a huge Bronze Age settlement. The majority of contexts, however, were Late Medieval and present Diepensee as a systematically estab-

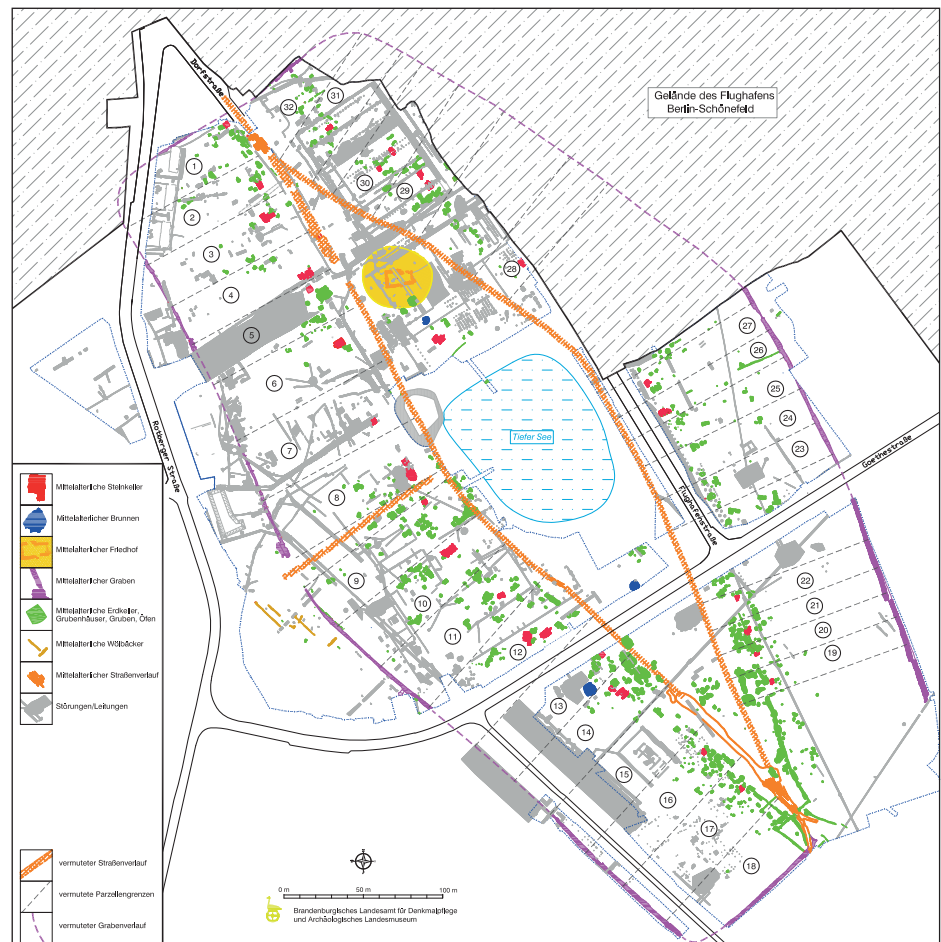
lished and enclosed village with plots, roads and common land as its centre.¹¹ The oldest sample of wood originated from a well and dates back to the winter half-year of 1223/1224,¹² indicating settlement activity nearly 130 years earlier than the historical source from 1348 would suggest. The reference to a deserted village in the Land Register of Karl IV, from 1375, thus provides us with a *terminus ante quem*. In support of this thesis are the archaeological finds, which date the abandonment of the village to the middle of the 14th century.

Village plan

One characteristic of planned nucleated villages at the time of the German eastward expansion is their fortification (fig. 14.3). Diepensee was enclosed by a ditch that in plan was symmetrically shaped in the fashion of an elongated hexagon, measuring some 600 m (north-south) by 340 m (east-west). The ditch was 30–90 cm deep and 1.2 m to a maximum of 3.6 m wide. Unfortunately, only the southeast corner could be excavated. The locations of the main entrances on the north and south village borders were inferred from the position of the main road. The exact position and structure of the gates, however, can only be assumed. The western entrance seemed to consist of a natural 23 m wide earth bridge. A small 1 m wide gap located in the middle of the east ditch may have provided another small passage for pedestrian use.

In two areas the inner side of the ditch displayed lines of densely set postholes. Their depth was only a few centimetres, but their location suggests the function

Fig. 14.3: Airport Berlin Brandenburg. Plan of all medieval structures of the deserted village Diepensee.



of a palisade, constructed perhaps of planks or wick-work.

Two roads bisected the village, enclosing a spindle-shaped area of common land. The simple earth-road was 5 m wide and striated with numerous parallel tracks, whose dark fill differentiated them from the lighter coloured subsoil. The tracks were very probably made by iron-shod cartwheels. Another road leading to the western entrance was only recognisable as a small featureless strip between two plots. If we assume the presence of a road connecting the eastern ditch, the village thoroughfare then takes the form of a crossroad linking the central common land with the village entrances.

Building structures

Diepensee appears to have been structured internally with the bordered plots, marking property division and perhaps preventing livestock from roaming too freely. The excavation revealed small ditches and fence lines. In accordance with the distribution of the Late Medieval cellars, this suggests land division of 33 distinct plots. As one finds in villages of today, small medieval farmsteads were also characterised by differential building elements. Apart from a main building, a farmstead would contain several adjoining buildings, which were used for storage purposes, barns or livestock. Some may have housed craft or industry.

Although the poor preservation conditions made the recognition of post-built constructions difficult, the south of the village appears to have possessed several barn-like structures. Most of the adjoining buildings had simple cellars dug into the loam; some of them even included wooden installations. Simple cellars like this were characteristic of rural settlement construction, and may be identical with the so-called *cellaria*, i.e. store-houses cited in medieval law. Apart from the cellars, several pit-dwellings were also excavated. One contained a hearth with a stone-packed base and a complete rounded jar.



Partly-cellared main buildings were located close the roads. These basements were simple pit constructions without recognisable installations and a few of them comprised wooden sill-beam or post-built constructions. However, the majority of the cellars were stone-lined. Forty cellars were recorded revealing numerous distinct construction phases. Many cellars were filled with the incinerated remains of the half-timbered houses above them and therefore were rich in finds.

The size of the cellar interiors varied significantly. One end of the range was occupied by very small cellars measuring 2–4 m², whilst the largest examples had floor plans measuring 10–20 m². The average floor size was 7 m². The preserved depth of the cellar floor varied from 60 cm to 1.5 m. The cellars usually contained a single room; occasionally two, the floors mostly being composed of compacted loam, but sometimes planked. In most cases the cellar entrance was located outside the building at the rear or to the side, and consisted of a simple ramp or stairs furnished with wooden or stone steps. One outstanding cellar (context 3150) filled with burnt material was a double-roomed structure with a common stairwell comprising of 11 steps (fig. 14.4).

Between the road-side buildings and the gardens that extended to the village border, numerous features related to economic activity were situated, including ovens, hearths, lime-, tanning-, retting- and pitch-pits in addition to treading circles. Furthermore, the function of several hundred pits was interpreted as mineral extraction or rubbish disposal. The village water was supplied by three stone-built wells; one being located on a private plot and two centrally on common land.

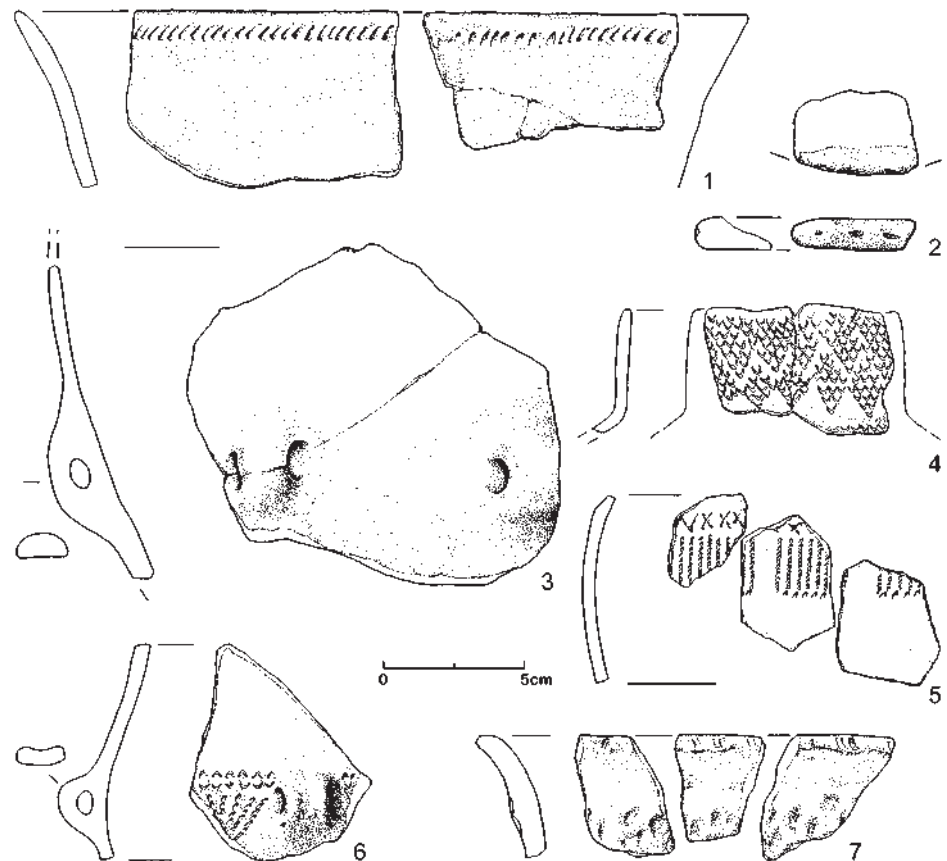
Church and cemetery

The remains of the former church, in the form of foundation trenches, were situated on common land to the north of and near the lake. In recent times a garden-centre occupied this location, resulting in deep intrusive soil-disturbance, hence no church floor remains. Despite this, the foundation trenches enabled a reconstruction of the ground plan, which included a single-aisled nave with a retracted rectangular choir and a semi-circular apse.¹³ The remains of the foundation trench were only a maximum of 25 cm deep, and it appears that the foundations had been systematically removed. The fill of the ghost trenches contained recent Stettin ware and oven tiles, which place the last phase of the church's destruction in the 18th century. Masonry from the church ruins was reused for Diepensee's resettlement, which took place around 1750.

The church was encircled by a graveyard containing 418 inhumations. Bones found scattered in recent soil disturbance indicate a minimum number of individuals of 485 whose burials spanned a period of 150 years. The church was located centrally to the cemetery, which is notable for its circular shape. According to Christian burial rites nearly all the graves were orientated eastward. A small number of individuals who were inhumed otherwise can, on the basis of other abnormalities, be regarded as special cases. The majority of the individuals were buried singly in a supine extended position with their arms straight

Fig. 14.4: Diepensee. The double-roomed, stone-lined cellar 3150 has a common stairwell comprising of 11 steps.

Fig. 14.5: Neolithic ceramic found in the area of the deserted Late Medieval village Diepensee: Fragments of Funnel Beaker (1), so-called *Backteller* (2) and a lugged flask (3) of the Funnel Beaker Culture; fragments of Globular Amphorae (4, 5) and a cup (6) of the Globular Amphora Culture; fragments of a so-called *Wulstleistentopf* of the Corded Ware Culture (7).



by their sides or folded over their abdominal region. The grave pits were oval or oblong, and a minority of the deceased were placed either on wooden biers or in rectangular wooden coffins. The majority of the individuals, however, were wrapped only in a burial shroud. A special type of grave pit which displayed a neatly cut niche for the head was recorded in 13 cases and contained, almost exclusively, adult male individuals wrapped in a burial shroud. This special type of grave form is familiar from medieval contexts of the 10th to 12th centuries in Western Europe. Unfortunately, it is not the remit of this article to discuss the anthropological results and their fascinating insight into the demographics of medieval village life (Jungklaus 2008a; 2008b; 2008c).¹⁴

Finds

The inventory of grave goods was scanty and included an iron sickle, a pin, a finger ring, three belt-buckles and a clay marble. In addition, the area bordering the former garden-centre was investigated. Many cubic metres of re-deposited soil were sieved resulting in the discovery of additional finger rings, pins, buttons, decorated hooks etc.

The inventory of finds from cellars and pits dates exclusively to the 13th and 14th centuries, and is comprised mostly of hard Grey-Ware, Near-Stoneware and the occasionally glazed earthenware. The pottery typology is dominated by rounded jars followed by bulbous jugs; flat-based forms, along with beakers and bowls are extremely rare (Eickhoff & Stark 2006). Small finds associated with agricultural or domestic economic contexts consist of objects such as sickles, shovels, knives, drills and spindle whorls. Keys and door fittings were often found in cellar entrances (Zwischenlandung 2006). A

very extraordinary find was recovered from a rubbish pit, namely a bracteate. Parallels exist in Bohemia that date to about 1250 (Haupt 1976).¹⁵

At this juncture late in the paper I would like to focus on another thematic complex: newly discovered Middle and Late Neolithic sites. Numerous finds from these periods have changed our appreciation of prehistoric settlement and burial in the region surrounding the new airport. Prior to the recent excavation campaigns the terrain was known to be poor in Neolithic material. The systematic nature of recent investigations has altered this picture, and we now know that this area was a continuously occupied Neolithic settlement cell. Newly discovered sites belong to the Funnel Beaker Culture, the Globular Amphora Culture and the Corded Ware Culture.

Neolithic settlement cell

Ulrich Dirks

Ceramic belonging to three distinct Neolithic cultures can be found in the area of the deserted Late Medieval village Diepensee. The oldest finds belong to the early Funnel Beaker Culture, or accordingly date to the transition horizons leading up to the older Funnel Beaker Culture (c. 4000–3500 B.C.). Beaker-formed vessels with funnel-shaped, outwardly curved rims, occasionally decorated with a single or double rows of stab ornamentation, are common to this period (fig. 14.5,1). Ceramic discs usually 20–30 cm in diameter, so-called *Backteller*, probably functioned as lids (fig. 14.5,2). Fragments from Diepensee display thickened, smooth rims

and a mat impression on the inside in addition to stab ornamentation on the rims. The remains of a bulbous vessel with a small lug-like band handle resemble a lugged flask, characteristic of the early Funnel Beaker Culture in Denmark (fig. 14.5,3).

Ceramic from the older eastern Funnel Beaker Culture (Waltersdorfer Group and Britzer Culture) is absent in Diepensee.

The area surrounding the lake was resettled in a later phase of the Globular Amphora Culture (c. 3200–2700 B.C.). A number of fragments from globular amphorae, the name-giving type-find, originate from this epoch (fig. 14.5,4,5). Equally characteristic of this cultural epoch are wide-mouthed bowls (fig. 14.5,6). Using cord technique, decoration such as rhombic forms, triangles and zigzag meanders are found mostly on the shoulder and rim areas of the vessels. Fairly common are so-called semi-circular stamp motives. Occasionally a simple enhancement of the vessel's shoulder is achieved with rows of fingernail impressions or sculpted bands of fingertip-impressed decoration.

The corded ware phase of the Late Neolithic (c. 2700–2100 B.C.) in Diepensee is confirmed only through secondarily deposited vessel fragments found in a medieval ditch. The shards of two pots with sculpted application (*Wulstleistentöpfe*) display a funnel-formed, notched rim and rudimentary wavy sculpted bands with pinched impressed ornamentation in the neck area in addition to a thickened rim decorated with stab ornamentation and sculpted wavy bands on the lower neck region of the vessel (fig. 14.5,7). Two base shards have a clear footed form and a wall shard of a grooved beaker can also be dated to the Corded Ware Culture.

The finds and contexts of all the Neolithic cultures in Diepensee are distributed around the lake. The relatively small number of both indicates the existence of a small settlement and possibly single buildings.

As no finds from the older Funnel Beaker Culture were found we can assume a settlement hiatus of a few

centuries up until the beginning of the Globular Amphora Culture. Why finds from the older eastern Funnel Beaker Culture are absent from the lake region remains a mystery, as settlements from this epoch are well-known from the region, for instance, the 2.5 km distant type-site of Waltersdorf (Kirsch 1994, 97). The ongoing excavations at BBI have revealed new settlement areas belonging to the Waltersdorfer Group and Britzer Culture within a radius of 3–5 km to the east, west and southwest.

Ritual and burial complexes

Selchow

In sparing you the details of the above-mentioned new archaeological sites I would like, finally, to acquaint you with the most significant: the ritual and burial site of Selchow 24 (Köllner 2008). Here a minor topographic anomaly signified the remains of a north-south aligned unchambered long barrow with a trapezoidal enclosure adjoined to its northern end. (fig. 14.6). The complex contained 4 crouched inhumations and measured 54 m by 14 m. The shallow enclosure ditch was lined with postholes on its inside. Excavation of the southern area of the complex revealed three stone-covered crouched burials. The middle of this area was occupied by a centrally located pit packed with stones. Another crouched inhumation was situated at the northern extremity of the trapezoidal enclosure. A number of other possible cremation burials belong to this burial ground, as well as a pit with stone packing and three buried large ceramic vessels. The latter finds date to the late Funnel Beaker Culture and Globular Amphora Culture. The ceramic inventories of other pits date them to the older and late eastern Funnel Beaker Culture of the Waltersdorfer Group and Britzer Culture up to the outset of the Globular Amphora Culture.

Fig. 14.6: Aerial view at the unchambered long barrow of Selchow 24 with four crouched inhumations.



Approximately 300 m to the east of the barrow the settlement site of Selchow 10 belonging to the eastern Funnel Beaker Culture and the Globular Amphora Culture was excavated. On a typological basis the sites were almost certainly contemporaneous. The burial site of Selchow is the only known unchambered non-megalithic long barrow in Brandenburg. Similarities, however, exist with Kujawian sites in Poland that are dated to the Wiórek phase of the older eastern Funnel Beaker Culture.

Waltersdorf

The last recent discovery presented here is the Neolithic site Waltersdorf 26. This site lay to the east of the airport, its discovery being related to the new construction of the A 113 motorway.¹⁶ Apart from three Migration Period graves and an Early Bronze Age Necropolis with 16 burials a large settlement of the Late Bronze Age Lusatian Culture was excavated. Central to the Necropolis were 4 pits dated to the Globular Amphora Culture that were initially interpreted as inhumations (Govedarica 2002, 253 f.). Further investigation revealed the remains of the upper and lower jaws of two young cattle located in two distinct soil colourations. The position of the teeth allowed the reconstruction of two animal skulls pointing southwest, preserved only as somewhat darker soil colourations. Accompanying these were symmetrically ordered soil colourations in the northeast area of the pit fill which suggest the position of more compact bone material belonging to the pelvic girdle and femur. The soil colouration can be interpreted as the corpse shadow of a double cattle burial. Immediately behind the cattle a decorated Globular Amphora was found. The assemblage of an animal burial and two probably ritual pits without unequivocal evidence of human burial suggests that Waltersdorf 26 is a small ritual site of the Globular Amphora Culture. Similar Middle Neolithic ritual sites are to be found at Zachow No. 12 and Buchow-Karpzow No. 2 in the *Havelland* region, together with Falkenwalde No. 50 near Prenzlau in the *Uckermark* region.

Conclusion

This paper has been a discussion of selected aspects and the preliminary results of the large-scale archaeological project connected with the construction of Berlin Brandenburg International airport. The path to a realisation of the excavation campaign was indeed littered with organisational and administrative obstacles. Notwithstanding, Diepensee now has precedence status in the current legal framework that will ensure the future realisation of other large-scale projects within Brandenburg. Sites and monuments, both known and yet undiscovered, are now afforded statutory protection, securing and maintaining a high standard of archaeological fieldwork and publication.¹⁷

Notes

¹ Since december 2009, the official name is *Flughafen Berlin Brandenburg* or Berlin Brandenburg Airport, abbreviated BER. In addition, the airport will be named after *Willy Brandt*, former Chancellor of Germany and governing Mayor of Berlin.

² The *Brandenburg Denkmalschutzgesetz (BbDSchG)* became law in 1991. It was reformed in 2004.

³ The law concerning the *Umweltverträglichkeitsprüfung (UVPG)* dates from 1990 and was last modified in 2006. Its enactment in the Federal State of Brandenburg followed in 2002 with the "*Gesetz über die Prüfung von Umweltauswirkungen bei bestimmten Vorhaben, Plänen und Programmen im Land Brandenburg*" (BbgUVPG).

⁴ In 1995 the State of Brandenburg was involved in litigation against the Federal Republic of Germany concerning the financial burden of the mainline railway between Berlin and Hannover. Although the lawsuit was rejected on technical grounds, the High Court of Germany was instructed to arbitrate, and ruled that the financial burden of the recovery, documentation and safeguarding of threatened monuments applies only to those known, together with those whose existence is obvious and plausible. The general search for unknown monuments does not fall under the "polluter pays principle" and must be carried by the Heritage Authorities.

⁵ The archaeological survey was conducted by Thomas Hauptmann, Büro für archäologische Baugrunduntersuchungen, Bergfelde.

⁶ For a summary of the "Environmental Impact Assessment" (*Planfeststellungsbeschluss*) see: <http://www.mil.brandenburg.de/six-cms/detail.php/bb1.c.155589.de> (dec. 2011).

⁷ Trial trenching was carried out under the direction of Joachim Stark, M.A., BLDAM.

⁸ All the excavation team were temporarily employed by the Heritage Authority (BLDAM) for the duration of the campaign. The excavation was directed by Elisabeth Kirsch, M.A., Alexander Marx, M.A. and Joachim Stark, M.A. At this point I would again like to heartily thank the many colleagues whose commitment over the last 8 years has contributed to the success of the project.

⁹ Autodesk, AutoCAD; ArcTron, ArchäoCAD.

¹⁰ Kubit, PhoToPlan.

¹¹ The first results of investigation are published by Eickhoff & Stark 2006; Kirsch et al. 2006; Stark 2006a; Stark 2006b; Zwischenlandung 2006; Marx & Stark 2008.

¹² Report Dr. K.-U. Heußner, DAI Berlin, 3. 5. 2007, samples 12 and 13.

¹³ For first results about the church and the graveyard see: Marx 2007.

¹⁴ The anthropological investigation was undertaken by Dr. Bettina Jungklaus.

¹⁵ Also personal communication Dr. B. Schauer, München.

¹⁶ The excavation was carried out 2001 and 2002 by Prof. Dr. Blagoje Govedarica, BLDAM.

¹⁷ I would like to thank Verena Schwartz and Edward Collins, BLDAM, for the translation of the paper and the abridged version of the text.

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15 | Archäologie beim Bau der Nord-Süd Stadtbahn Köln

Marcus Trier

Zusammenfassung: Die archäologischen Ausgrabungen, die zwischen 2003 und 2011 anlässlich des Baus der Nord-Süd Stadtbahn Köln unternommen werden, sind der bislang größte Eingriff in den unterirdischen Denkmalbestand der Stadt. Dank der überwiegend unterirdischen Bauweise im Tunnelvortrieb beschränken sich die Erdeingriffe auf die zukünftigen unterirdischen Haltestellen, Versorgungs- und Anfahrsschächte der vier Kilometer langen Trasse. Zwischen den Haltestellen wird der anstehende Terrassenkies weit unterhalb der anthropogen beeinflussten Schichten im unterirdischen Tunnelvortrieb abgetragen. Die archäologischen Untersuchungsflächen umfassen insgesamt mehr als 30 000 m². Stellenweise erreichen die Schichten eine Mächtigkeit von über 13 m. Dies führt zu einem archäologischen Gesamtvolumen von ca. 150 000 m³.

Die Bedeutung und der Umfang der archäologischen Maßnahmen anlässlich des Baus der Nord-Süd Stadtbahn wurden vom Römisch-Germanischen Museum als zuständigem Fachamt für Bodendenkmalpflege frühzeitig erkannt. In den 1990er Jahren wurde der gesamte von der Baumaßnahme betroffene unterirdische Raum gemäß Denkmalschutzgesetz Nordrhein-Westfalen in die Liste der Bodendenkmäler der Stadt Köln eingetragen.

In den Jahren 2000 bis 2002 wurden Gutachten erarbeitet, in denen das archäologische, historische und topographische Wissen zu jeder Teilfläche zusammengefasst und mögliche Ergebnisse der Ausgrabungen prognostiziert sind. Auf der Grundlage dieser archäologischen Pflichtenbücher wurden Zeitfenster zwischen 4 und 18 Monaten und die Personalstärke der archäologischen Mannschaften auf den Untersuchungsflächen festgelegt.

Insgesamt kamen mehr als einhundert Archäologen, Bauhistoriker, Techniker, Zeichner und Grabungshelfer zum Einsatz. Gleichzeitig mit den Geländearbeiten wurden die anfallenden Funde aus den Ausgrabungen in einem parallel arbeitenden Innendienst gereinigt, beschriftet und bestimmt, um die insgesamt mehr als zwei Millionen Objekte mit den Ergebnissen der Ausgrabungen verknüpfen zu können. Die Ergebnisse der Untersuchungen werden in publikationsfähigen Abschlussberichten zusammengefasst.

Das Projekt

In den Jahren 2003 bis 2011 wurden im historischen Zentrum der Stadt Köln archäologische Ausgrabungen anlässlich des Baus der Nord-Süd Stadtbahn unternommen. Mit einer Investitionssumme von fast einer Milliarde Euro zählt die Erschließung der neuen U-Bahn, die den Kölner Süden mit dem Stadtzentrum verbinden wird, zu den kostenaufwendigsten Baumaßnahmen des öffentlichen Personennahverkehrs in einer deutschen Großstadt. Auch aus Sicht des Römisch-Germanischen Museums der Stadt Köln, das als Fachamt für Archäologische Bodendenkmalpflege und Untere Denkmalbehörde die Belange des Denkmalschutzgesetzes von Nordrhein-Westfalen für das Kölner Stadtgebiet hoheitlich wahrnimmt, sprengt das Projekt den Umfang aller bisherigen Ausgrabungen.

Die 4 km lange Trasse der Nord-Süd Stadtbahn tangiert alle wesentlichen historischen Entwicklungsphasen der Stadt, von der römischen Zeit bis in das 21. Jahrhundert. Die Erdeingriffe in die historisch gewachsenen Kulturschichten beschränken sich dank einer überwiegend unterirdischen Tunnelbauweise auf die künftigen unterirdischen Bahnhöfe, technische Bauwerke, Versorgungsschächte und umfangreiche Leitungsverlegungen. Zwischen den Haltestellen wird das anstehende Erdreich unterhalb der archäologisch relevanten

Schichten im unterirdischen Tunnelvortrieb mit großen Schildmaschinen von mehr als 7 m Durchmesser durchfräst. Unterirdische Verluste bei der archäologischen Dokumentation ergaben sich durch Gebäudesicherungen auf einem kurzen Streckenabschnitt innerhalb der ehemaligen römischen Hafensohle. In diesem Trassenabschnitt hätte der Tunnelvortrieb im instabilen Baugrund sonst zu unkalkulierbaren Setzungsschäden am oberirdischen Gebäudebestand geführt.

Die archäologischen Rettungsgrabungen auf 10 Untersuchungsflächen umfassen mehr als 30 000 m², dies entspricht der Fläche von 4 Fußballfeldern. Die historischen Schichten sind abschnittsweise mehr als 13 m mächtig. Daraus ergibt sich ein archäologisches Gesamtvolumen von 150 000 m³. Der Bau der Nord-Süd Stadtbahn ist damit der bislang umfangreichste Eingriff in die unterirdische Geschichte der Stadt Köln.

Pflichtenbücher

Das Römisch-Germanische Museum hat die archäologischen Herausforderungen im Zusammenhang mit dem Bau der Nord-Süd Stadtbahn frühzeitig erkannt. Um die archäologischen Rettungsgrabungen

im Projekt verankern und durchsetzen zu können, wurde der gesamte vom U-Bahn-Bau betroffene unterirdische Raum in den 1990er Jahren auf der Grundlage des Denkmalschutzgesetzes von Nordrhein-Westfalen in die Liste der Bodendenkmäler der Stadt Köln eingetragen. In zweijähriger Arbeit wurden im Römisch-Germanischen Museum ausführliche Berichte (Pflichtenbücher) erarbeitet, die das verfügbare archäologische, historische und topographische Wissen zu jeder Untersuchungsfläche zusammenführen und mögliche Ergebnisse der Ausgrabungen prognostizieren (Dietmar & Trier 2006; Trier 2003; Tempel & Trier 2005; Trier 2010).

Grundlage dieser Pflichtenbücher waren die Informationen im Ortsarchiv des Römisch-Germanischen Museums, in dem für den historischen Stadtkern annähernd dreitausend Fundberichte aus den letzten einhundert Jahren archiviert sind. Auch der digitale archäologische Schichtenatlas, der seit den 1990er Jahren mit finanziellen Mitteln des Ministeriums für Wirtschaft, Energie, Wohnen, Bauen und Verkehr Nordrhein-Westfalen finanziert wird, hat die Recherchen der Kölner Bodendenkmalpflege wesentlich erleichtert. Der von den Universitäten Köln und Dortmund in Zusammenarbeit mit dem Römisch-Germanischen Museum aufgebaute Schichtenatlas ermöglicht es, die historischen Stadtkataster von der römischen Zeit bis zum Vorkriegskataster aus den 1930er Jahren in den modernen Stadtgrundriss zu projizieren und die archäologische Prognose frühzeitig zu präzisieren (Häuber et al. 2004).

Ausschreibung und Vergabe

Auf der Grundlage der archäologischen Pflichtenbücher setzte das Römisch-Germanische Museum den Zeitbedarf je nach Größe und Anforderungsprofil der einzelnen Untersuchungsfläche auf 4 bis 18 Monate fest. Zugleich wurde die Zahl der archäologischen Mitarbeiter auf der Grabungsfläche, in der begleitenden Fundbearbeitung und in der Nacharbeit für den wissenschaftlich-technischen Grabungsbericht definiert.

Da die personellen Möglichkeiten des Römisch-Germanischen Museums zur Durchführung einer derart umfangreichen Rettungsgrabung bei Weitem nicht ausreichen, war es erforderlich, dass die Ausgrabungen von archäologischen Fachfirmen im Rahmen einer Kontraktarchäologie und unter der fachlichen Aufsicht des Römisch-Germanischen Museums unternommen werden. Die archäologischen Pflichtenbücher wurden in die Leistungsverzeichnisse der EU-weiten Bauausschreibung aufgenommen. Die Ausschreibung sah vor, dass die archäologischen Dienstleister als Subunternehmen der großen Bauarbeitsgemeinschaften tätig sind. Den von der Bauherrin (Kölner Verkehrsbetriebe AG) beauftragten Arbeitsgemeinschaften der Baulose Nord und Süd stehen darüber hinaus international renommierte archäologische Fachberater zur Seite.

Die Finanzierung der archäologischen Untersuchungen erfolgte auf der Grundlage des sogenannten Verursacherprinzips. Insgesamt dürften die Kosten der Ausgrabungen und Sicherungen von Bodendenkmälern circa 20 Millionen Euro erreichen; dies entspricht einem Anteil von circa 2 % der Gesamtbaukosten.

Fachaufsicht

Vor Beginn der Feldarbeiten haben die archäologischen Fachfirmen zusammen mit den Ingenieuren der Arbeitsgemeinschaften im Auftrag der Kölner Verkehrsbetriebe ein qualifiziertes wissenschaftliches und technisches Konzept zu jeder Untersuchungsfläche erarbeitet. Darin werden die archäologische Vorgehensweise, der Umfang naturwissenschaftlicher Begleituntersuchungen und die leitenden Wissenschaftler, Archäologen und Techniker vorgestellt. Das Konzept ist Teil der denkmalrechtlichen Anträge nach §§ 9 und 13 Denkmalschutzgesetz Nordrhein-Westfalen. Zuständig sind die Untere Denkmalbehörde im Römisch-Germanischen Museum und die Obere Denkmalbehörde beim Regierungspräsidenten Köln.

Zurückblickend bleibt festzuhalten, dass die Denkmalbehörden ihre Fachaufsicht ernst genommen haben. Mehr-

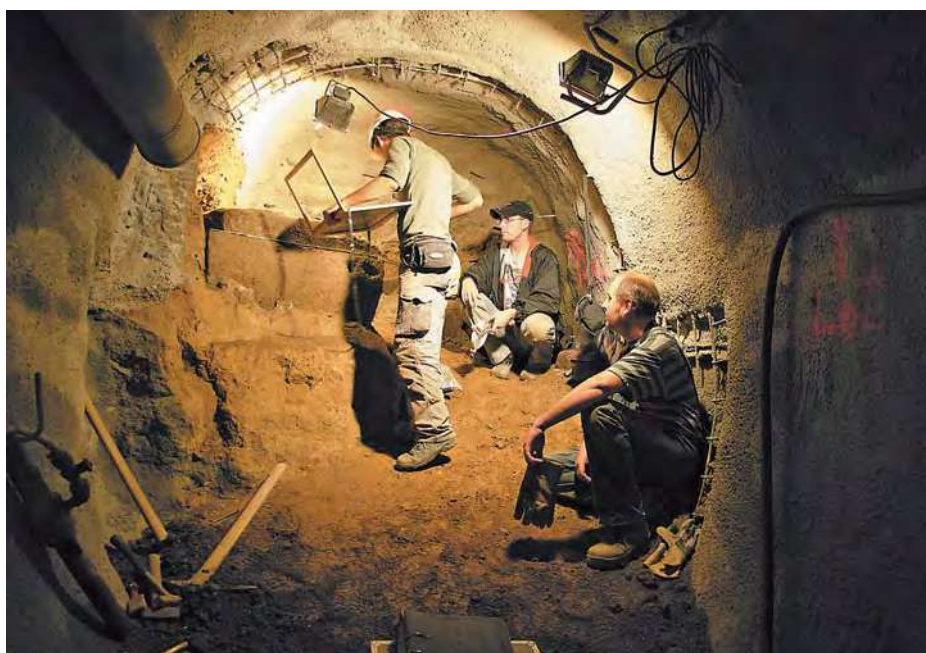


Abb. 15.1: Köln, Chlodwigplatz. Archäologen dokumentieren römische Bestattungen im unterirdischen Spritzbetonstollen 5 m unter der modernen Platzfläche.

Abb. 15.2: Köln, Kurt-Hackenberg-Platz. Bis 1945 war die heutige Platzfläche dicht bebaut. Unter freiem Himmel werden Fundamente, Kellermauern und Latrinen dokumentiert.



fach wurden Verstöße gegen denkmalrechtliche Auflagen mit Bußgeldern im drei- bis vierstelligen Rahmen geahndet. Grabungs- und Personalkonzepte wurden abgelehnt und zur Nachbesserung zurückgegeben.

Die fachliche Aufsicht über die laufenden archäologischen Ausgrabungen und die archäologische Projektsteuerung obliegen dem Römisch-Germanischen Museum. In wöchentlichen Baubesprechungen, an denen Vertreter aller am Projekt beteiligten Parteien teilnehmen, werden Ergebnisse der vorangegangenen Woche sowie aktuelle Fragen der Ausgrabungen erörtert und ein Ausblick auf die geplanten Aktivitäten der Folgewoche gegeben. Jeweils zu Beginn eines Folgemonats müssen die archäologischen Fachfirmen schriftliche Berichte vorlegen, in denen die wichtigsten archäologischen Ergebnisse des Vormonats schriftlich sowie in Planbeilagen und Fotografien erläutert werden.

Feldarbeit

Im Gelände waren zeitweise weit mehr als einhundert Archäologen, Grabungstechniker, Zeichner und Grabungshelfer tätig. Die Geländearbeiten waren eng verzahnt mit den Untersuchungen der beteiligten renommierten Naturwissenschaftler, allen voran die Labore für Dendrochronologie und Archäobotanik des Instituts für Ur- und Frühgeschichte der Universität Köln. Die Ausgrabungen erfolgen grundsätzlich vor Beginn der eigentlichen Baumaßnahme. Nur im Bereich von Leitungsumlegungen und -erneuerungen werden die archäologischen Dokumentationsarbeiten baubegleitend unternommen. Gerade im Zuge der Leitungsarbeiten ergeben sich oft unorthodoxe archäologische Arbeitsbedingungen, so zum Beispiel in unterirdischen Spritzbetonstollen (Abb. 15.1), die sich im Flözvortrieb durch den Untergrund arbeiten (Trier 2005). Überschneidungen mit dem Baubetrieb ergaben sich auch sonst: Die unterirdischen Bauwerke für die Hal-

testellen wurden durch bis zu 40 m tiefe Betonschlitzwände gesichert, die bis in die grundwasserundurchlässigen tertiären Sande reichen (Tertiärbaugruben). Um die Baugrube statisch zu sichern, wurden mit voranschreitender Arbeitstiefe für schweres Gerät Zwischenflächen geschaffen und die Baugrubenwände rückverankert.

Da alle archäologischen Untersuchungsflächen der Nord-Süd Stadtbahn im Straßenland der Kölner Innenstadt liegen, war es vielfach erforderlich, den Verkehr kleinräumig zu verlegen, um den Verkehrsfluss aufrechtzuerhalten, die Bauflächen freizustellen, Ausgrabungen und Baubetrieb zu ermöglichen. Die bis zu 5000 m² großen Untersuchungsflächen waren in zahlreiche kleinere Teilflächen zerstückelt. Die Geländedokumentation wurde hierdurch teils erheblich erschwert.

Nur für kurze Zeit wurde unter freiem Himmel und bei Tageslicht gegraben. Nachdem der sogenannte Voraushub eine Tiefe von circa 3 m erreicht hatte (Abb. 15.2), wurden Hilfsbrücken (Konstruktionen aus Stahl und Beton) über der Baugrube verlegt (Abb. 15.3). Über die Behelfsbrücken wurde der Verkehr umgeleitet. Die Ausgrabungen fanden in der Folge „unter Deckel“ unterirdisch im Licht von Jupiterlampen statt (Abb. 15.4). Trotz der Beton- und Stahldecken (Abb. 15.5) waren die archäologischen Arbeiten vor Wassereintrüben nicht geschützt. Probleme machten sowohl starke Niederschläge, die unkontrolliert in die Baugrube eindringen, als auch geplatzte Kanäle. Um den Zeitdruck aufzufangen, wurde phasenweise im Mehrschichtbetrieb gearbeitet (Abb. 15.6).

Da das Römisch-Germanische Museum vom Wert traditioneller Dokumentationsformen überzeugt ist, waren Feldzeichnungen mit Papier, Bleistift und Buntstiften und analoge Fotografien für alle beteiligten archäologischen Projektmitarbeiter verbindlich. Außerhalb der Vermessungsarbeiten war eine ausschließlich digitale Dokumentation unzulässig.



Abb. 15.3: Köln, Kurt-Hackenberg-Platz. Die archäologische Untersuchungsfläche wird mit Hilfsbrücken aus Stahlträgern und Betonplatten abgedeckt.



Abb. 15.4: Köln, Kurt-Hackenberg-Platz. Ausgrabungen unter Hilfsbrücken im Schein der Jupiterlampen.



Abb. 15.5: Köln, Kurt-Hackenberg-Platz. Große Teile der Ausgrabungen sind mit Hilfsbrücken überbaut. Die Baustellenlogistik wird über eine Andienöffnung in der Platzmitte gewährleistet.



Abb. 15.6: Köln, Severinstraße. Im nächtlichen Scheinwerferlicht arbeiten Archäologen mit Hochdruck an den steinernen Fundamenten der hochmittelalterlichen Deutschordenskirche St. Katharina.

Innendienst und Aufarbeitung

Parallel zur Geländearbeit werden die Funde im Innendienst gereinigt, wissenschaftlich bestimmt, in Datenbanken eingegeben und nach den Vorgaben des Römisch-Germanischen Museums magazinfähig verpackt. Die Geländezeichnungen werden digital erfasst. Nach Abschluss der Geländearbeiten werden nach dem Vorbild der Ausgrabungen auf dem Kölner Heumarkt (Heumarkt I–III) publikationsfähige wissenschaftliche und technische Berichte vorgelegt, in denen die Ergebnisse der Ausgrabungen beschrieben und erörtert werden. Ziel ist es, auch die Ergebnisse der U-Bahn-Untersuchungen zeitnah in den Kölner Jahrbüchern zu veröffentlichen und so die Ergebnisse der Ausgrabungen der Öffentlichkeit und der Fachwelt bekannt zu machen. Erste Manuskripte sind erschienen, so eine Untersuchung von Ulrike Ehmig zu mehr als 300 römischen Amphorenbruchstücken mit Pinselaufschriften (Berthold & Trier 2006; Ehmig 2007). Die Aufarbeitung der archäologischen Ausgrabungen dürfte noch bis zu 15 Jahre in Anspruch nehmen.

Öffentlichkeitsarbeit

Wegen der Arbeit unter Hilfsbrücken entziehen sich die archäologischen Arbeiten weitgehend den Augen der interessierten Öffentlichkeit. Großer Wert wurde daher auf die Medienarbeit gelegt, die, soweit es die Archäologie angeht, in den Händen des Römisch-Germanischen Museums lag. Die Pflichtenhefte fanden in wesentlichen Teilen Eingang in das Buch „Mit der U-Bahn in die Römerzeit“ (Dietmar & Trier 2006). Weit mehr als zweihundert Berichte in lokalen, regionalen und internationalen Zeitungen und Zeitschriften sowie Beiträge für Rundfunk und Fernsehen berichteten bislang über die laufenden Ausgrabungen. Die Bauherrin widmet der Archäologie auf ihrer Internetseite www.nord-sued-stadtbahn.de ein eigenes Kapitel. In mehrere Projektbroschüren sind archäologische Kommentare eingeflossen, ein Heft befasst sich aus-

schließlich mit den Ergebnissen der Archäologie (Trier & Wirdeier 2005).

In der Bechergasse wurde unmittelbar neben dem Informations- und Bürgerbüro der Kölner Verkehrsbetriebe ein Ausstellungsraum mit aktuellen Funden der U-Bahn-Archäologie eingerichtet. Im Römisch-Germanischen Museum der Stadt Köln wurde die Ausstellung „Unterweltbilder“ mit Fotografien zur U-Bahn-Archäologie mit Erfolg gezeigt. Die Landesausstellung zur Bodendenkmalpflege in Nordrhein-Westfalen, die bereits 2005 erste Funde der Öffentlichkeit bekannt machte, hat das Thema 2010 erneut aufgegriffen. Unter dem Titel „10 Jahre U-Bahn-Archäologie in Köln“ ist für 2012/13 eine weitere, umfassende Ausstellung im Römisch-Germanischen Museum geplant.

Ein Fallbeispiel: Kurt-Hackenberg-Platz, römische Stadtmauer mit Hafentor

Die Ausgrabungen auf dem Kurt-Hackenberg-Platz, unmittelbar östlich des Römisch-Germanischen Museums in der nördlichen Kölner Altstadt gelegen, sollen die Maßnahme beispielhaft beleuchten. Der Platz, ein Ergebnis des Wiederaufbaus nach dem Zweiten Weltkrieg, liegt über einer alten Rinne des Rheins, in der im 1. und 2. Jahrhundert n. Chr. der Hafen der römischen Stadt lag. Am Hangfuß zum hochwassersicheren Stadtplateau wurde am Ende des 1. Jahrhunderts n. Chr. die östliche römische Stadtmauer errichtet. Sie quert die Baugrube auf 25 m Länge in Nord-Süd-Richtung (Abb. 15.7). Über einem 3 m breiten Sockel erhebt sich das aufgehende 2,4 m mächtige Mauerwerk mit Schmalmauern aus sorgfältig behauenen Grauwackehandquadern und Gusskern (*opus caementitium*). Der Verlauf der römischen Stadtmauer war durch Altgrabungen bekannt, eine Verlegung der Trasse jedoch nicht möglich, da genau an dieser Stelle die neue Tunnelröhre auf das seit den 1960er Jahren bestehende Schienennetz trifft. Der archäologische Befund, der in der Baugrube 2007 dokumentiert wurde, ergab einige Überraschungen



Abb. 15.7: Köln, Kurt-Hackenberg-Platz, die Baugrube südöstlich des Domes und des Römisch-Germanischen Museums. Die rote Linie markiert den Verlauf der römischen Stadtmauer.



Abb. 15.8: Köln, Kurt-Hackenberg-Platz. Bei den Ausgrabungen wird ein Teilstück der rheinseitigen römischen Stadtmauer mit vermauerter Toröffnung und Kanalauslass freigelegt, Ansicht von Südosten.

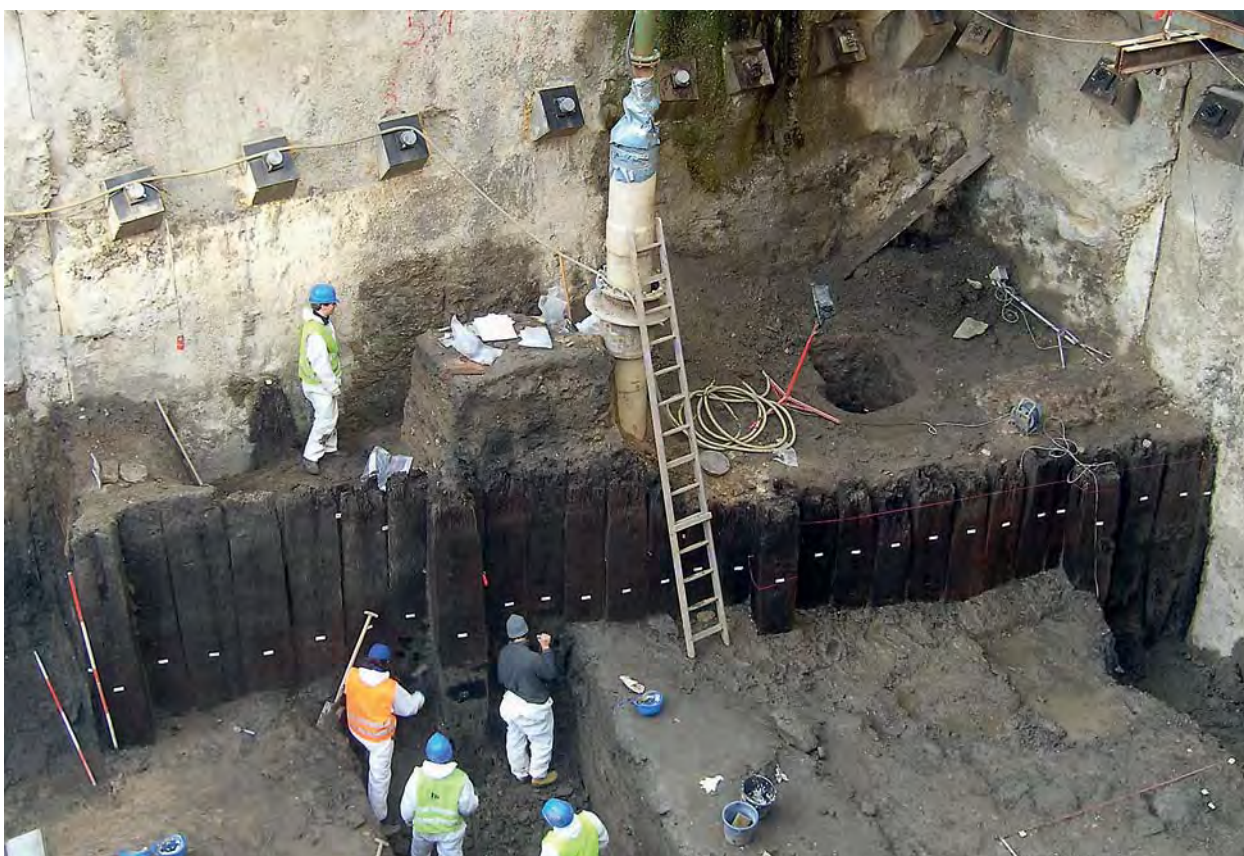


Abb. 15.9: Köln, Kurt-Hackenberg-Platz. Römische Kaimauer aus mächtigen Eichenbohlen, dendrodatiert 90/91 n. Chr., Ansicht von Osten.

Abb. 15.10: Köln, Kurt-Hackenberg-Platz. Das römische Hafentor, im 4. Jh. mit wiederverwendeten Werksteinen vermauert. Unter Kalk-, Tuff- und Sandsteinblöcken erkennt man das regelmäßige Schalmauerwerk des 1. Jhs. n. Chr. aus Grauwackehandquadern.



(Abb. 15.8): Das 6,5 m 7,4 m große Torhaus der römischen Stadtmauer ragt nicht wie erwartet nach Osten in das Hafenbecken vor, sondern nach Westen zur Stadtinnenseite. Die 1893 erstmals freigelegten großen Kalksteinquader gehören stattdessen zu einem großen Abwasserkanal, der in die römische Stadtmauer eingelassen ist und in das Hafenbecken mündete. Ein 16 m langer Abschnitt dieses Kanals wurde 1978 bei Bauarbeiten freigelegt. Ein Teilstück ist heute neben der mit Basalten gepflasterten römischen Hafenstraße aufgebaut. Das Torhaus besitzt eine 2,7 m breite Toröffnung mit großen Sandsteinblöcken als Torgewänden. Zum Hafen öffnete es sich über dem 2 m hohen, mit großen Tuffsteinquadern abgedeckten Auslass des Abwassersammlers. Unmittelbar vor der Stadtmauer verlief in 4 m Abstand eine Spundwand aus sorgfältig gebeilten, rechteckigen Eichenhölzern (Abb. 15.9). In den Grundwasser führenden Erdschichten haben sich die römischen Hölzer sehr gut erhalten. Dendrochronologische Untersuchungen der Universität Köln (B. Schmidt) datieren den Bau der Kai-mauer in die Jahre 90/91 n. Chr. (Schmidt 2010).

Der Hafenrinne war nur eine kurze Nutzungsdauer beschieden. Zu Beginn des 2. Jahrhunderts n. Chr. änderten sich die Strömungsverhältnisse im Hafen. Aus der durchflossenen Rinne wurde ein nach Norden offener Altarm. Im Hafenbecken sammelten sich Sande und illegal verkippter Abfall. Auf der Hafensohle wurden mehrere hunderttausend Tierknochen, Austernschalen und Bruchstücke von zerbrochenen Keramikgefä-

ßen geborgen. Pinselaufschriften (*tituli picti*) auf mehr als 200 Amphorenfragmenten zeigen, dass die Transportbehälter aus ihren Ursprungsregionen in Italien, Spanien, Frankreich und Zypern nach Köln importiert wurden (Ehmig 2007).

Abb. 15.11: Köln, Kurt-Hackenberg-Platz. Zur dauerhaften Sicherung der römischen Stadtmauer wurden zunächst Stahlträger verankert, anschließend das Fundament gesägt. Der neue U-Bahn-Tunnel wird künftig unter der Stadtmauer verlaufen.



In weniger als 50 Jahren bildeten sich über 4 m mächtige Ablagerungen. Holzfunde zeigen an, dass das alte Hafenbecken in den Jahren 148/149 n. Chr. vollständig aufgefüllt war. Der Hafen wurde auf das Ostufer der ehemaligen Rheininsel an den offenen Strom verlegt. Im 4. Jahrhundert n. Chr. war die Insel längst landfest an das Stadtgebiet angebunden. Die römische Provinz Niedergermanien und ihre Hauptstadt Köln waren zunehmend den germanischen Übergriffen auf römischen Boden ausgesetzt. Das Hafentor gibt Zeugnis von dieser Krise des Reiches, denn es wurde vermutlich anlässlich der fränkischen Überfälle in den Jahren 355/56 n. Chr. mit wiederverwendeten Werksteinen zugemauert. Hierfür nutzte man unter anderem Architekturteile wie Säulenfragmente, ältere Grab- und Weibesteine (Abb. 15.10).

Nachdem deutlich war, wie gut dieses Denkmalensemble erhalten war, wurden sofortige Verhandlungen zur dauerhaften Sicherung dieses bedeutenden Befundes eingeleitet. Mit einer ingenieurtechnischen Meisterleistung ist es gelungen, große Teile des Denkmals zu erhalten (Abb. 15.11). Es soll in den nächsten Jahren dauerhaft öffentlich zugänglich gemacht werden. Nach Abschluss der Bauarbeiten für die Nord-Süd Stadtbahn wird man über einen Treppenzugang auf dem Kurt-Hackenberg-Platz in einen unterirdischen Besucherraum hinabsteigen können.

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Bildnachweis

1, 6, 8: Eusebius Wirdeier, DGPh, Köln. – 2–5, 9–11: Römisch-Germanisches Museum der Stadt Köln/Marcus Trier. – 7: Römisch-Germanisches Museum der Stadt Köln/Peter Otten und Elisabeth M. Spiegel.

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Additional conference contributions (summaries)

Seeing the bigger picture: large-scale excavations and landscape archaeology in England and beyond

Roger M. Thomas

The Valletta Convention and the European Union Environmental Impact Directives have resulted in extremely large-scale open-area excavations being undertaken in many parts of Europe. Much of this work has been linked to infrastructure development (such as motorways, railways, airports and pipelines) or to large-scale mineral extraction.

The results of archaeological work on this unprecedented scale have the ability to transform our perceptions of the archaeological record, of the archaeological landscape, and of past societies. Such work can give us a 'new view' on the results of older, smaller excavations, enabling us to see the whole rather than just small parts. It can show us some of the things that were happening *between* the main 'sites' which have been the traditional focus of excavations. We can also start to extrapolate from the results of large-scale excavations to the landscape as a whole: if we excavate (say) 100 hectares, what do the results tell us about the rest of the landscape which we haven't excavated?

Thus, our large-scale open-area excavations give us a great opportunity to start thinking in new ways about the archaeological landscape as a whole.

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Palaeo-landscapes at Heathrow and Stansted Airports

Gill Andrews and John Lewis

Recent development at both Heathrow and Stansted Airports has involved the archaeological investigation of substantial tracts of land, 100 hectares at the former site and 230 hectares at the latter. Both programmes of work have been carried out by Framework Archaeology and both have been for the same client, BAA plc. This has given the opportunity to implement consistent methodological and academic approaches in landscapes which are some distance from one another and topographically of a very different character, although both are in southern Britain.

At Stansted extensive survey work has been undertaken to inform an application for permission to build a second runway. Information from excavations previously carried out in the area of the airport was used to construct a preliminary model of the historical development of the landscape at a sub-regional scale. Field survey, including field walking and trial trenching, was used to assess the model which was updated and refined with the new data. This updated model has been used to predict the likely nature of deposits which might be encountered during the proposed development and has informed the design of mitigation strategies.

At Heathrow excavations undertaken over a period of more than 10 years in advance of the development of Terminal 5 have revolutionised understanding of the landscape history of the area. In contrast to Stansted, knowledge from previous excavations was very limited. The model of landscape development gained as a result of the development is allowing data from previous archaeological investigations, much of which is scattered and small-scale, to be re-assessed and interpreted anew.

Both projects have benefited from the use of a GIS application which allows a seamless approach to data capture, analysis and dissemination. Data can be integrated with other digital data sets, facilitating research at an intra-site and wider level. The digital data from both Heathrow and Stansted have been distributed on disc and are being made available through the Web, in an effort to promote collaborative research and regional level analysis.

Adopting the same approach to the data capture and analysis of the material from the sites at Heathrow and Stansted has also enabled comparison at an intra-regional level. It is clear that the landscape development of these two areas was very different and this has prompted new lines of enquiry and research.

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Opérations archéologiques dans la région entre Paris et Meaux. Archéologie préventive, démarches méthodologiques et résultats majeurs

Paul van Ossel

Une part de plus en plus importante de la recherche archéologique réalisée aujourd'hui en France l'est désormais dans le cadre de l'action préventive ou de sauvetage. Cette situation, que l'on retrouve aussi ailleurs en Europe, n'est pas sans conséquences sur la recherche archéologique dans son ensemble. Elle entraîne des contraintes importantes qui pèsent sur les opérations et qui sont souvent mal vécues par les équipes travaillant sur le terrain. Enchaînements rapides des opérations, corsetage des délais de fouilles limitant d'autant la qualité des interventions, manque de moyens pour approfondir les recherches et, plus généralement, manque de temps pour réfléchir aux résultats acquis et pour préparer les nécessaires publications, sont quelques-uns des reproches le plus fréquemment adressés aux opérations préventives. Dans ces critiques réside sans doute une des faiblesses majeures de la recherche archéologique actuelle en France, où la séparation de plus en plus grande entre l'archéologie programmée et l'archéologie préventive conduit à une situation de conflit permanent, difficilement tenable à long terme. Cette situation n'est pourtant pas une fatalité et il paraît au contraire possible de mettre à profit les avantages et les acquis incontestables de l'archéologie préventive pour renouer les liens entre les différentes pratiques de l'archéologie et pour développer de nouvelles formes de recherche.

Le programme présenté dans cette communication est un exemple – parmi d’autres – de la manière dont des solutions ont pu être trouvées pour pallier les difficultés évoquées ci-dessus. Au départ, il y avait le projet d’étude diachronique d’un terroir (la Plaine de France), avec une attention toute particulière accordée à l’Antiquité. L’originalité du programme mis en place il y a maintenant une dizaine d’années tient dans la volonté d’intégrer un nombre aussi grand que possible d’opérations variées (fouilles préventives, prospections, travaux universitaires ...) dans un projet scientifique à longue durée et à grande échelle, dépassant les limites étroites des emprises de chaque fouille individuelle, de manière à s’intéresser effectivement à un terroir bien défini dont on savait qu’il allait faire l’objet à court terme d’une urbanisation dévorante et, donc, de nombreuses opérations archéologiques. Pendant cinq années, entre 1997 et 2003, plusieurs opérations préventives, dont les principales furent celles menées autour de l’extension de l’aéroport « Roissy – Charles de Gaulle » (près de 300 ha explorés) et de la construction du TGV-Est dans son parcours francilien, auxquelles s’ajoutèrent des fouilles conduites sur divers aménagements routiers et industriels, ont concouru directement à la réalisation de ce programme. À ces travaux de fouille s’ajoutent les prospections de surface répétitives réalisées depuis une trentaine d’années par une association régionale (la JPGF) sur l’ensemble de la Plaine de France, dont les résultats sont toujours en cours d’étude. Plusieurs travaux universitaires et des recherches spécifiques poursuivent de leur côté l’exploitation de l’énorme masse documentaire rassemblée à ce jour. Les premiers résultats, dont certains ont déjà été présentés, débouchent sur des perspectives nouvelles concernant non seulement la nature de l’occupation de ce terroir partagé à part à peu près égales entre les cités antiques des Meldes et des Parisii, mais aussi son développement et son importance dans l’économie provinciale.

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Wide-ranging excavations of the Stone Age settlement structures in south-western Poland: recent approaches and results

J. M. Burdukiewicz and M. Furmanek

Wide-ranging excavations of the Stone Age settlement structures in south-western Poland started in the early 1990s because of the fast modernisation of Poland after the collapse of communism in 1989. Since this period, new road constructions on a large scale have begun as well as other huge development projects. The most fruitful were the preventive excavations on motorway A4 (E40) from Zgorzelec to Katowice and on the ring road of Wrocław city. For archaeologists it was the time when logistics and scientific work concerning large-scale building operations were entrusted to a new institution called the National Heritage Board of Poland (NHBP). This institution involved a concept of preventive excavation and archaeological documentation as well as examination of final results. In south-western Poland preventive archaeological research was done by the Institute of Archaeology

and Ethnology of the Polish Academy of Sciences in cooperation with the Institute of Archaeology of the University of Wrocław and several private archaeological enterprises.

During the last 15 years the excavated surface of Stone Age sites grew up to over 90 % in south-western Poland. Several new sites were discovered, which were completely excavated, bringing immense data about density and dynamics of settlement structures as well as several new discoveries concerning economic and symbolic subjects. The most interesting are new Palaeolithic sites from Lower Silesia. The first one is the Magdalenian settlement Wrocław-Zerniki 25 – a concentration of 4000 lithic artefacts and 60 stone slabs. Another spectacular site is Nowa Wies 2 near Bolesławiec – two poor lithic concentrations belonging to the *Federmesser* technocomplex with a concentration of amber lumps in various stages of processing, possibly the oldest known amber workshop. Other unearthed settlement structures from Sleza 12 near Wrocław revealed Late Palaeolithic concentrations of well refitted artefacts. The most representative contexts for the Mesolithic are the newly discovered lithic concentrations from Krepnica near Bolesławiec and Wrocław-Widawa.

The Neolithic period has become much better known during the last 15 years than during the previous century. Most remarkable are the discoveries of several new sites representing various phases of the Neolithic, which show a much higher cultural and economic diversity than was formerly known. Rich Neolithic settlements of the Linear Pottery culture were discovered, like Kostomłoty or the settlement and burial mound at Sleza 10, as well as numerous sites of the Funnel Beaker culture or, less known in Silesia, the Globular Amphora culture or Paraneolithic hunter-gatherers.

Another advantage of wide-ranging excavations is their interdisciplinary character. Numerous natural science methods focusing on palaeoecological setting and post-depositional site formation processes are applied. The new equipment, like total and smart stations, allows fast 3D recording of data and spatial analysis. Analytical geochemical and spectrographic methods enable much more extensive research on natural resources used by prehistoric societies.

Much broader application of radiocarbon dating and richer artefact assemblages give an opportunity to specify the chronology of the Stone Age in south-western Poland in Central European context.

NHBP demands detailed research reports which are transferred into a general archaeological computer data base called e-Archeo. More important sites are discussed in several local or international conferences, and a number of periodicals or special volumes devoted to preventive excavations are being published.

The weakest part of the recent wide-ranging excavations is the participation of private archaeological companies, which are not interested in detailed analysis and in the publication of their research results.

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Heritage management strategies concerning the large-scale destruction in the lignite mining region of the Rhineland

Udo Geilenbrügge

In the fertile loess plains between Cologne and Aachen about 360 ha of cultural landscape are annually destroyed by opencast lignite mining. Each of the three large mines has an operational size of up to 85 km². The necessary archaeological measures are carried out by a specialized branch office of the Rhineland Commission for Historical Sites before the destruction starts. The permanent staff of 32 persons, including 4 archaeologists and 6 field archaeologists, can be extended by up to 9 students in the vacation periods. It is possible to employ extra staff for a limited time for special projects. This arises from the support of the foundation „Archaeology in the Rhenish lignite region“, which was started in 1990 through the mining company RWE-Power AG, the Land of North-Rhine Westphalia and the Rhineland Regional Council (LVR). The current trust capital is about 16 million Euros, which through an annual interest return of around 300 000 Euros creates good opportunities for extra projects. Further assistance is also given by the mining company: no claims to any artifacts found and the provision of technical machinery with personnel. Despite these positive parameters, still only around 5 % of the area annually destroyed by mining can be investigated by excavation. The vast dimensions of the opencast mines make a careful preparation essential. Intensive prospecting is carried out in the winter months. In recent times the use of modern geophysical methods has steadily grown in importance. For the excavations it is important to consider the special chances for the threatened areas. Without doubt a big advantage is naturally the free and open choice of sites for excavation, although this privilege is limited to a small strip directly on the active edge of the coal mine, and hence leads to great pressure of stress and workloads. In an ideal case this can result in the complete excavation of a particular site. This occurred for instance in the exceptional excavations of Linear Pottery culture settlements of the Aldenhoven Plateau in the 1960s and 1970s. Also within the scheme of landscape investigations for specific periods during the last decades, the analysis of Roman *villae rusticae* sites in the Hambach mining area has taken place. Recently in the same style the settlements of the Bronze and Iron Ages were specially investigated. Linear projects such as the successive excavations along the major Roman route from Cologne to Boulogne-sur-Mer or even the complete stretch of the Elsbach valley for a length of about 2 km are possible. Further special projects are only possible due to the mining conditions: for example the excavation of more than 100 Roman wells up to a depth of 28 m, or deep trenching to uncover palaeolithic find layers, or even village settlement investigations including the excavation of complete church areas. The necessary co-operation with natural scientists can be increased, so that apart from the normal assistance, large-scale trenching, specific geological or palaeobotanical research aims can be targeted. The result is an even better understanding of the ancient landscape.

It is no surprise that the excavations provide popular themes for university research with annual results of about 3 studies published. An added bonus for students is the generous funding provided by the Archaeological Foundation. With only a few exceptions the project-evaluation problems have been successfully reduced. The good state of research also allows further investigations to take place such as archaeoprogno-sis – archaeological risk assessment – or even detailed censuses of local ancient populations and economic processes. Despite all the research interests, it is important not to neglect the public relations and awareness, in order to resist successfully any demands for financial and/or personnel cutbacks.

The lignite mining industry causes without doubt a radical loss in the ancient cultural landscape. Still an intelligent excavation strategy can lead to several positive gains in archaeological knowledge.

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