Reviews

William S. Hanson, Ioana A. Oltean (Eds.), Archaeology from Historical Aerial and Satellite Archives. Springer, New York – Heidelberg – Dordrecht – London 2013, 341 pages, 118 b/w and colour illustrations, paperback, ISBN 978-1-4614-4504-3.

In the past, historical aerial and satellite resources seldom became objects of interest for archaeologists. In many older publications concerning aerial archaeology authors usually discuss applications of contemporary aerial photographs in landscape studies, either omitting or rarely referring to the rich archival sources. "Archaeology from Historical Aerial and Satellite Archives" is one of two recent attempts to fill that gap, and together with the book "Landscapes Through the Lens"[1] comprises the most complete compendium of that subject. The volume deals with the archaeological potential of declassified archives of 20th century military conflicts. As declared by the editors in the preface, the book aims to draw attention to the existence, scope of and potential access to historical aerial photographs and declassified satellite imagery. In that way the authors want to encourage the use of those resources in archaeological landscape research.

The 18 papers presented in the book are structured by the editors into three thematic parts. The first part and chapter is the editors' introduction to the main theme of the book, familiarising the reader with general ideas, the historical background and a short description of the material presented in the following chapters. The second part – "Opening Doors: Aerial and Satellite Archives" – contains three chapters (Chapter 2 by Cowley, Ferguson, Williams; Chapter 3 by McKeague, Jones; Chapter 4 by Fowler) and discusses the most important and the richest collections of aerial photographs and satellite imagery worldwide. It also refers to the problems of the organisation, cataloguing and accessibility of archival materials. The third and largest part of the book – "Historical Aerial and Satellite Photographs in Archaeological Research" – contains a selection of 14 articles with different case studies. The great variety of themes presented from near as well as remote parts of the world makes the reader aware that historical aerial resources have global coverage. The content of the volume is enriched by reproductions of numerous photographs and interpretative drawings helping the reader to understand the problems discussed, as well as an index.

The papers are ordered to answer four crucial questions that may be asked about historical archival aerial and satellite resources: (1) Why, when and in what historical circumstances have military aerial photographs been collected? (2) Which are the most important institutions that keep declassified military aerial archives and how are these organised? (3) What is the main potential of historical aerial photographs, and in which ways are they different from modern aerial sources? (4) How can those resources be used in archaeological landscape studies?

The structure and content of this volume does not leave any doubts about the methodological perspective of its authors. Empiricism is the dominating viewpoint in most of the papers. The level of technical knowledge presented by the authors can be considered awe-inspiring. The reader can find ready-to-use examples of the applications of archival aerial sources in landscape studies, and learn about technical details and the interpretation scheme for the objects recorded on the aerial photographs. Even more fascinating are descriptions of the historical contexts in which military aerial reconnaissance was carried out. In these respects the book can be recommended as a handbook for those who want to use historical aerial photographs for archaeological purposes.

The main goal of the volume, defined as the popularisation of aerial archives for archaeological studies, has without any doubt been consistently achieved by a proper selection of presented case-studies in their vast chronological and geographical diversity. Readers can familiarise themselves with the results of research involving archival aerial photographs from southern Ural (Batanina, Hanks in Chapter 12),

1 Cowley, Standring, Abicht 2010.

Armenia (Palmer in Chapter 16), Italy (Tartara in Chapter 8), Romania (Oltean, Hanson in Chapter 18), Mesopotamia's landscapes recorded on aerial photographs from the beginning of the 20th century (Bewley, Kennedy in Chapter 13), or World War I in Western Europe (Stichelbaut et al. in Chapter 5; Pollard, Barton in Chapter 6). Some articles have an especially strong influence as they relate to archaeological sites that have been popularised by mass media, such as the capital of the Khmer Empire, Angkor (Evans, Moylan in Chapter 17), or which are currently being shattered by civil war in Syria (Beck, Philip in Chapter 15).

The possibility of using declassified satellite imagery in archaeological studies also seems a very inspiring idea (Fowler in Chapter 4), especially given that until recently these were top-secret intelligence sources out of reach for any scientist. In some cases, articles refer to post-colonial nostalgia, or rather, the way that historical aerial photographs influence the imagination of modern Europeans by presenting images from previous epochs. The last remark should not be considered in any way as an accusation. Archaeology since its very beginnings has always caused and exploited, to a greater or lesser degree, feelings of nostalgia for past centuries.

The development of aviation during World Wars I and II made aerial reconnaissance the main source of intelligence about enemy forces. Aerial photographs were collected in vast numbers. During the Cold War technical advances led to the implementation of spy satellites that could collect data from every part of the globe. The single intelligence mission of the CORONA project was able to gather more information than all 24 preceding missions of U2 airplanes.[2] Archaeological sites from UNESCO's World Heritage List figure prominently – Angkor was recorded many times during the 1970s and 1980s by US intelligence satellites – as well as almost the whole Middle East, due to military conflicts in those areas.[3] Since the second half of the 20th century military aerial reconnaissance was also organised by the Soviet Union. However, only since the second half of the 1990s have some photographs become available for scientific research.[4]

It is worth emphasising that the themes of the published papers are not restricted chronologically to those periods that are normally considered to be the domain of archaeological research. Some interesting case studies relating to landscape changes in 20th-century urbanised areas are also present in the book (e.g. Chapter 7 by Young). Comparison of the differences between contemporary and historical aerial photographs has made archaeologists aware of the fact that 20th-century landscape transformations were especially extensive and dynamic. That observation caused a need for the study and identification of the main factors endangering archaeological heritage. Therefore even those authors who aim to focus on prehistoric landscapes, as soon as they begin to examine historical aerial photographs, have to refer to modern landscape processes. J. Iriarte, in the paper about settlement patterns of the Early Formative Mound-Building Cultures (Chapter 14), begins his presentation with a discussion about the influence of the modern landscape transformation of south-eastern Uruguay that was caused in the 1970s by the state programme of draining wetlands for rice cultivation. A similar approach is taken by I. F. Ortega and J. C. Sánchez-Pardo in their research about archaeological sites from Spain and Portugal (Chapter 11), as well as by I. A. Oltean in her study of the archaeological heritage of the Galați region in Romania (Chapter 9). The same problem is indicated in various forms in most of the chapters in the book. Oltean discusses the difficulty of studying vastly transformed landscapes, where even a basic search for control points and the geo-referencing of archival photographs can prove very hard.[5] Similar remarks can be found in the paper of P. Tartara that refers to the results of landscape studies in Italy. For her, the aerial photographs collected in the first half of the 20th century proved to be the most valuable source of information. They recorded the spatial patterning of towns and villages deriving from previous centuries that were later erased or transformed due to socio-economic changes in the second half of the 20th century. To illustrate that observation she presents a number of spectacular examples of archaeological sites photographed from the air. Not without significance remains the fact that in the past the area of interest was mostly covered with grasslands, while it is now forested, which limits the use of contemporary aerial photographs.[6] The extent of 20th-century landscape transformations is also discussed in the paper by T. Pollard and P. Barton. The main objective of the research was location of mass graves in the Pheasant Wood region in northern France. The search was inspired by the Australian Army. During the 20th century, traces of World War I were gradually obliterated. Lines of trenches and battlefields disappeared due to anthropogenic and natural factors. The main difficulty of the search for the mass graves was the fact that during World War I the landscape was severely devastated by artillery fire, and after the war it was reclaimed. The authors learned later that the mass graves were already recorded on

2 Chapter 4 (Fowler), 47–49.

3 E.g. Chapter 13 (Bewley, Kennedy), 221–242.

4 Chapter 12 (Batanina, Hanks), 201.

5 Chapter 9 (Oltean), 157–158.

6 Chapter 8 (Tartara), 123, 128, 136–140.

the intelligence photographs taken during World War I. However, they had been misidentified and considered to be an integral part of the German system of trenches. Eventually implementation of other remote-sensing methods (geophysics), as well as detailed analysis of the military reports, led to the correct identification of their location.[7]

A specific example of research into the modern landscape transformations caused by military actions during World War I on the Western Front is also presented in the paper of B. Stichelbaut, W. De Clercq, D. Herremans and J. Bourgeois. Trench warfare was especially devastating to archaeological sites. The aerial photographs from the first stage of the conflict record archaeological earthworks, field boundaries, drainage ditches and the spatial patterns of settlements. Many of those features were not erased from the landscapes until the late phase of the conflict, due to the intensification of artillery fire. Earthworks clearly visible on the photographs from 1914–1917 are not present on the aerial images from late 1917 and 1918. The authors also make a very interesting point about the way archaeological sites are made visible on the aerial photographs. During the first years of the conflict, drainage ditches were destroyed and various inundations created wet conditions. It resulted in the manifestation of hundreds of medieval earthworks through water marks. That observation leads to the conclusion that the destructive power of warfare can also be responsible for creating unique conditions and revealing unknown archaeological sites.[8]

It is difficult to imagine a better way to popularise aerial archaeology than through presentation of its potential and advantages by an appropriate selection of practical applications. This is especially because contemporary rules of publication require all scientific research to be completed with success. It makes it impossible to learn from the mistakes of others, because these are almost never mentioned. "Archaeology from Historical Aerial and Satellite Archives" puts the reader in such a situation. It consists of only positive examples, therefore creating the impression that its only driving force is cognitive optimism. For the same reason, the criticism inherent in all scientific research is restricted in this volume to discussion of technical dilemmas only. It refers to the physical and chemical deterioration of the photographs,[9] distortions and ground resolution of the images,[10] the generation of digital terrain models from satellite imagery,[11] and the factors influencing the manifestation of archaeological features on the aerial photographs.[12] Such studies can certainly bring valuable conclusions: however, they never touch upon the crucial question about the interpretation process itself. It could therefore seem that all physical objects registered on the aerial photographs are obvious to any person who has basic knowledge in such matters. But this is false. A direct example of such a situation is noted above in the paper about the mass graves from Pheasant Wood. As already mentioned the graves were recorded on the intelligence aerial photographs but were misinterpreted as being part of the German trench system. The empirical perspective can never give a full answer to the question about how archaeological narratives are created, nor how conclusions are defined and incorporated in those narratives. The interpretation of the location of the mass graves was redefined not because of the growth of empirical data, but because of the fact that the knowledge upon which the first interpretation was based changed, leading to a new explanation of the features recorded on the intelligence photographs. A newly-defined approach had to be proved and verified with empirical data. Such a remark is convergent with the opinion of Immanuel Kant, who believed that there is a difference between seeing, and the understanding of what we see. The first is only a mechanical registration of sensations, while the second process involves interpretation based on certain knowledge that leads to ordering of the received sensations and structures their understanding. In the reviewed book, the reader will find only an incomplete answer to the question regarding how archaeologists gain an understanding of what they observe on aerial photographs.

One of the consequences of the superficial (trivial) realism commonly accepted in the book is the uncritical opinion that intelligence aerial photographs and satellite imagery are "better" than oblique photographs collected for archaeological purposes. Aerial intelligence photographs are usually vertical (sometimes stereoscopic) and document vast areas without substantial gaps. Oblique photographs are usually observer-directed. It means that if the archaeologist has not recognised archaeological features or has misinterpreted them, she or he may not have photographed them.[13] While it is easy to agree with that observation, it cannot be used as an argument for the objectivity of vertical photographs. Aerial photographs do not tell their own stories. After all, it is the archaeologist who interprets them and speaks for them.

7 Chapter 6 (Pollard, Barton), 94–97.

8 Chapter 5 (Stichelbaut et al.), 5, 70, 74–77.

9 Chapter 9 (Oltean), 157–158.

10 E.g. Chapter 4 (Fowler), 49, 54–55. – Chapter 16 (Palmer), 281.

11 E.g. Chapter 15 (Beck, Philip), 274.

12 E.g. Chapter 5 (Stichelbaut et al.), 74–77. – Chapter 15 (Beck, Philip), 269–274.

13 E.g. Chapter 1 (Hanson, Oltean), 6–7. – Chapter 7 (Young), 106.

Development in the cognitive potential of science does not equate only to advances in the methods being exploited, but most of all depends on the development of theoretical perspectives that allow interpretation of the results obtained. Collected data will remain voiceless until they are placed in an interpretative scheme and become an integral part of archaeological narratives. Therefore, while the empirical approach present in "Archaeology from Historical Aerial and Satellite Archives" is very useful for the popularisation of the method, at the same time it determines and limits the potential scope of the topics that could be discussed by the authors of the papers. It becomes the main spur for the schematisation of the presented studies.

The empirical perspective and cognitive optimism are also responsible for the superficial understanding of the studied phenomena. The cultural landscape, present in most of the papers, is usually understood to be recorded on aerial photographs as a series of physical elements dispersed in space. There is no discussion about the cultural construction of landscape, nor about symbolism, the meaning of places or their mutual relations. In such an approach the cultural landscape is ahistorical, detached from the reality it was created in. Places become atomised material traces which have survived until the present day and were registered on photographs. For the same reason, as an explanatory scheme basic functional interpretation[14] or reference to historical events is used by the authors.[15]

The understanding of cultural landscape as a chronologically-differentiated set of physical elements also influences the manner in which the studies are presented. The authors of the papers are studying landscape transformations through comparison of various historical and contemporary aerial photographs in search of visible differences. In attempting to explain change, some authors refer to such factors as forestation, urbanisation and industrialisation, the mechanisation of agriculture, and so on. In fact, such an approach reduces a vast diversity of processes to vague terms, which give the appearance of explanation but without touching the very core of the problem.

Not without significance for archaeological applications of historical aerial photographs remains the way archaeologists perceive the potential of the method. Preliminary knowledge and the accepted theoretical approach influence the scope and potential research aims before the main studies are undertaken. Recently, with the development of digital technologies, users can gain free access to good quality and high-resolution aerial and satellite images from all around the world (e.g. Google Earth, Microsoft Bing). Therefore most archaeologists underrate archival resources. In general the opinion is that the archival photographs are technically imperfect, have lower resolution, are monochrome and record less detail than modern images. However, these limitations do not determine their cognitive potential. In certain circumstances historical sources can prove to be more valuable than modern, high-resolution resources.[16] Due to the large number of photographs taken in the past there is often a chance of finding images of the same area from different periods.[17] A comparison of modern and historical sources allows us to register physical traces of landscape transformations.[18] Aerial photographs from the beginning of the 20th century register spatial patterns inherited from previous centuries, before the era when fast development or destruction by military conflicts altered them. These processes became especially prevalent during the second half of the 20th century and often had a devastating impact on archaeological heritage.[19]

The position of cognitive objectivity is weakened, to a certain extent, by discussion about the historical and political circumstances of the development of aerial archaeology in different countries. It allows investigation of the influence of politics on science. About 50 % of all archaeological sites in the United Kingdom were discovered due to the archaeological aerial reconnaissance organised since the end of World War II.[20] However, the situation in Central and Eastern Europe, the Middle East and Asia was completely different. Many countries for a long time restricted or banned the development of civil aviation.[21] Such a situation existed until recently in Greece, Bulgaria and Turkey.[22] In Italy, observer-directed aerial reconnaissance was restricted until the last decade, as it was in Hungary, Romania and Poland. In the period preceding the political transformations of the last decades of the 20th century, the conditions for the development of aerial archaeology were very limited. In his paper Z. Visy (Chapter 10) discusses the position of aerial archaeology in Central and Eastern Europe, and analyses the political difficulties and absurdities that were the main obstacles for archaeologists from the Eastern Block. Despite these limitations archaeological aerial reconnaissance was organised to document already-known archaeological sites or, more rarely, in search of new ones. A similar point is made by Oltean and Hanson

14 E.g. Chapter 12 (Batanina, Hanks), 199–219.

15 E.g. Chapter 5 (Stichelbaut et al.), 69–85.

16 E.g. Chapter 3 (McKeague, Jones), 33. – Chapter 8 (Tartara), 124.

17 Chapter 1 (Hanson, Oltean), 6–7.

18 Chapter 2 (Cowley, Ferguson, Williams), 26.

19 E.g. Chapter 2 (Cowley, Ferguson, Williams, 18–19). – Chapter 5 (Stichelbaut et al.), 70.

20 Chapter 1 (Hanson, Oltean), 3.

21 Chapter 15 (Beck, Philip), 262.

22 Chapter 1 (Hanson, Oltean), 4.

(Chapter 18). According to them, the 20th-century political situation in Romania made the development of aerial archaeology almost completely impossible.

Part of the book is devoted to the problem of the organisation of TARA[23] (Chapter 2) and NARA[24] (Chapter 4) – the archives that keep the largest collections of archival aerial photographs and satellite imagery. The collections can be searched with a specially-designed internet browser (Chapter 3).[25] The authors discuss the difficulties of orienting finding-aids for specific research problems and of sharing spatial information beyond single institutions. P. McKeague and R. H. Jones (Chapter 3) discuss the idea of enabling users to view the anaglyphs processed from stereoscopic pairs of archival aerial photographs. That concept seems to be especially interesting in the case of transformed landscapes, because it can bring a new insight to previously-unknown archaeological sites, enabling a different perspective.

"Archaeology from Historical Aerial and Satellite Archives" is without doubt a valuable scientific publication. The reader will find in it many solutions and suggestions relating to the potential and applications of historical aerial imagery in archaeological landscape studies. The theme will certainly develop through the coming years, because in many countries archaeologists do not yet appreciate the potential of archival aerial sources. As mentioned earlier, the book is empirically-oriented, and most of the authors focus on the practical applications. It may give the impression that the main task of archaeologists is to collect the data of the material remains of past human acts. The book lacks sufficient theoretical discussion and socio-cultural interpretation. The reader may learn from the book about the phenomena that could potentially be registered on photographs. But she/he will never find an answer to the question about archaeologically-important phenomena that might not be expected to be seen on aerial photographs. There is no clear message stating that aerial photographs, as with any other archaeological sources, are incomplete.

The interpretation of aerial photography is always based on specific knowledge. We are able to recognise those registered objects and phenomena that we already know, or expect to find. It is likely that there is much greater potential in historical aerial photographs than we are currently aware of. However, at the present moment we do not have the means to recognise it.

23 The Aerial Reconnaissance Archives.

24 National Archives and Records Administration.

25 See also Chapter 4 (Fowler), 47–48.

Literature

Cowley, Standring, Abicht 2010

D. C. Cowley, R. A. Standring, M. J. Abicht (Eds.), Landscapes through the Lens: Aerial Photographs and Historic Environment. Occasional Publication of the Aerial Archaeology Research Group 2, Oxford 2010.

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