

LANDSCAPES FULL OF PITS: DISAPPOINTMENTS AND PROSPECTS FOR AERIAL SURVEY IN THE BALTIC SEA REGION

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Introduction

In the countries of the Baltic Sea region, as in most other European countries, the history of aerial archaeology began in the 1920s or 1930s (Norrman 1995; Olesen 2005; Urtāns 2005; Jarockis 2005; Kobyliński 1999, 2005). In the beginning it was mostly known early-medieval strongholds that were photographed. There are many reasons why aerial archaeology has not yet achieved a great deal in the Baltic Sea region. Currently, attempts at demonstrating its usefulness are increasingly frequent and its scope has expanded to include both scientific research and protection of the archaeological heritage.

These attempts have been strongly supported by experienced aerial archaeologists from Germany and the United Kingdom. This support has taken various forms, such as guest lectures, exchange visits between scholars, joint research, conferences, workshops etc. (Bewley, Rączkowski 2002; Barford 1998; Palmer 2005). As a result, archaeologists from the Baltic Sea region have come to understand the complexity of taking and interpreting aerial photographs. The best examples of photographed archaeological sites are now widely used to promote the method and to teach its applications (through photo-interpretation and mapping). Usually the chosen photographs show spectacular images of complex archaeological features, such as enclosures, pit alignments or circular and linear features. The images are highly persuasive and excite the imagination of archaeologists and others alike. No wonder

that many are driven by the desire to discover similar incredible features! Certainly, the emotions that accompany the discovery of the past play an important role (cf. Rączkowski 2002) and a successful *tracking down* gives huge satisfaction, a sensation of metaphorically *taking possession* of the discovered.

Discovering spectacular archeological sites has its non-emotional dimension too. In countries where aerial archaeology, despite its long tradition, still struggles to gain the status of a legitimate and fully accepted method, presentations of striking examples can be essential to a final recognition of the value of aerial photography to archaeology. A clear and complete picture of the spatial structure of a site can be a good argument for the usefulness of the method in discussions with archaeologists, for most of whom excavations are the essence of archaeology (cf. Bewley 2005). Obviously, the more spectacular the features in a photograph, the more persuasive it is and the more powerful are its suggestions about the effectiveness of aerial photography (cf. Nowakowski, Rączkowski 2000; Rączkowski 2005).

It is only natural that those new to aerial archaeology should take to aerial reconnaissance in the hope of a spectacular success in *tracking down* fantastic archeological sites and stunning colleagues with their *hunting trophies*.

Are there bears in the woods?

Life teaches us that reality hardly matches our dreams and expectations. *Hunting the bear* is not that simple in the Baltic Sea region. Much less attractive *partridges* are more likely to be the trophy. This brings nagging questions such as "Am I not able to identify enclosures, Roman camps, ancient roads, etc. from above?". With time, disappointment grows that "There will be no great *hunting trophies*"!

Why is the divergence between expectations and the reality of aerial reconnaissance so great? The answer is undoubtedly complex. However, the basic factor lies in our pre-existing knowledge about archaeological sites. One thing that the renowned British photo-interpreter Rog Palmer does before interpreting aerial photographs

is to learn about previous archeological studies of the area (cf. Žuk 2005). Expectations about the content of photographs are built on this knowledge, making the process of interpretation easier.

The same pattern applies to aerial reconnaissance. Preparation should not be limited to planning the flight route and learning about the geomorphology and soil structure of the region (Musson 1995). It should also include reviewing archaeological knowledge of the area. It is necessary to study the results of archaeological surveys and excavations in particular. Taking but a cursory look at available excavated site plans, one concludes that features similar to those found in Great Britain, France or southern Germany cannot be found in the Baltic Sea region. Archaeological features recorded during excavations in this region are mostly pits of various functions (postholes, food-storage pits and waste pits, pit-houses and graves etc.). Forget the *bears* – all we have are *partridges*!

Pits, pits, pits

For obvious reasons archaeological sites with numerous pits indicated by cropmarks are not of much interest to many aerial archaeologists. Photographs of them, if taken, are rarely thoroughly studied. In consequence there are no established criteria for an unambiguous interpretation of the functions of such features.

During aerial reconnaissance the archaeologist observes the earth's surface and looks for indicators that let him/her identify archaeological features. These indicators include cropmarks, soilmarks, shadows and highlights (the bright areas that are the opposite of shadows). While the aerial archaeologist observes the earth's surface, his/her mind is processing and interpreting all this information. In these cases, 'interpretation' includes *excluding* features which are judged *not* to be of archaeological origin (along with the matching decision *not* to take a photograph). When the archaeologist sees a feature which displays the characteristics of an archaeological feature, he/she decides to take a photograph. The process of observation and identification also involves categorising. Each observed feature is constantly named and categorised, so cropmarks forming polygons may be frost wedges, parallel

lines may be the results of crop rotation, a circular feature may be a levelled barrow, crops of anomalous colour may suggest a place of raw material extraction (Rączkowski 2001). This kind of process applies also to the cropmarks of pits observed from the air.

How can we distinguish cropmarks of pits produced by past human activity from those of pits resulting from natural processes and/or recent human activity? Even the best aerial archaeology handbook (Wilson 2000) does not answer this question. One way is to rely on available studies of different kinds of pits in excavated archaeological sites.

Excavated pits can be classified in many ways, depending on the criteria accepted (cf. Minta-Tworzowska 1994). The aim of this paper is not to offer a complete classification of pits. My objective is to point to features which may help to categorize pits during aerial reconnaissance (or later while interpreting the resulting photographs). In this context the shape of a feature is the main criterion. However, edge definition can also be important. Taking into consideration the morphology of observed cropmarks we can distinguish:

- (1) regular-shaped structures, and
- (2) irregular structures.

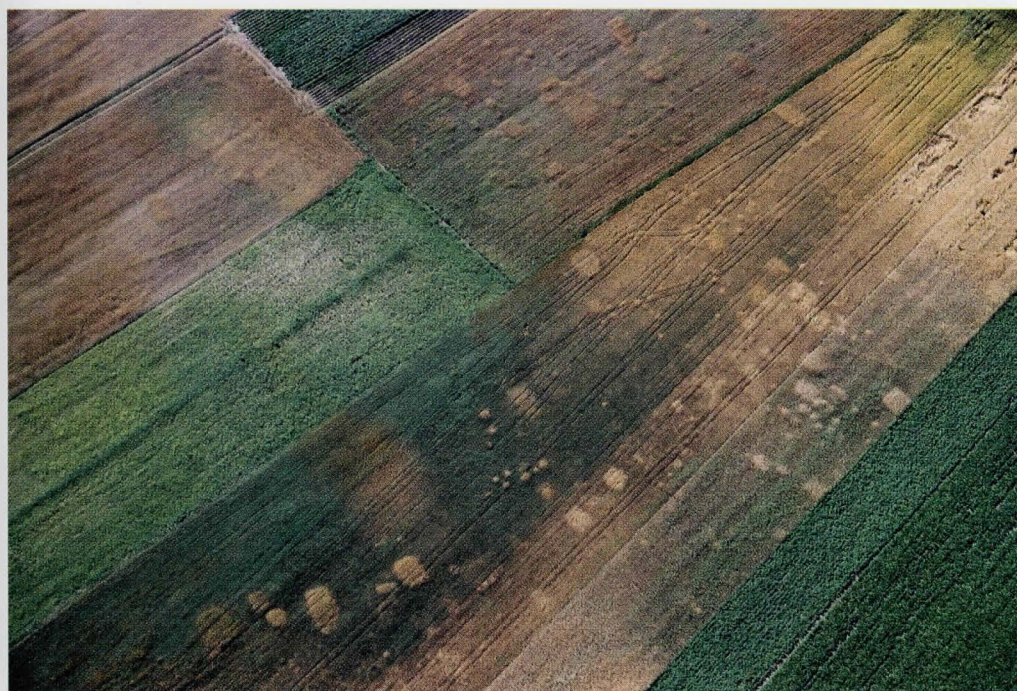
It is commonly accepted that a regular-shaped feature strongly indicates a human origin. However, a regular shape does not guarantee an ancient provenance although it is very probable that a human contributed to the making of such a feature. Therefore, while categorizing a feature, we look at visible cropmarks and analyze the regularity of the emerging shape. Consequently, more specific categories can be distinguished:

- (1) circular,
- (2) oval,
- (3) square,
- (4) rectangular.

Finding cropmarks of these shapes may suggest the presence of archaeological features. Circular features of 0.5m to 1.0m in di-

Figure 1. > Ludzisko, Kujawy region. The circular shape of the cropmarks, as well as their size and arrangement, suggests interpretation as former postholes. Photo: W. Rączkowski, 21.06.2000; © IA&E PAS Poznań.

Figure 2. > Parchanki, Kujawy region. The diverse but regular shapes of the cropmarks, and their size, may indicate the presence of a former settlement. Photo: W. Rączkowski, 21.07.2003; © IP AMU Poznań.



ameter may indicate the presence of postholes (Figure 1), while rectangular features, larger in size, usually indicate the presence of pit-houses/sunken houses (Figure 2) or inhumations. During aerial reconnaissance it is difficult to perform a detailed analysis of visible cropmarks, aiming at an instant identification of the feature's implied function. A detailed analysis is performed later, when photographs can be closely examined and interpreted. At that stage the information about the context and size of individual features is analysed in detail. It is then that knowledge about forms of archaeological features discovered during excavations is essential. An interpretation informed by this kind of information can appear more convincing to the *digging* archaeologist.

The second important group of cropmarks which may indicate pits are irregular forms. Absence of regularity in the shape brings numerous doubts when attempting categorization during reconnaissance and at the subsequent stage of interpretation. Should

Figure 3. Ligota Polska, Lower Silesia region. It would be risky to interpret irregular and poorly visible cropmarks as representing settlement pits. Field-walking survey of this area confirmed the presence of numerous fragments of pottery from the Late Roman Iron Age and Early and Late Medieval Periods as well as the Modern Period. Photo: W. Rączkowski, 25.06.2006; © IA&E PAS Wrocław.



Figure 4. Piaski, Kujawy region. The regular distribution of the cropmarks indicates a vast former settlement, though with no clear concentration or internal structures. Photo: W. Rączkowski, 2.07.2006; © IP AMU Poznań.

one give up on irregularly-shaped cropmarks altogether? A review of available site plans of already excavated sites, especially multi-cultural ones, suggests an answer to this question. Long-time occupation of a location often leads to complex stratified structures, observable also in their cross-sections during excavation. Every archaeologist can provide numerous examples of intersecting archaeological structures. What arrangement of cropmarks can overlapping and intersecting structures produce in terms of the cropmarks then observed by the aerial archaeologist? The answer is simple: irregular (Figure 3). In most cases cropmarks cannot reflect the complexity of such a structure (for example by showing diverse vegetation growth within it). Therefore, we can assume that an irregular arrangement of cropmarks can *also* indicate the presence of archaeological pits. These may sometimes occur in an area which also contains regular-shaped pits.





< Figure 5. Sulęcín, Wielkopolska region. Cropmarks in a relatively restricted area indicate a former settlement. Photo: W. Rączkowski, 6.07.2002; © IP AMU Poznań.

< Figure 6. Prusinowo, Wielkopolska region. Small concentrations of cropmarks suggest the presence of two former individual households. Photo: W. Rączkowski, 6.07.2002; © IP AMU Poznań.

Another important element in interpreting pits visible as cropmarks is their spatial distribution. The following patterns can be distinguished:

- (1) scattered,
- (2) clustered,
- (3) nested.

Each of these may represent a kind of settlement pattern (e.g. Clarke 1977). Therefore, the spatial structure/distribution of pits manifested by cropmarks allows an observer to draw conclusions about the settlement pattern: from large settlements with no apparent centres within the settlement structure (Figure 4), via smaller dense settlements (Figure 5) to individual households visible as a small cluster of pits (Figure 6). Within areas with numerous scattered pits it may be possible to distinguish some patterns in small plots (Figure 7). They may be indicative of spatial

Figure 7. Karczyn, Kujawy region. Regular and relatively large pits visible as cropmarks may be interpreted as pit-houses surrounding an open square. Photo: W. Rączkowski, 8.07.2000; © IA&E PAS Poznań.



design in the settlement. Undoubtedly knowledge coming from analysing the spatial arrangement of pits can significantly contribute to our understanding of past societies.

Pits and spectacular features

Taking photographs of pits does not give much satisfaction during flight. After having seen several sites where pits are visible as cropmarks the aerial archaeologist's attention and concentration may decrease noticeably. This seriously jeopardizes the effectiveness of the reconnaissance. Therefore it is worth remembering that pits may at the same time both disclose the structure of the whole settlement and indicate parts of individual structures which can be of great interest (Figure 8). The above-mentioned patterns in the spatial design of settlements are examples of the double relevance of pits, as in the case of pit-houses/sunken houses seemingly built around the central square or along a 'street' (Figure 9).

Figure 8. Giecz, Wielkopolska region. Amongst numerous pits visible as cropmarks, some indicate two circular structures (in the centre and at the top of the photograph).

Photo: W. Rączkowski, 28.06.2003; © IP AMU Poznań.

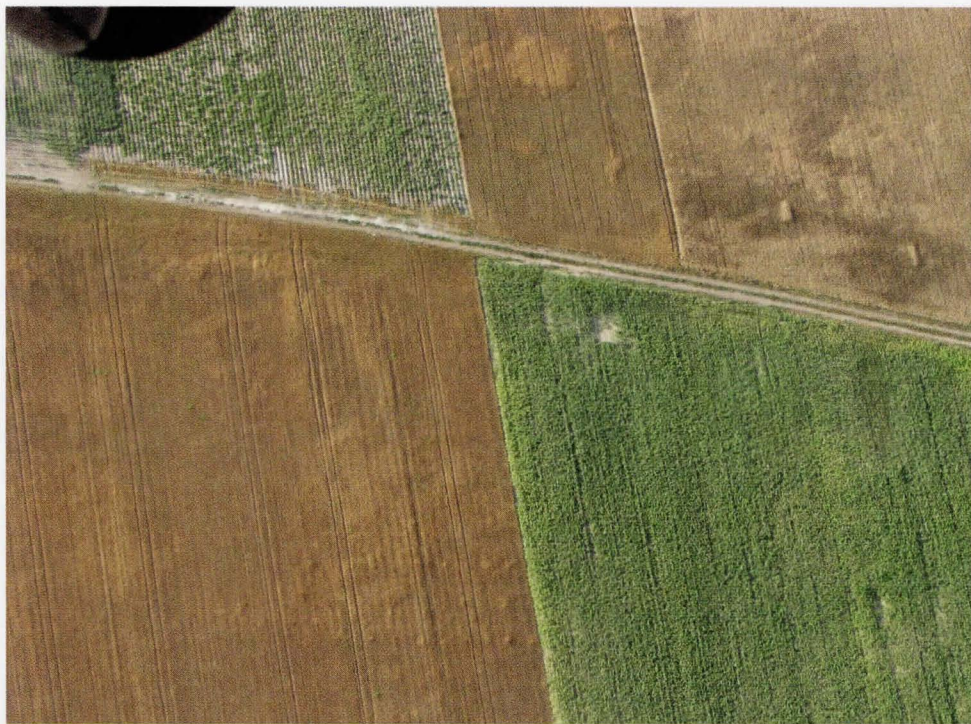




Figure 9. Mutowo, Wielkopolska region. Pits (sunken houses?) are distributed around a central square (market-place?) with a street along one of its sides. Photo: W. Rączkowski, 3.07.2006; © IP AMU Poznań.

Small pits can also reveal the presence of long-houses. There is no doubt that the discovery of a long-house location through crop-mark evidence enlivens the imagination of both aerial archaeologists and field archaeologists alike (see Shanks 1992). Such a discovery can be compared to the emotions experienced during the exploration of a rich grave and the gradual revealing of its contents.

Emotions have both positive and negative effects in aerial reconnaissance. On the one hand they make the aerial archaeologist concentrate more intently during flight. On the other hand an interesting structure may distract the archaeologist's attention from nearby features (Figure 10), leaving them ignored and unrecorded (see also Cowley 2002).



< Figure 10. Miechowiec, Kujawy region. The impressive cropmarks of postholes of a house (bottom of photo) attracted the photographer's attention so much that he did not notice a similar house at the top of the image. Photo: W. Rączkowski, 24.07.2004; © IP AMU Poznań.

< Figure 11. Strzelce, Kujawy region. Cropmarks reveal the presence of variations in surface soil-content above buried structures and pits. Were any of the pits of human origin? Photo: W. Rączkowski, 21.06.2000; © IA&E PAS Poznań.

'Suspicious' pits

During a reconnaissance flight we frequently notice cropmarks revealing a variety of features, mostly pits. Their arrangement can be regular (e.g. Kijowski, Żynda 2005), irregular or clustered. This does not necessarily mean that all of them are of interest to archaeologists (Figure 11). Whether we have actually come across an archaeological site is a huge interpretation problem both during flight and in subsequent analysis of the photographs. I am afraid that even repeated recording of the same cropmarks in succeeding years will not always allow us to reach a definitive interpretation. Consequently, field-walking survey of the area may be needed.

Sometimes the spatial arrangement of pits clearly indicates their anthropogenic origin. However, their characteristics may raise doubts in the interpretation process. On the one hand some of their characteristics may lead us to interpret them as astonishing archaeological structures, while on the other hand the context in which they occur may make us doubt their archaeological relevance (Figure 12). Again, field-walking survey is probably the only way to verify the findings.

'Suspicious' pits visible as cropmarks are a serious problem during aerial reconnaissance. Doubts about whether they are worth photographing are raised all the time. The lack of clear classification criteria to determine whether the pits are remnants of past societies' activities (or not) raises constant doubts in the mind of the aerial archaeologist: "What am I looking at? Can I identify archaeological structures? Is my interpretation of the cropmarks adequate?". These are dilemmas that often cannot be solved during flight, or even later when the photographs are analysed in the archaeologist's office. In a land of pits this is one of the uncertainties that archaeologists have to face in their daily work.

Pits and 'past reality'

Experience of the Baltic Sea region's archaeology to date demonstrates that ditch-defined structures similar to those seen in Great Britain, Germany or France cannot be expected here. A



Figure 12. *Wielowieś, Kujawy region. Cropmarks reveal a large regular structure. An archaeologist would surely like to interpret this as a large hall – a temple or a communal house – with a neighbouring sacred pond. Or are the cropmarks traces of a former orchard? Photo: W. Rączkowski, 21.07.2003; © IP AMU Poznań.*

discovery of a Roman villa, Roman temporary camp, Neolithic rondelle or Celtic *Viereckschanze* remains unlikely in this area. In the past landscape around the Baltic Sea there were strongholds, megalithic monuments and burial mounds. However these structures never dominated the landscape. They appeared sporadically. The basic settlement pattern consisted of smaller and larger settlements interspersed with utility pits, pit-houses and/or surface dwellings.

Pits were essential to everyday life in the historic landscapes of the Baltic Sea region. This was the world in which humans lived between Neolithic times and the Middle Ages in this part of Europe. We will never be able to understand historic landscapes (Tilley 1994) if we ignore the significance of pits in our research.

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