Aerial archaeology method in the face of theory

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Summary

Contemporary archaeology is undergoing dynamic changes. The process is largely a result of new theoretical concepts being constantly developed but also a product of disappearing limitations in international scientific exchange and easier access to up-to-date publications. Consequently, there are favourable conditions in many countries to abandon the principles of the widely criticized cultural-historical approach to archaeology. A number of new works published apply novel methods and models which are developed on the basis of new paradigms (specifically within processual archaeology). Those methods and models are often supposed to be a sign of the author's original approach to archaeology but, in reality, they merely mask the traditional approach. Empiricism, inductionism and objectivity reappear in disguise. This practice reveals lack of theoretical and methodological reflection.
Thus, it seems crucial that relation between method and theory in archaeology is identified. The opinions on theory and its role have undergone many significant changes. The same applies to the method. Divergent concepts on the relations between theory and method and a widespread belief among archaeologists that the choice of method automatically presupposes the choice of theoretical orientation, outline the important problem of the role method plays in theoretical approaches. Questions about the reciprocal relationships between theory and method remain ever topical. In scientific research there is a broad variety of methodological options because the number of methods used in archaeology seems virtually unlimited. There are methods of ground prospection, methods of excavation, methods of describing

and recording of archaeological material, methods of explication and interpretation of past events, methods of studying site formation processes, and many others. It is widely accepted that some methods have no connection with theoretical thought whatsoever – they are so to speak "theoretically neutral". In my opinion, showing the mutual relations between "theoretically neutral" aerial photographs and various archaeological approaches may shed some light on the relationship between theory and method.

Three conditions had to be fulfilled before aerial photographs could become a useful tool for archaeologists. Two of them were of technical nature: to be airborne and able to record the surface of the ground from an elevated position. The third condition required new thinking, recognition of the fact that archaeological features and sites could be observed from certain altitude and that these observations could be useful in addressing research problems. The two first conditions had already been met by the time when archaeology emerged as a science, which was in the middle of the 19th century, though the scientists of that time did not recognise the usefulness of aerial photographs in the study of the past. The dominating theory of cultural evolution steered archaeological thinking of the past and its interpretations and it limited the scope of interest, scientific problems and solutions. Applying the basic ideas of evolutionism, archaeologists fully accepted the evolutionary-comparative method, i.e. the comparison of cultural forms and states, and blatantly disregarded their context. Consequently, they focused on chronological problems, endeavouring to place cultural forms and phenomena within some evolutional sequence. Aerial photographs could not be used for that purpose.
The military, however, showed an early interest in "bird's eye" views. From the very beginning they focused on aerial photographs taken from balloons and used them for survey purposes. The invention of the aeroplane in the early 20th century soon put balloons in the shade. The First World War saw further development in terms of aircraft and camera technology. Military air reconnaissance made the number of aerial photographs taken explode. Undoubtedly, archaeological objects must have been accidentally recorded at least on some of them.

The First World War also marks the beginning of first and modest experiments with aerial photographs in archaeology (e.g. L. Rey, T. Wiegand, G.A. Beazley, A. Poidebard), though it is widely accepted in the literature of the subject that it was O.G.S. Crawford who played the leading role in forming and formulating the principles of aerial photography and making it known. Crawford's recognition of aerial photographs was based on theoretical foundations he had adopted in the first years of the 20th century. At the beginning of his scientific career, Crawford came under the influence of two mainstream trends in archaeology of his times: evolutionism and diffusionism. The lecture he gave in 1911, The Distribution of Early Bronze Age Settlements in Britain, clearly reflected his theoretical thinking. Among the scholars who helped shape Crawford's ideas were P.J. Wiliams-Freeman, H. Peake and A. de Mortillet.

It is also widely accepted that Crawford's next lecture, entitled Air Survey and Archaeology and held on 12 March 1923, was the first scientific rendition of the new method. The main point of the lecture was to establish the age and origin of lynchets he thought to be of Celtic origin . The study was based on a detailed analysis of stratigraphic data relations between a number of objects whose chronology had been known . Crawford concluded that lynchets forming a mosaic of square or rectangular fields had been introduced at the beginning of the La Téne period (or even late Bronze Age) just after the first wave of Celtic migration. The system was used until the Roman invasion. Narrow and stretched lynchets were introduced by Saxon tribes and used until the end of the 18th century. Crawford made some general remarks on aerial photography only towards the end of his presentation, but he managed to show the benefits of the new method and its applicability in solving research problems. The lecture was on Celtic lynchets and aerial photographs provided for a penetrating analysis of the issue. In sum, Crawford demonstrated the potential of this method for archaeology presenting case study.
Crawford represented the evolutionist-diffusionist school of thought in British archaeology, which was brought into being in the early 20th century. It is not a difficult task to identify elements of both theories in his work. Crawford aimed at

establishing chronologies of objects and arranging them in a chronological sequence. He made wide use of metaphors, which was typical evolutionism. He stressed the importance of analogy in the interpretation of spatial arrangements and in his explications he referred to cause-and-effect relations. Discontinuity in the emergence of new cultural forms was often explained in terms of migration. The geographical method makes it possible to determine the origins, spread and boundaries of a culture. In this approach opinions of a general nature were formed on the basis of source archaeological data. The empirical nature of Crawford's scientific procedure let us believe that he fully accepted the positivist notion: the greater number of sources (record, data), the better and more complete our knowledge about the past.
Crawford's treatment of sources (archaeological record , data) was very characteristic. He regarded archaeological sources (record , data) as objective and physical objects in which past world was preserved. The source (archaeological record, data) is independent of the researcher who uses it to reconstruct past events and cultures. It is static and passive like a fossil palaeontologists understood it then. In this context Crawford considered aerial photographs to be an objective representation of objectively existing archaeological sources (record, data). In other words, he believed in what he saw and treated photographs as a true rendition of the real world. He claimed that a photograph registered everything an archaeologist could see with the naked eye. The process of the reconstruction of the past world by means of photographs requires the archaeologist to be passive and uninvolved. Observation is reduced to 'pure' visual perception. The archaeologist is equipped with an 'innocent' eye and 'pure visual perception' belongs to the canon of empiricism. In such an approach to archaeology, an aerial photograph has the same validity as other archaeological sources (record, data),.
Owing to Crawford's propagating skills, many followed in his footstepsCrawford's activity soon gained many adherents. They were both pilots, fascinated by the romanticism of the journey into the past, and professional archaeologists. Since the very beginning some tendencies dominated and influenced the future development of the method and the ways it was perceived by archaeologists. Researchers were divided into two groups: those who practised aerial archaeology, i.e. the taking of

aerial photographs, and those who used photographs in their archaeological research. The first group consisted of amateurs who became fascinated by the new method. They had enough financial resources, time and flying skills to be able to make archaeological discoveries and "compete" with professionals. Academic research owes to them a number of extraordinary discoveries and scores of information on new archaeological sites. The joy of discovery was accompanied by the reflection on the nature of soilmarks, cropmarks and shadows. They played decisive part in developing improving the methods of regular air reconnaissance and taking aerial photographs. They behaved like collectors or antique dealers. Flights made it possible to discover new sites and taking pictures of the sites was like collecting objects.

Academic archaeologists soon accepted aerial photographs as a tool of discovering and registering archaeological sites. Field archaeology made aerial photographs one of the main methods of site recognition applied prior to excavations. However, aerial photographs were not regarded as equally important in solving research problems. Questions archaeologists asked were limited to the chronology and spatial structure of the site – the latter solely for the purpose of planning the excavations.

It seems that this qualified success of aerial archaeology influenced the scope of the research questions asked. The belief that archaeological material directly informs of the past limited the archaeologist's main interest to pure documentation of the site and establishment of chronology. This sufficed to place the object in chronological order and to "reconstruct" the past. Aerial photographs were gradually limited to the initial phase of source requisition, i.e. to ground survey. Suggestions to use photographs for map-making and problem-solving were put in the shade.

The positivist approach to archaeology limited the scope of questions that could be asked on the basis of aerial photographs. On the other hand, aerial archaeology brought some new questions with it and proposed new interpretations of traditional scientific problems. In a series of spectacular discoveries new sites were identified (e.g. Woodhenge), which made archaeologists reinterpret their views on many issues related to the past. Aerial photographs also introduced a new perspective to the studies of past agriculture: an analysis of the changeability of field systems. C. Fox,

clearly inspired by Crawford, gave rise to a new trend called landscape archaeology, which chose aerial photographs to be its key source of information.

The development of British archaeology from the 1930s till 1960s diversified the ways the science was practiced by introducing analytic methods from other sciences but also formed a certain pattern of discourse in which such categories as object type, archaeological cultures and groups, form of evolution, migration and diffusion played a big part. Numerous discussions led gradually to a synthesis of different theoretical reflections and to the emergence of a cultural-historical trend which manifested itself by a variety of differently stressed elements of functionalism, neo-evolutionism and Marxism.

The discussion in academic circles had some impact on aerial archaeology. The way aerial photographs were used changed considerably. J. Bradford, M. Beresford and J.K.S. St Joseph took a turn towards the technological and economic interpretation of facts registered on photographs. It resulted in the recognition of new classification criteria, and consequently, shifted the focus of the debate to interpretation and not description alone. Photographs became objects of analysis (equivalent to written sources and maps in the work by Beresford and St Joseph) and not mere illustrations.

Diffusionism made an important contribution to the cultural-historical approach by introducing maps as a tool of archaeological analysis. Bradford used maps not just for the analysis of distribution but also in the studies of past landscape. A map did not only include cultural elements from a given period or a given archaeological culture, but also topographic elements important for a certain type of landscape (under the influence of G. Clark's ecological functionalism). In this way one could study cultural objects in their relation to the past natural environment.

Analysing the fields of interests of academic archaeologists, one can clearly see that they focused on the studies of material culture and the technological and economic aspects of culture. By the force of events aerial photographs were put in the shade, far away from mainstream archaeology. Even Bradford's, Beresford's and St Joseph's splendid works, which opened up new scientific horizons (e.g. landscape

archaeology, medieval archaeology), could not reverse the process. Aerial photographs were, however neither forgotten nor ignored. On the contrary, in all major work on the general aspects of archaeology, aerial photographs are considered one of the most important methods of prospection. Even Crawford treated them that way towards the end of his scientific career.

It seems, however, that the first years after the Second World War brought some regression in the application of aerial photographs in archaeology. The establishment of the Cambridge University Committee for Aerial Photography (CUCAP) and a collection of aerial photographs in 1948 did not change the situation. St Joseph, curator of the collection, carried out regular air survey of Great Britain but he focused mainly on the discovery and documentation of archaeological sites and published photographs in a very selective and schematic way. St Joseph's restrictive attitude towards aerial photographs did not help disseminate the method in academic circles. Aerial archaeology became less and less attached to the ideas and objectives of academic science.

The situation was similar in the USA. Aerial photographs played marginal role and the American reflection was very much the same as the British. Photographs were considered useful in making detailed plans of sites. They were also applied to the identification of field systems and, together with field studies, in the studies of economic aspects of North American archaeological cultures.

Positivist objectivism, empiricism and inductionism dominated archaeological thinking. This was clearly evident in the attitude towards research practice and the separation of archaeological data from their interpretation. The main aim of the archaeologist was a possibly detailed and objective description of data. One needed to collect all data available to be able to know the past. This empirical approach made archaeologists concentrate on information and data collection. In common thinking archaeology was perceived as synonymous to data collecting. That is why so much attention was attached to methods used in field archaeology. The more data one managed to collect, the better and more complete the knowledge of the past was. This thinking provided the foundations for archaeological conservation. One of its main aims and activities was the discovery and registration of archaeological sites.

This was especially important in the formation of conservation policy after the Second World War.
The period after WW2 brought dynamic economic activity aimed, among others, at the restoration and building of cities, industrial facilities and roads. Consequently, many archaeological sites came under threat. From the objectivist viewpoint, which was predominating in archaeology, the destruction of sites was considered irrevocable loss of information. The threat was recognized and expressed for the first time in A Matter of Time. It offers a careful analysis of threats that archaeological sites face due to the development of industry, communication, building and agriculture and formulates the policy of the protection of archaeological heritage. There was no controversy that protection of archaeological heritage requires first of all a precise record of sites, their localisation, function, chronology and state of preservation. Aerial photographs seemed to be the most effective tool for that purpose. When the Royal Commission on the Historical Monuments of England ranked aerial archaeology as one of the most important methods in its programme of conservation, the science gained momentum. The organisational structure was extended, enabling air reconnaissance on a much larger scale and creating conditions for storing and accessing photographs. It was also the next step in limiting the application of the method to field archaeology. And since the conviction of the theoretical neutrality of field studies was never questioned, aerial photography separated itself from the methodological reflection in British archaeology.

It is widely assumed that New Archaeology, later called processual archaeology, initiated a broad discussion on theory and explication procedures in archaeology. The 1960s and 1970s, when processual archaeology came into being, brought also a wide spectrum of technological achievements into the humanities. The standardization of methods and the repeatability of procedures fitted well into the belief of cognitive objectivity and the possibility of formulating universal laws and general theories. Methods borrowed from natural sciences were to guarantee the objectivity of cognition.
Since the turn of 1960s and 1970s aerial archaeology has been undergoing dramatic

technological changes, practically in every aspect. Aerial photography has been included into a group of remote sensing methods. Remote sensing encompasses a variety of registration platforms including satellites but also applies cheaper methods of launching electromagnetic radiation registering devices (kites, model planes, balloons). New devices have been designed to fulfil the need to register different ranges of electromagnetic radiation. New methods of data processing have been developed and computers have become indispensable.

This technological "revolution" in aerial photography was possible mainly (though not exclusively) thanks to processual archaeology. Processual archaeology stressed the necessity of precise measurements of cultural and natural features and the objectivity of the process, and thus opened up new possibilities to apply the potential of aerial archaeology and import methods and equipment from other fields of science (e.g. computers, GIS, satellite images). Processual archaeology also viewed scientific problems from a new angle and helped formulate new research proposals. New technology was supposed to serve the modern way of practising archaeology. Consequently, the technological aspect is still widely discussed among aerial archaeologists.

The variety of scientific issues inspired by processual archaeology has resulted in a substantial widening of the field of archaeological research. It has also influenced the way aerial photographs are used in archaeology and how they are applied to solving research issues. In aerial archaeology processual inspirations (accepted more or less knowingly) have initiated dynamic and multi-faceted discussions on various aspects of the method. It seems that processual thought has substantially influenced such issues as a the concept of archaeological source (record), the problems of classification and construction of models describing the relation between cultural systems and natural environment, and the application of technological achievements. Processual ideas are also reflected in the issues connected with the protection and management of archaeological heritage.

In aerial archaeology one can see a continuation of fixed and widely accepted (in the cultural-historical approach) patterns of thinking about the aerial photograph as an archaeological source (record). Numerous publications on aerial photographs and on

their application in studies of the past treat photographs as equal to other source categories. Though being specific in the way they are acquired, aerial photographs undergo the same procedures as ceramic material found during field survey or excavations. This, however, does not prevent archaeologists from looking for distinguishing features that could help recognize archaeological features or sites in the pictures. The basic indicators were already identified by O.G.S. Crawford, Major Allen, D. Riley and J. Bradford. In the 1970s, a need arose for a more precise explanation and systematisation of phenomena that cause the appearance of cropmarks and soilmarks. There is a clear relation between this requirement and Schiffer's concept of formation processes. Among aerial archaeologists, this way of thinking could have been inspired by Schiffer's ideas though it could also have resulted from the intensification of aerial survey and the emerging research issues. It remains a fact that within the realms of aerial archaeology, site formation processes were vividly discussed. The reflection on the processes influencing the appearance of distinguishing features that help recognize archaeological features and sites on aerial photographs concentrated on three aspects: 1) role of moisture, type of soil and plant species in the process of revealing cropmarks, 2) forming of soilmarks and 3) discrepancy between research results obtained by means of different methods (aerial survey, fieldwalking survey, excavation).

The discussion on the factors forming the appearance of archaeological features through cropmarks or soilmarks and geomorphologic processes points to the growing awareness of postdepositional processes. British archaeology concentrated on the processes which had decisive importance for the formation of cropmarks and soilmarks. In American archaeology, focus was put on the processes related to natural and cultural phenomena which had an influence on the quality of archaeological material.

Classification plays a key function in research process. The way classification was understood in cultural-historical archaeology could not be accepted within the paradigm of New Archaeology. The idea of a single, unique and ultimate classification of objects and events was rejected. In fact, an archaeologist can apply many different classifications. It depends on the problems and hypotheses he puts forward.

Classification is a ubiquitous practice in aerial archaeology. While analysing aerial photographs, we have to order, group and identify cropmarks, soilmarks or shadows. Few classifications refer directly to the postulates formulated by processual archaeology. The efforts undertaken may be divided into two groups: classifications which are stages of scientific procedures or studies of the past and database classifications in institutions which are responsible for collecting and disseminating information on objects from the past.

Solutions suggested by R. Palmer, R. Whimster and D. Riley belong to the first group. In the version proposed by Palmer and Riley, there is a clearly visible tendency to build a classification for the purpose of solving a research problem. It does not differ much from traditional ways of classifying (e.g. intuitive criteria, mixture of morphologic and functional criteria) and does not aim at being universal.

The other group of classifications includes efforts at recording and ordering the vast sets of information included in aerial photograph collections and archives and making them available. For years the objects visible in the photographs have been classified according to intuitive functional and morphologic criteria. In the changing circumstances a need arose to introduce a new set of objective categories that could be used to describe new sites. The approach was necessitated by the application of computers which allow building databases and by the requirement of data standardization. In the solutions suggested for classifications of large collections there are a lot of elements postulated by processual archaeology like: objective class identification, isolation of a maximum number of features allowing for “feature relation” analyses or numerical taxonomy and the description of objects by means of metric data. The postulate that this type of classification is indeed universal does not contradict the opinion that there are no universal classifications. This type of classification remains a certain standard of constructing and managing huge databases and supplies us with pre-ordered material. It can be subjected to further classifications when addressing a particular research problem.

Processual archaeology introduced the term “model” being convinced that it could be applied as a tool in scientific explication. Models are usually idealised representations of reality. They serve as tools to present the results of observations or hypotheses.

They can also help visualise relations and structures of elements, compare states of systems, inner structure of systems, explication procedures and the construction and development of theories. Hypotheses play an important part in explication procedures. They are generated on the basis of model-formulated theories.
Archaeologists must often choose which site or part of a site is to be excavated. They have to decide what is going to be analysed and why. It is no wonder that processual archaeology stresses the importance of statistical sampling. Sampling enables a more economical disposal of resources and time in preparation and execution of research studies. Still more important is the belief that even a small fraction of a system is representative of the whole since there are many regularities within any cultural system.
The limitations of processual archaeology influenced the American attitude towards sampling to a much greater extent than the British archaeologists using aerial photographs. A correct method of distinguishing test areas in regional studies was a necessary condition for detailed analyses and allowed the results to be extrapolated on the entire area of the study. Various sampling methods were applied in different projects (e.g. Cedar Mesa Project, Lower Chaco River Project) and opened up the possibilities for so-called predictive modelling. In both sampling and predictive modelling, aerial photographs and satellite images were used mainly to identify environmental and ecological factors. In each case environmental variables were treated as independent. In this way they could be measured and used in statistical analyses and the results could be generalised. A systematic approach to culture enabled making conclusions (on the basis of environmental variables) about cultural behaviours, especially with relation to economic subsystems.
Predictive modelling was used in many different ways. To a large degree it was connected with the intensification and expansion of ground prospection. This had theoretical validity because one needed to study several sites at a time to be able to understand the intricate relations between human behaviours from the past. Efficient explanation of past cultural systems requires that one studies the relations between different places of human activity and residence at the time when the system under consideration was functioning. The process that shaped the arrangement of places of

past activity was closely related to the adaptation of the cultural system to geographical location. Thus, the spatial distribution of sites, being the remains of economic behaviours in a given geographical environment, may inform us of the organizational foundations of a past cultural system. This theoretical approach directed the research towards studies on individual settlements or camps (e.g. site catchment analyses) or settlement studies (landscape studies) in the context of environmental resources.

As in many other aspects, the application of aerial photographs by American and British processual archaeology differed substantially. R. Bewley, representing the British approach to processual archaeology, uses aerial photographs in site catchment analyses to determine the forms of ground exploitation by people from different settlements and to build a model of settlement transformations and ground exploitation methods. F. Findlow and L. Confeld (American version of processual archaeology) have tried to establish the effects of settlement pattern influence on environment close to an archaeological site by analysing LANDSAT satellite images. The conclusions of the analysis point to the differences in soil colours around sites and in places where there are no sites at all. In this way one can define the criteria past societies adopted while choosing areas for settlement.

In regional settlement studies led by American archaeologists, aerial photographs serve to identify the features of natural environment which past cultures adapted to. In the British approach to regional studies (landscape archaeology), though also inspired by processual archaeology, aerial photographs have a different function. The British approach to landscape shows that aerial photographs and pieces of information derived from them are used to build social-economic models within the system theory. This necessitates precise mapping of all archaeological features distinguished on photographs. And though archaeologists' attention was still focused on the analysis of sites in a settlement pattern, the results often showed that one should not limit the analysis to a single site. The breakthrough work by R. Palmer, Danebury. An Iron Age Hillfort in Hampshire: an aerial photographic interpretation of its environs shows the change in thinking and the transition to landscape studies. This change also brought new reflection on the role of aerial photographs in the protection and

management of archaeological heritage.
Processual inspirations has also found their way to conservation problems and, at least in some cases, they were solved by means of aerial photographs. As in other aspects of processual archaeology the American approach to the application of aerial photographs in conservation activities was different from the British one. There are multiple examples of how aerial photographs and satellite images were used in conservation projects (Chaco Canyon, Green River Basin, Cedar Mesa, San Juan Basin). Predictive models were used to plan conservation activities on vast and weakly surveyed areas. Aerial photographs and satellite images were applied to the classification of ecological zones, the choice of statistically significant test areas and map making (also as layers in GIS software). The strong relation between the concept of cultural resource management and the concept of cultural ecosystems is deeply rooted in processual archaeology.
Less visible are the relations between British archaeological heritage management and processual archaeology. They manifest themselves in different activities and concepts, though they are not unambiguously inspired by processual thought. Interesting in this respect is the discussion on classification in aerial photography. It stresses the belief that no classification is objective and correct and that classification should be problem-oriented. This concept, however, contradicts the need of data standardization, which is an obvious requirement in conservation. The issue awoke warm discussions, specifically at the time when the guidelines for the National Mapping Programme for England were being worked out. The programme is perhaps the most obvious example of the influence of processual thought on conservation policy in Britain. Projects done within the framework of the programme put into practice those postulates of processual archaeology that stressed the importance of precise spatial localisation of all observable traces of human activities. In consequence, the maps made within the programme are a splendid point of departure for all spatial analyses and processual studies on past landscape.
Reflecting on the application of aerial photographs in processual archaeology, one sees clearly that aerial photographs are slowly being removed from the sphere of interest of academic archaeology and taken over by institutions responsible for the

protection and management of archaeological heritage. The symptoms of this process were already visible in the 1960s. It can be assumed that this was mostly due to the participation of aerial archaeologists in theoretical discussions. As long as O.G.S. Crawford stayed active, the main thoughts discussed in the circles of academic archaeology were also reflected in aerial archaeology. In the 1960s, 1970s and 1980s Crawford's followers did not take up the discussion and, in turn, aerial archaeology found itself outside the mainstream of theoretical reflection. On the other hand, A Matter of Time moved the stress of the application of aerial photography towards field archaeology and conservation institutions. And theses aspects of archaeology were widely considered theoretically neutral.

The emergence of some thoughts of processual archaeology in aerial archaeology is an interesting phenomenon showing the process of enriching archaeology with new ideas and reflections without being directly connected with theoretical foundations. British aerial archaeologists of the 1970s and 1980s were not completely isolated from the world of academic archaeology where the main theoretical discussion continued. The discussion brought about numerous works written in the spirit of processual archaeology and the atmosphere within the science slowly changed gradually influencing researchers working with aerial photographs. The selective way in which processual reflection penetrated aerial photography caused new ideas, methods and solutions to develop independently of theoretical foundations. They were included in and enriched general commonsense knowledge. Consequently, publications conceived within the framework of aerial archaeology presented a mixture of ideas derived from both cultural-historical and processual archaeology. The most characteristic trait of these publications works was the application of various methods (without theoretical reflection), also derived from processual archaeology (a phenomenon specifically typical of cultural-historical archaeology). In effect, despite the application of methods borrowed from processual archaeology, the final conclusions were formulated in the spirit of traditional archaeology.

The picture of British archaeology in the 1970s and 1980s, i.e. in the period when processual archaeology was developing, is not uniform. Aerial archaeology had many "faces" at that time. The tradition of collectors and antique dealers was still continued;

there were many works closely related to the cultural-historical trend and some works and activities inspired by processual archaeology.

Processual archaeology directed researchers' attention towards theory and this must be considered its great merit. Paradoxically, it became the source of serious criticism of its main assumptions. By applying various philosophical theories born within a wide stream called postmodernism, archaeologists registered the limitations of processual archaeology. Modern theoretical and philosophical inspirations in postprocessual archaeology are so varied that they cannot be linked into a uniform theory. Postprocessual archaeologists have shown little interest in aerial archaeology. It seems however that there is a hidden potential in it which entitles it to a broader participation in scientific discussion. Postmodern thought can help us discover new layers of scientific issues and fields of study in aerial archaeology. Aerial archaeology must take a stand on the problems which are discussed by postprocessual archaeology – the questions like a picture being text, the language of aerial archaeology, and the problems of power and the concept of landscape.
In a traditional vision of the world it is undisputable that we can only believe in what we see. "Pure" visual perception is one of the canons of empiricism which is the dominating trait of positivism. In postmodern thought, however, there is a belief that what we see and what we do to perceive does not constitute part of innate and natural abilities but rather is interrelated with the methods societies shape knowledge forms, power strategies and systems of needs.
The essence of a photograph is to confirm what it is depicting. One may have an impression that photography (including aerial photography) is an ideal medium for an archaeologist. It gives a direct image of the past and, outwardly, enables direct contact with the past. But a photograph also immobilises our thinking of the past and imposes a certain framework one can hardly avoid. We must also be aware that aerial photographs are of a specific nature and they must be looked at from that perspective. It is important to stress out that aerial photographs do not (!) offer direct contact with the past understood as the reality of past societies which are studied by the archaeologist. The past recorded on the photograph is the past of air

reconnaissance, a “fixed”, historical image of soilmarks, cropmarks and shadows. The complexity of photographing processes and photograph interpretation can be looked upon from the perspective suggested by R. Barthes. A photograph may be interpreted on the phenomenological or semiotic plane. From the phenomenological point of view, the ability of a photograph to authenticate is more important than the ability to depict. A photograph is an image without codes and therefore it can be analysed on the level of perception. However, the photograph is read through codes which are culturally formed. The cultural functioning of a photograph is only possible when it has been read. This is where the semiotic plane comes in. Photographs do not include any “neutral” parts or elements which are deprived of meaning. According to J. Piaget, there is no perception without instant categorisation. A photograph is verbalised/narrativised at every stage of perception. Moreover, it is perceived through verbalisation. It means that a photograph is entangled in linguistic categories and this statement has far-reaching consequences. One has to abandon the long-lasting belief of cultural and theoretical “neutrality” of an aerial photograph. Barthes’s views point to the cultural-social context of aerial photographs. The social implications of aerial photographs are related to: (1) the stage of taking photographs (especially oblique photographs), (2) interpretation of the contents (both oblique and vertical photographs), (3) the use of photographs (or rather their contents) to address research problems, (4) the realisation of conservation policy and archaeological heritage protection programmes, and (5) dissemination of the knowledge about the past.

Aerial photographs are closely connected with text, in fact they are text. Their role as archaeological sources (record) must be redefined. There is a need to create a special language to analyse and interpret aerial photographs. This “language” is constituted socially and changes in time and cultural context. One can say that “the language of aerial archaeology” has been created since the times of Crawford. Crawford was the first to tie the changeability of phototones in photographs with the presence of archaeological sites on ground and then transformed the information onto a map. This marked the beginning of the “language” which has been undergoing constant changes since then and has been enriched with new elements. This

“language” constitutes our “reading” of the photographs.
Postprocessual archaeology has noticed the social context of the archaeologist, his/her entanglement in his/her own culture and his/her influence on the image of the past. The division between the subject and the object of study has been questioned. Archaeologists became interested in the relation between the past and their thinking of the past. Since the notion of “truth” has also been questioned one could not apply the criteria used by academic archaeology usurping the right to form the only “correct” knowledge of the past. For a recipient, the “true” image of the past is the one which is convincing and generally concurrent with his/her ideas on the past. Can aerial archaeology offer its own “alternative” version of the past? It seems plausible. As far as popular science is concerned, the output of aerial photography is considerable. The market for popular books on the past has exploded and aerial archaeology has found a niche for itself in the book trade. Aerial photographs are the most valuable elements of such books enhancing the beauty of landscape and historical monuments. They appeal to readers’ imagination. A photograph seems to convey a neutral and objective message. In addition, it represents reality and for the recipient it is the reality of past societies. As a kind of archaeological source (record), it offers metaphorical contact with past reality.

Let us conclude this review of the methods of treating aerial photographs in different trends of archaeology by answering the question of theory and method in archaeology. The examples shown so far indicate that the concept of theory and method being independent of each other must be rejected. There is a relation between theory and method and this relation is not symmetrical. Research problems are formed on the basis of theory and the problems are solved by means of different methods. Thus, theory has a major influence on the place method takes in research process. The questions we ask about method (inspired by our theoretical knowledge) also influence the answers we receive. A method introduced to archaeological studies at a certain point in time undergoes constant modifications. It becomes more “specialised” and starts “living its own life”. Still it is burdened with theory and practice it was “born” with. Many assumptions remain deeply concealed. A certain

model of interpretation is created from the very beginning and hardly ever changes. Though method (and its results) may occasionally influence theoretical assumptions, it is theory which, to a much greater extent, governs the ways and the scope of method application. Method cannot impose any theoretical approach but rather strengthen the existing attitude or help develop a new one.

It seems necessary to analyse the research process within archaeology. The process has changed through years but it has shaped some standards of practising the science which, in turn, are based on theoretical foundations (accepted more or less knowingly). An analysis of theses processes may help us understand why scientific practice has evolved the way it has evolved. It may lead to the deconstruction of existing ideas, tasks and methods and may become the basis on which new ideas, tasks and methods are formed. This can be called "metaarchaeology" – a study of the discipline, its theories, methods and objectives. Methodological selfreflection and deconstruction of existing standards are not synonymous with negation. "Metaarchaeology" may rather widen our horizons by removing limitations. We can enrich our understanding of the past by applying various trends within archaeology. Cultural-historical, processual and postprocessual archaeologies open up new fields of scientific exploration and deliver multi-faceted images of the past. Nothing should make us think about the past in the same and obligatory way. We must, however, understand the methodological and theoretical foundations which influence our research processes. This includes a careful selection of methods and adequate interpretation of data we acquire.