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Recovering Lost Landscapes – introduction to an aerial perspective

The scale of landscape transformation over the last century, within Europe and globally, has been great. War, urban expansion, land use and land cover change and construction projects, amongst other activities and processes, have heavily altered our landscapes, destroying or covering up ancient monuments and the historic environment. The resulting loss of evidence from which to understand the past has been great, and sources that give us an insight into earlier conditions can be invaluable. So-called ‘historic’ aerial imagery is a privileged source for documenting and understanding these lost landscapes since it provides information that cannot be found anywhere else. To the historic aerial perspective can be added complementary sources such as historic cartography, modern aerial photographs and new technology such as Airborne Laser Scanning, recognizing that integrated approaches are key to more comprehensive interpretations of landscape processes.

The uses of historic aerial photographs, amongst a range of available sources, to better understand and manage dynamic landscapes are at the heart of this volume, with a particular focus on areas that have undergone dramatic change over the last century. Case studies from across Europe present varying approaches to interpretation drawing on current practice from a range of different landscapes. Technical challenges are also discussed, for example in extracting 3D topographical data from historic aerial imagery or integrating multiple sources of information, and pointers to future directions. Here, the synergies of ‘old’ data and new technology with the rapid developments in soft-bench photogrammetry open up new avenues for integrated cross-disciplinary landscape investigation. Such interdisciplinarity is also reflected in the archaeological, geographical and historical perspectives that authors draw into discussions that extend to social context, ideology, political frameworks and perception. This recognises the contingent nature of landscape understanding, and the interwoven dynamics of landscape form, past and present perception and our own engagement.

While multiple sources of information and perspectives are represented in this volume, the unique insights that historic aerial photographs and the aerial perspective can give is a consistent theme throughout. Thus, it will be no surprise that varying accessibility and availability of imagery is touched on by many authors. The application of an aerial perspective can vary between countries depending on intellectual or academic traditions, but the availability of imagery and ease of access to archives to a large degree define whether or not these underused sources of knowledge can be utilised effectively.

THE ORIGINS OF THIS VOLUME

This volume has emerged from discussions between those using historic aerial photographs and other means of archaeological prospection in landscape studies, drawing on pan-European perspectives presented at two meetings held within the framework of the ‘ArchaeoLandscapes Europe’ project. The first event was a seminar and workshop on *Recovering Lost Landscapes* that dealt with the applications of historic aerial images. This was organised by the Institute of Archaeology in Belgrade and the Research Centre of the Slovenian Academy of Sciences and Arts (ZRC SAZU) in Ljubljana, and held in Belgrade on 19th/20th November 2013. The second meeting was a conference on *Patterns, Processes & Understanding: historic aerial photographs for landscape studies* organised by the Institute of Prehistory of the Adam Mickiewicz University in Poznań,

the Department of Archaeology of the University of Szczecin and RCAHMS, with the support of the Remote Sensing & Photogrammetry Society (RSP-Soc) and the Aerial Archaeology Research Group (AARG). This was held in Będlewo near Poznań between the 24th and 26th of April 2014.

The origins of this volume in trans-national collaboration will be evident from the listing of the organisers of the events above, working together in the framework of the European Union Culture 2007–2013 funded ArchaeoLandscapes Europe (ArcLand) project (<http://www.arcland.eu/>). A central objective of ArcLand is the exchange of knowledge and skills across Europe, and it is this funding and other support that has made it possible for the editors to develop this volume. Reflecting its genuinely international origins, editorial meetings have been held in Dublin and Frankfurt, with the editing done in Belgrade, Ljubljana, Edinburgh and Szczecin. The support of ArcLand has been vital to the success of this volume, and the editors are especially grateful to its project manager, Axel Posluschny of the Roman-Germanic Commission, Frankfurt am Main, for his support.



Figure 1. *Belgrade Conference: Gianluca Cantoro's presentation.*

THE STRUCTURE OF THIS VOLUME

The contributions to this volume present various archaeological and methodological perspectives from across Europe that deal with a broad chronological span from prehistory to the very recent past. Inevitably, many of the papers are cross-cutting in nature, and we encourage the reader to keep in mind the framework of integrated landscape investigation that we aspire to. The contents and structure of the volume are described below, not to précis the papers, but to try to sketch out some central themes, already mentioned in passing above, that recur across different landscapes. Five of these themes reflect the structure and running order of the chapters, but we begin with the recurrent theme of availability of aerial imagery.

Using archives

Throughout this volume, and earlier publications on applications of historic aerial imagery (e.g. Cowley et al. 2010; Comer and Harrower 2013; Hanson and Oltean 2013), access to archives and the selection of appropriate imagery for a variety of purposes are common concerns. In Chapter 2 Rog Palmer presents his experience working at different archives in England, reflecting on the tensions between his interest in the aerial photographs as sources of information and knowledge and that of the archive that may prioritise preservation or commercial gain over ease of access. Similar themes, and the problems of finding imagery that is fit for particular purposes, are discussed in case studies from Spain (Chapters 6 and 11), Poland (Chapter 12), Montenegro (Chapter 14) and again England (Chapter 15). The problems are not just with access (e.g. to military archives), but also concern uneven metadata that might help in locating the most suitable images for the purpose at hand, though other problems, such as the technical challenges of working with older imagery that lacks calibration data are being overcome by technical developments (e.g. Chapters 6, 7 and 9).

Landscape change

The often wholesale transformations of landscape that are a hallmark of the 20th century in many parts of Europe have resulted in massive losses to parts of the historic environment, even over the last few decades as even a cursory examination of the Corine land cover inventory (<http://www.eea.europa.eu/data-and-maps/data/corine-land-cover>) shows. Consistently through this volume, authors refer to historic aerial photographs to see what may have been lost, and in Chapter 2 (*Why are historical aerial photographs categorised as something special?*) Rog Palmer examines how aerial photographs allow us to see patterns and processes and to understand these, and how we reach a level of understanding of past landscapes. This paper highlights how

important is knowledge of contemporary and recent land use and a fuller understanding of the landscape context of the past we seek, issues that are also discussed in case studies from Poland (Chapters 3, 4 and 5), Serbia (Chapter 6), Spain (Chapters 7 and 12) and Slovenia (Chapter 14).

Perceptions of landscape and interdisciplinarity

Landscapes are the product of many processes, not least amongst which are the perceptions and perspectives of inhabitants and observers, past and present. The common desire to objectify elements of our surroundings, through description, classification or devices such as mapping is at the core of Chapter 3 (*Why are maps often misleading about archaeological sites?*) in which Grzegorz Kierszys examines the ideological context for the recording of earthworks on large-scale topographical maps in the Lower Silesia Region, western Poland. This illustrates the degree to which the cartographic depiction of monuments in this area is influenced by political and social transformations, and by pre-understanding and varying perceptions of cultural heritage sites.

The changing perceptions of inhabitants in a rural landscape are explored by Dawid Soszyński, Cyprian Jaruga and Barbara Sowińska-Świerkosz in Chapter 4 (*A river in a rural public space in the early 1940s: a case study of the Bug river valley (East Poland)*). The role of the Bug river and the definition and functioning of public spaces is set in a historical context from the late 1930s, and, in a contribution that emphasises the social dimension of landscape, aerial photographic and cartographic analyses are compared with information from interviews with residents, especially the oldest people who have lived in the area since the 1940s.

Staying in Poland, in Chapter 5 (*Recovering the lost landscapes of abandoned villages in the Sudetes Mountains, southwest Poland*) Agnieszka Latocha examines an area characterised by widespread depopulation and the extensive survival of ruinous settlement and land use remains. The exploration of the methodological issues of investigating such relict places provides a foundation for discussion of the human impact on the landscape and the persistence of the traces of the past.

Exploring landscapes – case studies

The papers collected as case studies of landscape exploration begin with Chapter 6 (*Landscape Reconstruction in the Middle Danube Roman Limes*) in which Vujadin Ivanišević and Ivan Bugarski use a variety of sources to study an area on the Danube inundated by the construction of a dam. Eighteenth century and later maps, topographic data and aerial photographs are used to understand the flooded area and to provide landscape context for excavated sites otherwise isolated from their environment. In Chapter 7 (*Ancient Landscapes of north-western Iberia: historical aerial photographs and the interpretation of Iron Age and Roman territories*) Brais Currás, María Ruiz del Árbol, Francisco Javier Sánchez-Palencia, Almudena Orejas, and Damián Romero present the use of archive aerial imagery in a diachronic study of social and territorial changes during late pre-history and the Roman period in part of present-day Spain. Turning to Wales, in Chapter 8 (*Recovering Lost Landscapes in Wales*) Chris Musson and Toby Driver discuss the results of three decades of aerial reconnaissance for primary discovery of archaeological sites and for documenting changing landscapes throughout the country. Working in a country with a rather different archaeological tradition, where no attention has been paid in the past to the interpretation of historical or archaeological landscapes, in Chapter 9 (*Aerial Photography and Remote Sensing on the Karst: a case study of Boka Kotorska Bay, Montenegro*) Miloš Petričević presents preliminary results of a pioneering use of aerial photographic and remote sensing data in Montenegro.

Heritage Management

The creation of reliable knowledge about the past to support effective heritage management is a central objective of much archaeological work, and the two papers grouped together here are not the only ones to address heritage management. In Chapter 10 (*Recovering Lost or Hidden Landscapes – Aerial Photographs and the English National Heritage Protection Plan*) Helen Winton reports on the extensive and systematic work in England to compile landscape-scaled information to support the discovery, analysis and protection of landscapes. Developing similar themes, in Chapter 11 (*Historic aerial photographs in the analysis of cultural landscape – case studies from Poland*) Rafał Zapłata and Sebastian Różycki discuss the acquisition of archival resources, the quality of historical aerial photographs, including their spatial resolution, and their cultural heritage potential in site identification, inventorisation and monitoring change and damage.

Technical challenges and developments

The four papers in this section include case studies from Spain, Poland and Slovenia, but are grouped here for their contribution to developing technical solutions to problems of working with historic and contemporary imagery. This is a rapidly changing field, which is benefiting from developments in software and processing power, and in Chapter 12 (*Aerial Photogrammetry: when Archaeology meets SIFT*) Gianluca Cantoro provides general information about digital photogrammetry and shares his experiences with free and affordable software. In Chapter 12 (*Historical aerial photographs to recover a lost landscape using digital photogrammetry: a case study of the Iron Age site of Cerro de la Mesa (Alcolea de Tajo, Toledo, central Spain)*) Cristina Charro Lobato describes an application of digital photogrammetry to reconstruct the original extent of a prehistoric settlement damaged by the construction of a reservoir in the 1960s, also discussing the problems of identifying suitable sources. In a more recent context, Chapter 14 (*3D model generation and landscape change: contributions to image-based digital retrospection of the village of Breginj*) by Tatjana Veljanovski and Žiga Kokalj presents a study of a village in Slovenia which was severely damaged by earthquakes in 1976. This paper presents the generation of a 3D model of the original village using Structure-from-Motion software and an analysis of its changing landscape and the conservation of architectural and cultural heritage.

The final paper of the volume, Chapter 15 (*To trust or not to trust: maps vs. aerial photographs within political discourse*) by Sławomir Królewicz and Lidia Żuk presents an analysis of the reliability of maps created during the Soviet era and widely believed to be falsified deliberately to compromise their value. This is an important archaeological issue because these maps were used as the base for the Polish Archaeological Programme, and map distortions would carry serious implications for the spatial accuracy of sites plotted on them. The paper describes the use of vertical photographs to assess the map accuracy, concluding that there is no evidence for distortions in the cartography, in an object lesson in not accepting orthodoxies or ‘truth’ without question.

RECOVERING LOST LANDSCAPES

To conclude this introduction we return to the title of this book, which was chosen for its many potential meanings. Here its scope extends to destroyed features only recorded in archives and buried or unnoticed archaeological sites and landscapes that can be considered hidden until interpreted, and their meaning and significance explored in the search for knowledge and understanding.

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