

Communicating Archaeology via Multimedia

Multimedia Archaeology in Goseck, Germany

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Abstract. Multimedia technology and computer networks have inaugurated a new chapter in the way archaeology is taught on a university level. Excavation training in particular is undergoing a revolution, with both practical field work and theoretical questions regarding what defines an archaeological site being affected. This paper presents a case study of a ‘multimedia excavation’ that also serves as a training ground for young archaeologists. As such, it outlines how new media can be applied to excavating, analyzing, processing and interpreting the past as well as communicating and popularising archaeology to the public. The paper discusses the project and explains why it is important for the teaching and training of 21st century archaeologists.

1. Introduction

Given the continuing financial crisis that plagues academia and the cuts to public funding, it has become pivotal to make archaeology more relevant to the public and therefore to better ‘communicate archaeology’ (Biehl 2005: 240; see also Hamilakis 2001:5). I believe the best way to popularise archaeology is via multimedia. It’s easy to learn, inexpensive, efficient, powerful and fast. The best way to start such an endeavour in archaeology is to apply multimedia in the classroom as well as in the field. And, then, our students must learn how to transport their acquired knowledge to other archaeologists *and* to the public. Yet, even as they begin to understand the potential the new tools provide for popularising archaeology, they must also be made aware of the dangers embedded in these processes (Bertemes, Biehl, Northe and Wicke in press).

The use of ‘new media’ in museums and heritage management services is currently taken for granted. Therefore, the procurement of an overall media competence in future archaeologists should already be achieved during undergraduate studies. The project that I will present in this paper is a central component of a reformed, modularised course of studies ‘prehistoric archaeology’ at Martin-Luther-University Halle-Wittenberg.

The project consists of two main parts: first, the apprentice field school of the Institute of Prehistoric Archaeology at the Martin-Luther-University (www.praehist.uni-halle.de) in which we train our students in ‘traditional’ excavation techniques by working at the Neolithic circular enclosure in Goseck. This part of the project is logistically and financially supported by the Heritage Management Service of Saxony-Anhalt (<http://www.landesmuseum-fuer-vorgeschichte-halle.de>). Second, the program contains a multimedia training component, in which we train our students to use modern, multimedia technologies to document, analyse, visualise and popularise the archaeological research we have been carrying out in Goseck since 2002. This part of the project is done in

collaboration with the ‘Multimedia Authoring Centre for Teaching in Anthropology (MACTiA)’ at the University of California at Berkeley (<http://www.mactia.berkeley.edu>) and is funded by a multimedia programme of the state of Saxony-Anhalt.

In addition to the excavation of the Neolithic circular enclosure in Goseck, the core part of the project is the introduction of multimedia hands on – that is, through working with archaeological data and the use of multimedia tools. This not only teaches students innovative ways to connect theory and practice in archaeology and ways of popularising our subject for the public, it also shows them concretely how to do so.

2. The Information Technology of the Goseck-Project

Among the many challenges to archaeological fieldwork, the design and implementation of a recording system is paramount. A good system mirrors the excavation strategy deployed at the site and is able to capture the process of archaeology and its products, the physical artefacts and the related metadata. Archaeology as practiced in the digital age creates many more ‘artefacts’ than those unearthed by traditional excavation methods. The recording system must accommodate *multi-media* in the true sense of the word – physical forms, plans, sketches, journals, slide and negative film images, video, digital stills, audio recording, 3D models, GIS data and satellite imagery (Figs. 1–3). Ideally, the system would be multi-user, multi-scalar, multilingual, cross-platform (or platform free, i.e. web-based) and built using open architecture standards to assure expandability and longevity. Of course, it would also have to conform to the low budget constraints most archaeological projects face.

There are numerous technical solutions for this, which is a common problem in database design. However, the challenge is to create a solution that does not require the end users



Fig. 1. Aerial photo of the fully excavated Neolithic circular enclosure of Goseck.

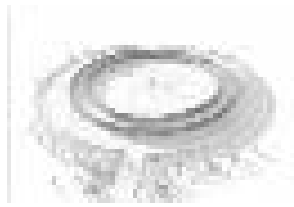


Fig. 2. Drawing with a reconstruction of the Neolithic circular enclosure of Goseck after Karol Schauer (Bertemes, Biehl, Northe and Schröder 2004).

(archaeologists) to become IT (information technology) specialists and does not require dependencies on programmers and computer scientists. It is essential that archaeologists be involved in the design process from the inception to the execution and this means the solution has to be understandable and operable by archaeologists. The database solution needs to be easily modifiable and expandable to meet the changing needs of the field, while at the same time it must be robust and stable enough to sustain scrutiny from a worldwide user base.

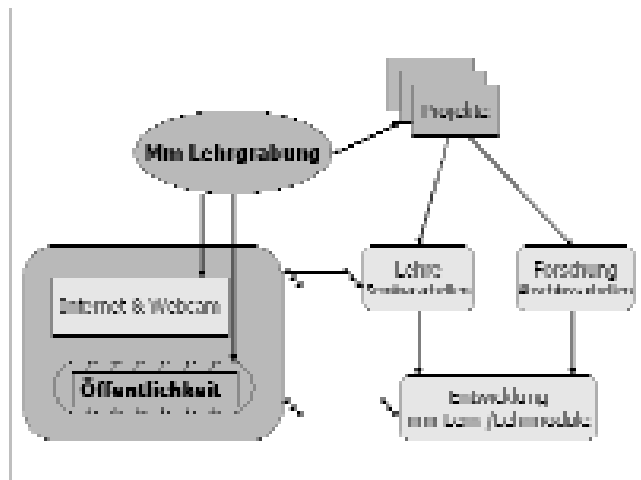


Fig. 3. Diagram showing the application of multimedia in teaching and research in archaeology.

In the project ‘Multimedia Archaeology’ we use an integrated digital data management system that is well-suited to the special requirements of archaeological fieldwork, while providing real-time reporting to the international audience via the world-wide-web. The essential data is entered in the field directly into ‘off-line’ PDA (portable data assistant, e.g. Palm or Pocket PC) devices and uploaded throughout the day into the centralized database located at the dig house (Fig. 4). Paper records are not replaced. On the contrary, the process of entering the data from the paper records into the PDA provides a vital cross-check that the field records are complete and accurate. We do this through verification processes built into the digital database. By moving the entry process to the field and excavation, we can give the excavating students feedback dynamically in real-time. The benefits of such feedback are immediate and clear. Because every field document is tracked in one integrated data system, we can dramatically reduce the risk that an archaeological feature is not adequately recorded, as well as the potential for wasted time and effort through redundancy or over-recording. During lab time, data entry is completed on networked PCs and laptops in a database. Several validation steps are in place to assure data integrity, culminating in a complete and accurate digital record. To accommodate the realities of time constraints in the field and the overwhelming amount of data entry if all of the data from the field notes were entered, the database serves as a retrieval system. Notes, forms, plans and sketches are scanned and given ID numbers so that the ‘analogue’ documents remain intact and data entry is manageable.

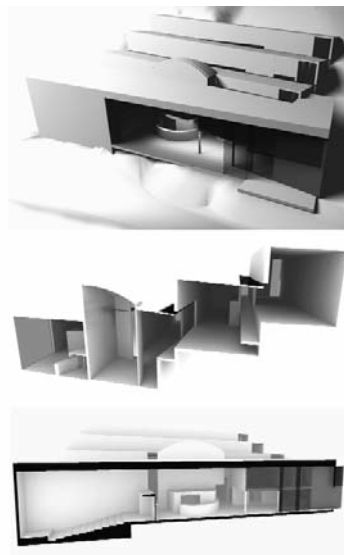


Fig. 4. Multimedia in photo documentation.

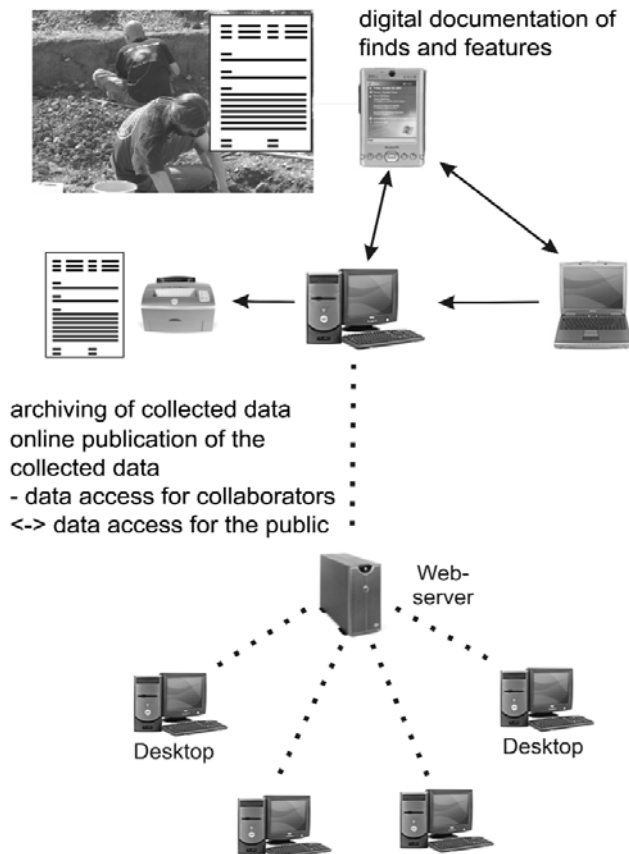


Fig. 5. Multimedia in archaeological excavation documentation.

This process is identical for all other forms of documentation, digital or physical. Digital photos are downloaded to a PC, catalogued, annotated in the database and archived onto CDs/DVDs. Screen-resolution preview images are stored on the server and are accessible directly through the database. Digital video is digitized, viewed for content, annotated and archived into the same media database. Digital drawings of profiles, plans and features and other ‘digital originals’ are safeguarded through password protection and non-modifiable instances are made available for general use. The process of making the record of the archaeological process available at this level of detail provides a wonderful opportunity for in-field analysis and collaborative work while functioning as a buffer between the users and the primary documents by reducing the need for multiple interactions with the originals. What has been described so far is a digital accession system for the physical and virtual artefacts excavated or created by archaeologists in a field season. But in order to move between present and past – analysis, interpretation and visualization of the archaeological record – we must also transport the past into the present, e.g. make our work understandable and sizable for the public.

3. The Archaeology of the Goseck-Project

The circular enclosure of Goseck belongs to the so-called *Kreisgrabenanlagen* – circular enclosures – of the Central European Middle Neolithic of the first half of the fifth millennium BC. Although the C-14 dates are still under

examination, the site can be dated after a first analysis of its material culture to the beginning of the fifth millennium (4900–4700 BC). In the regional relative chronology, it belongs to the so-called Middle Neolithic *Stichbandkeramik* or culture with Stroke-Ornamented Pottery (Kaufmann 1976). Up to now, we know of approximately 120 circular enclosures belonging to the Middle Neolithic in a circumscribed area reaching from Slovakia and Hungary in the East to Bavaria in the South and Hesse and Brandenburg in the West and North (Neubauer and Trnka 2005: 4).

Goseck serves well to introduce the Middle Neolithic variant of enclosed sites in Central Europe since it was built and used during the two centuries in which this type of enclosures suddenly emerged and then abruptly disappeared again. Like most enclosures of this time period, it is situated on a slightly sloped loess-covered terrace in an open, un-wooded landscape close to a spring and a river (Fig. 5). Like so many discoveries in countries of the former Eastern Bloc, the site was first discovered in 1991 when intensive aerial photography that was prohibited until 1989 was done (Schwarz 2003). After its discovery, it was analysed and documented with a geophysical survey, which took place in 1995 (Volker 2002).

In 2002, we started to excavate the site in collaboration with the Heritage Management Service of Saxony-Anhalt and the Department of Anthropology of the University of California Berkeley.

The excavation was envisioned within the framework of an apprentice field school and had three main objectives: First, we wanted to fully excavate the site to come closer to an interpretation of the function and meaning of it. Secondly, we wanted to contextualise the enclosure, settlement, cemetery and other monuments of this time period in their landscape to better understand the lives of early agriculturalists in the Goseck region. And thirdly, to train archaeology students in traditional excavation methods – including the use of a Total Station, GPS and GIS applications – and digital documentation methods – photo and video. The complete publication of the site and its analysis and interpretation will be a part of my *Habilitation* – state doctorate – which is planned to be submitted in 2006 at the Martin-Luther-University (Biehl in preparation).

The enclosure consisted of a circular ditch over 70 meters in diameter, furnished with three entrances with out-turned terminals and with traces of two wooden palisade rings inside it, each with a narrow in-turned entrance which exactly lined up with the ditch entrances (Fig. 6). The ditch in Goseck was some 3 m wide, and its V-shaped section reached most likely over 3 m and narrows at its bottom to 30 cm (Bertemes, Biehl, Northe and Schröder 2004). It had an earth bank in front of the ditch, which we were able to document in the profile and the filling of the ditch. The V-shaped ditch silted up quickly by natural erosion of the loess and was cleaned out and re-cut several times. The upper part of the profiles of the ditch shows a darker and more homogeneous layer and the building of humus indicates that the ditch was open and unused over a longer period of time. We still don’t know just how long this period was, but it may simply have been as long as the construction – that is, the wooden parts – endured. There is no evidence that parts were fixed or renewed.

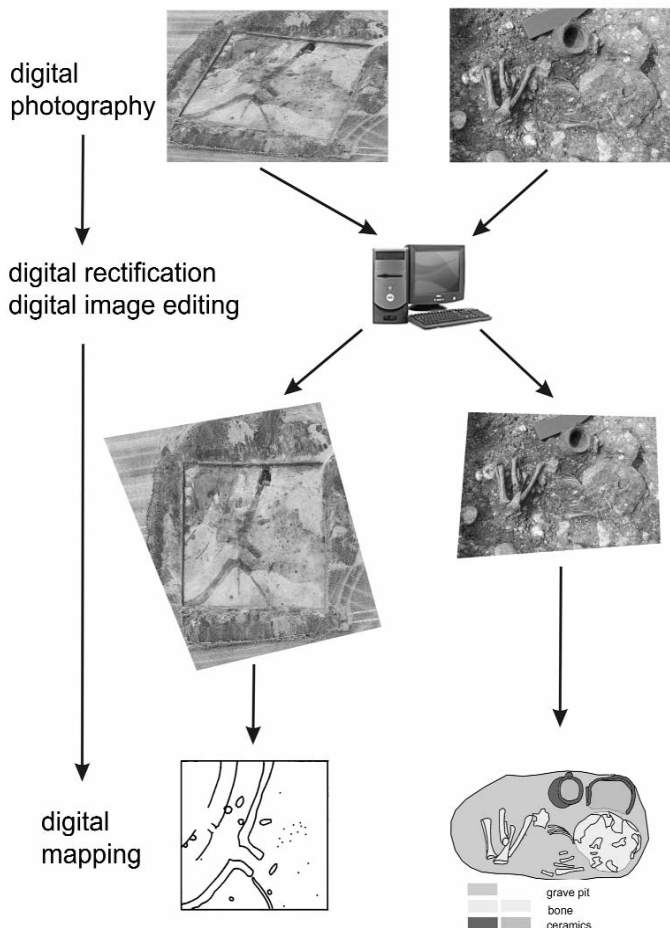


Fig. 6. Multimedia in video documentation.

We have found no evidence of structures inside the enclosure. Some contemporary pits may have been connected close to the eastern and western entrances – both inside and outside – with special depositions. Three of them outside the western entrance had calcined walls and floors indicating fires. Interestingly, they seem to have been thoroughly cleaned out after usage so that there are no remains of the fire nor any artefacts. Even more interestingly is to note that the pits contained human bones. Two other larger pits at the western entrance to the enclosure also have calcined walls and floors, which indicate that fires burnt here as well. These pits did not contain human bones but a thick layer of ashes with pieces of charcoal and shards of stroke-ornamented pottery. We can, therefore, assume that these pits were used for some sort of action – possibly, given the deposition of human bones – some sort of ritual action. But conclusion about their functions as well as their exact chronological relationship to the enclosure has to await the complete analysis of the site, including the soil samples and material culture.

Again, aside from the palisades there are no architectural remains within the enclosure. There was, however, something else very interesting – a special type of a burial found in the inner southeast area of the enclosure. Here, parts of an adult skeleton were deposited together with two flint arrow-heads and clots of ochre. This discovery is not only fascinating in terms of the question of ritual actions that might have taken place inside the enclosure, but also because it can help date the enclosure and its relative chronology: The burial has been

cut by the outer palisade. Of course, before we can make hasty conclusions about the site and the relationship of this burial to the enclosure, the whole site has to be studied in context. Still, it looks very much like the skeleton was knowingly deposited there before or in the course of the construction of the circular enclosure with double palisades. Similar deposition of human bodies or body parts are known for example from Friebritz in Lower Austria and Ippesheim in Hesse (Neugebauer-Maresch 2005; Schier 2005).

Interestingly, finds such as pottery and stone tools were deposited only in the entrance area in the South. The same is true for animal bones, most of which come from cattle.

At the end of this short description, I would like to quickly mention three other interesting discoveries: Outside of the enclosure, we found a grave of a 1–2 year old child with two pots of the Linear Pottery Culture. Also outside the enclosure, we surveyed and partly excavated a longhouse from the Early Bronze Age. Both features show that this place was occupied long before and long after the enclosure was built and used. Finally, there are small ditches leading towards the enclosure. One of the 30–50 cm wide and 20–40 cm deep ditches has been partly excavated, but since it did not contain any archaeological remains we still don't know its relationship to the enclosure. We are planning further surveys and excavations to clarify the important question of what function they served.

In regard to its functions and meaning, I firmly believe that these enclosures were used as places for ritual and cult practice (Biehl in preparation). To me, the evidence is overwhelming both in terms of material culture and in interpretive possibility.

If we look at Neolithic enclosures across Europe, we find a fundamental similarity: all the sites enclose space. Their perimeters separate the outside from the inside. Certainly, many of these sites had earlier activity in the area so the places may already have been important before the construction of the more visible monuments. These perimeters serve to restrict and proscribe entry. They can only be accessed through the formal entrances; routes of admission which the architects carefully delineated. Nothing was random. Some enclosures were also clearly built in order to carry out remarkably advanced solar observations. This immediately implies an element of control – or a desire for control. As the inside is differentiated from the outside, so those within could permit, deny or restrict access to those without. This differentiation of space reflects, even at a basic level, I believe, social stratification. It represents a class possessing power, authority, knowledge or some sort of mystic power set aside from the rest of society. Those with power may have had a perceived ability to communicate on behalf of the community with the 'other-world.' Another important function within this space was marking time – be it solar or temporal. I want to stress the *multi-scalar nature* of place and the broader context of power relations and social structures within which place is not only the product of human practices and experience, but also the arena through which they emerge.

Clearly, these monuments reflect the societies they served and by which they were constructed. Furthermore, the enclosures

are communal and clearly entailed a great amount of people and effort to build. As such, it was not only the use of these places that united a society, but it was also building them. If we as archaeologists think excavating is tough, just imagine the groups assigned to digging these original ditches, building the banks, cutting trees, transporting wood and erecting palisades. Such group work would have given a community a sense of identity, a feeling of purpose and perhaps most importantly, a series of memories. These memories served an astonishing purpose: they connected people to a place and began the process of tying them personally and irrevocably to its functions and histories.

Communicating Archaeology

The students are not only trained to use multimedia in the process of the excavation and documentation of archaeological data but also ‘to tell their story’ of the excavation, the site and its possible meanings and functions in the past (Fig. 7). In small projects in the classroom as well as during the apprentice field school, they learn to use multimedia tools to present their interpretations and to visualise them in 3-D reconstructions. They also learn to build and administrate websites and to use the Goseck-website to popularise the site via the world-wide-

web. In order to include the public in the project, the students are trained to give tours of the site to visitors and to interview the local people about their conception of the past of the Goseck enclosure. These videos are put on the website to assure some sort of *multi-vocality* and have proven to be a good means to popularise the site and its archaeology on the one hand, and to help generate a better understanding of it in the public (Biehl/Gramsch 2002).

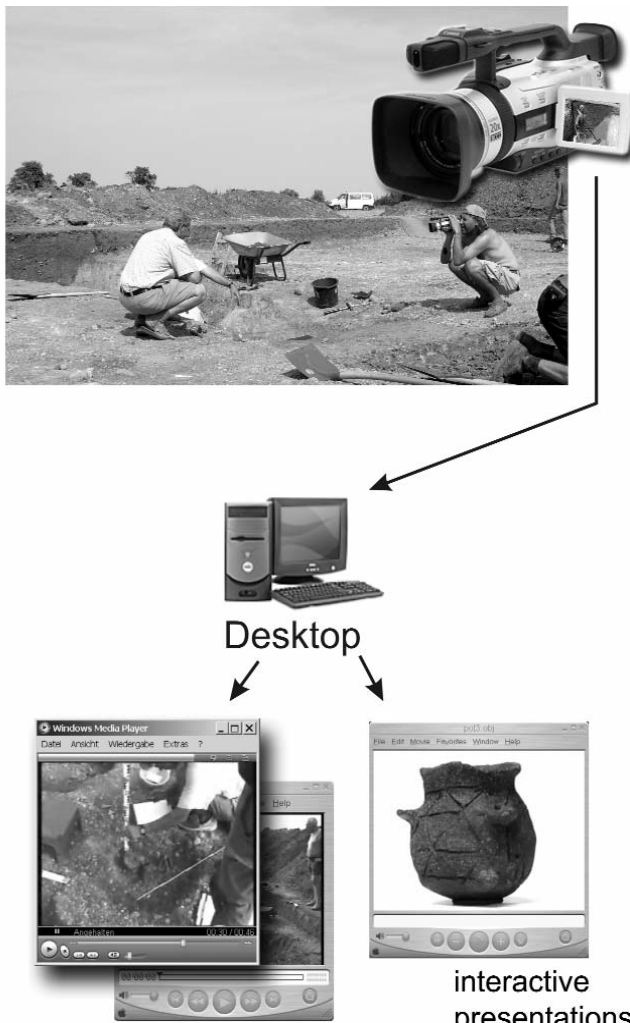
The website is build as an ‘*open knowledge*’ source that offers information to the interested public without any previous knowledge and to archaeologists alike (www.praehist.uni-halle.de/goseck.html). It consists of differentiated levels of information ranging from short introductory texts written in a popular, scientific manner combined with photos and videos to detailed descriptions and illustrations of the archaeological data. Though all levels are accessible – which guarantees a general transparency – only the ‘deeper’ levels of the website maintain a ‘scientific standard’ acceptable by archaeological publications, and provide the archaeologist-user with information about the excavated artefacts and their contexts, i.e. plans, photos, videos descriptions of finds and findings.

But due to hypermedia, all information on the website is interconnected and can be approached in a multi-linear way. Elsewhere I have discussed the enormous epistemological potential of hypermedia for archaeology (Biehl 2003). Rather than following the author’s linear argumentation in traditional forms of publication, such as books and journal articles, the readers/users of the Goseck website can browse through the information in a non-linear way, and approach the data the way that best suits them (Biehl 2002, 2005). Another advantage is that all data can be made available, which is normally not possible in traditional publications due to financial reasons. All users can access all data regarding the excavation at any time. Still, in practice, it’s the virtual reality objects that enjoy great popularity (see also Rieche/Schneider 2002, Samida 2004). But such modern presentation forms of artefacts are not only interesting for the public but also for archaeologists who can view and analyse artefacts more ‘closely’.

This is only one example of how multimedia tools can change the practice of archaeology, and there are many more. It is important to note that the fact that the layperson *and* the professional archaeologist can both access the data from the Goseck excavation creates a new form of ‘knowledge transfer’ both within the community of archaeologists and also to the public.

In addition to the website, the world-wide-web offers another possibility to popularise archaeology and to include the public in it: Web-cams. In Goseck, we transmit the archaeological excavation via a web-cam live on the world-wide-web (Figs. 8–9). The user can ‘look over the student’s shoulder’ and quasi participate in their archaeological training. The user can also learn about the daily work of an archaeologist and see the first results of the excavation on the website. Naturally, the site on which the web-cam runs can easily be used for sponsoring which becomes more and more important for the financing of archaeological research.

Communicating archaeology with interactive websites and live web-cams can help us to make archaeology understandable, sizable and interesting for the public.



digital video-archive and handbook

Fig. 7. Multimedia in digital reconstructions and visualizations.

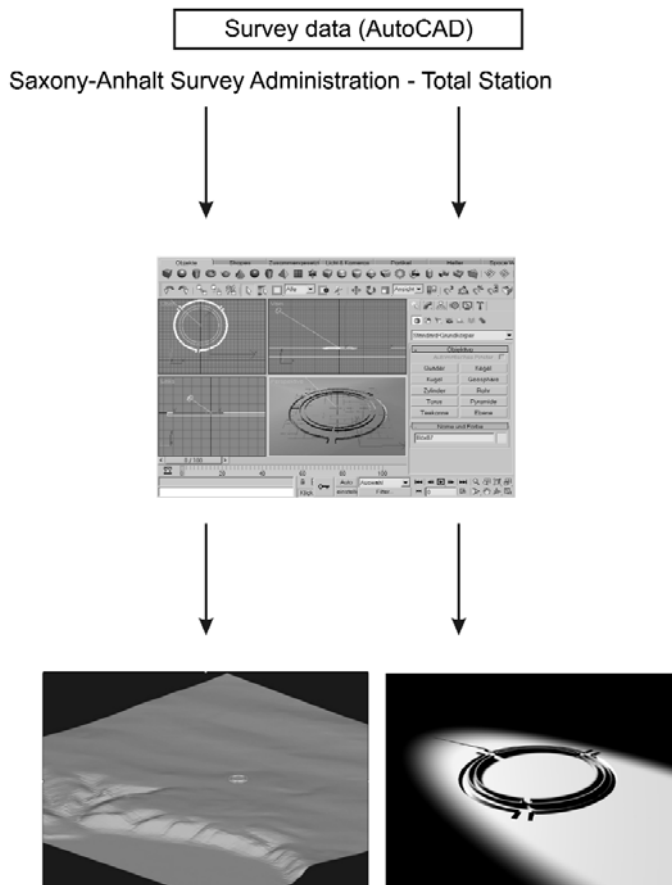


Fig. 8. Multimedia in public relations (PR): Videostreaming.

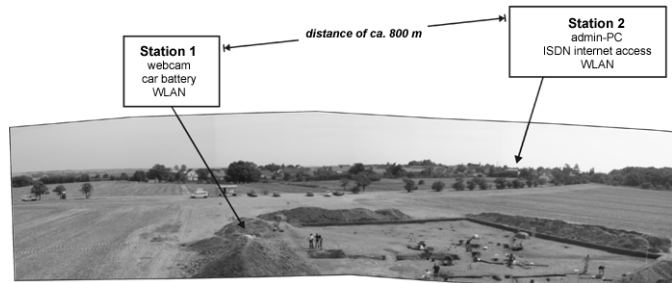


Fig. 9. Practical application on site.

Of course, one of the most exciting parts about working on archaeological monuments is envisioning how we might ‘rebuild’ them. This is dicey and often dangerous work that sometimes borders on the theatrical. Particularly when the public or the media imagination gets stirred. In Goseck, for example, media hype and tremendous public interest have been boosted by the Bronze Age sky disk of Nebra – a glorious depiction of the moon and celestial bodies, which was found about 25 kilometers north of Goseck (Meller 2004). With the find, the archaeo-astronomic interpretation of Goseck intensified to such a frenzy that our careful scientific explanations of the site almost became overshadowed by free-wheeling media hype over what the site might have been. This is all very dangerous, detrimental and often misleading. However, recently, we were able to celebrate the laying of the corner stone of what will be the reconstruction of Goseck’s circular enclosure (Fig. 10). The reconstruction will stand in its original place and hopefully will serve as a means of



Fig. 10. Model showing the real’ reconstruction of the circular enclosure on site with an information point (Bertemes, Biehl, Northe & Wicke in press).

bringing us closer to understanding how it functioned. It could also be a means of achieving the terribly difficult yet pivotal archaeological goal – interesting the public in prehistory. Of course, the opposite danger is also there – that this – a carefully excavated Neolithic enclosure – will, because of its extraordinary imaginative potential, be usurped by the public and the media and transformed into a sort of archaeological Disneyland. In such a sad case, much of the site’s meaning and context would be lost in the public’s hunger for easy understanding. Although these dangers of this appealing but ultimately archaeologically destructive impulse should not be underestimated, the potentials of the popularisation of archaeology clearly countervail them: the dramatic budget cuts for teaching and research in most European countries forces us to work hard to better ‘communicate archaeology’ to the public. The public has to understand why it should spend tax money on archaeological research. I believe that multimedia offers us and our students powerful tools to accept and meet this challenge. As such, I believe it is pivotal for the teaching and training of 21st century archaeologists.

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