Paper, Video, Internet: New Technologies for Research and Teaching in Archaeology: The Sphakia Survey

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Abstract:

Archaeology has always been a multimedia discipline in terms of teaching and publication. From the earliest days of archaeology as an academic subject, archaeologists have used museum collections, slides, and actual site visits as well as 'chalk and talk' for teaching. Archaeological publications are almost always illustrated.

The Sphakia Survey is an interdisciplinary archaeological project whose main objective is to reconstruct the sequence of human activity in a remote and rugged part of Crete (Greece), from ca 3000 BC to AD 1900. In addition to preliminary reports, we have published specialised articles on paper, and part of the final publication will also be in hard copy. But in order to reach other, broader audiences, we have used two other modes of publication. In 1995 we produced a video, which was intended for university teaching; it has also been useful as another kind of preliminary publication. In 2000 we launched a website, The Sphakia Survey: Internet Edition[1]. The website, which is part of our final publication, has enabled us to make our work known to other constituencies, as well as to scholars.

Most recently we developed an online course, Archaeology for Amateurs: The Mysteries of Crete[2], which builds on the Survey website. It introduces students to archaeology in general and to the archaeology of Crete in particular; it can be accessed by anyone with an Oxford e-mail address.

This paper examines the impact of video and the Internet on the work of the Survey. It concludes that these new technologies add new opportunities, though not always those that one might expect; and that they make it possible to do things better, in connection with research, teaching, and dissemination of results, both to academic and to general audiences.

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[2] *Archaeology for Amateurs: The Mysteries of Crete (accessible only if you have an Oxford University email address): http://crete.classics.ox.ac.uk*

Keywords: Archaeology, teaching,   multimedia,   publishing.

Interactive Demonstration:
Links to external web sites.

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1.   Introduction

Figure 1. The new village of Ayia Rouméli stands at the mouth of the Samariá Gorge. The coastal slopes are very arid, but the mountains behind are wooded with pines and cypresses. Towering above is the dazzling white limestone peak of Zaranoképhala (2140 m).

Archaeology has always been a multimedia discipline in terms of teaching and publication. From the earliest days of archaeology as an academic subject, archaeologists have used museum collections, slides, and actual site visits as well as 'chalk and talk' for teaching. Archaeological publications are almost always illustrated.

The technologies that we discuss in this paper are video and the world-wide web, and the archaeological project that they relate to is the Sphakia Survey, which Nixon co-directs with Jennifer Moody[1]. We begin by introducing the Survey and its publication programme, and then go on to the issues arising from our use of these two technologies. The technologies are not new in one sense, but their full integration with paper publication remains novel. At the end of the article we summarize our views on the various opportunities that reporting and publishing on video and the web have given us.

The objective of the Sphakia Survey is to investigate how humans have interacted with this rugged landscape since people first arrived ca 3000 B.C. until the end of the Turkish period in ca A.D. 1900. Sphakia is an administrative district (formerly eparchy, now deme) in southwestern Crete covering some 472 square km. It is a rugged area with considerable altitudinal compression: in only 16 km, the landscape changes from palm trees on the coast to elevations of ca. 2,400 m at the top of the

White Mountains, where there is snow even in summer. The area is dissected by about 12 gorges running south to the Libyan Sea, of which the most famous is the Samaria Gorge. Members of the Sphakia Survey worked at every elevation and in every environmental zone. We selected areas for investigation on a stratified random basis and transected sets of quarter kilometer squares. We walked line transects where such squares were impractical (gorges, mountaintops), engaged in focused extensive exploration, and revisited all the sites. This fieldwork revealed 315 sites spanning 5,000 years, which we have divided into three major epochs (Prehistoric, Graeco-Roman, and Byzantine-Venetian-Turkish).

From the beginning, the Sphakia Survey aimed to collect and synthesize all possible types of evidence. Data were categorized in four groups: environmental (e.g., pollen cores, taxonomic botany, land use, climate); archaeological (sherds, stone tools, coins, bone, metal objects, glass, building remains, and standing structures); documentary (ancient and later inscriptions; Byzantine, Venetian, and Ottoman manuscripts and texts; written sources, both prose and poetry, pertaining to Crete); and anthropological (for examples, interviews with local people). After an exploratory pilot season in 1986, fieldwork was conducted from 1987 to 1992. Analysis of finds began in 1989 and continued until 1998 in conjunction with other specialist work.

2.   Paper

Figure 2. The Agiasmatsi cave, marked by large carob tree in centre left of image. We wrote an article about the ancient religious uses of this cave.

When we began work in Sphakia in 1987, we thought of publication only in terms

of paper. We knew we were going to be using databases, but we thought of them as a tool for our own analysis, not as something to be shared with any kind of audience, even an academic one. Thus it was the results of the analysis which we initially wanted to share, not the data on which the analysis was based. The advent of the web meant that it was possible to share access to datasets freely and conveniently. At the same time, such sharing began to seem desirable. This was partly because at that time the web did not exist as a medium for the sharing of access to datasets.

We also thought it would be impossible to publish large numbers of illustrations in colour, and so we thought it best to do all site and object photographs in black and white, with only a selection in colour. Our plan was to begin with preliminary reports, and in the end to produce a final publication which would include analytical chapters, the site gazetteer, and catalogues of finds.

Our paper publications did indeed begin with three brief preliminary reports covering all aspects of the Survey's fieldwork. At the time, in the late 1980s, surveys did not routinely publish preliminary reports, nor had many surveys published final reports by then. The publication of a conference held in 1981 had included short summaries of many archaeological surveys in the Mediterranean. A volume publishing a survey on the island of Melos (Renfrew and Wagstaff, 1982) had appeared with the actual survey results compressed to a short section at the end, and that was about it. The Northern Kea survey (Cherry, Davis, and Mantzourani 1991), set a very high standard but was a project dealing with a much smaller area than our own. So we were to some extent working in the dark in terms of norms for survey publication.

Since then we have also published or prepared a number of specialized papers relevant to the three major epochs of the project. These papers have been useful, both as stand-alone articles, and as a way of processing and analysing our material in preparation for the final publication. The topics covered and types of evidence deployed are highly disparate, and give a good idea of what diachronic projects such as ours must deal with, in terms of publication (listed in the bibliography of this article, and in some cases republished online[3].

If things had gone according to our original publication plan, we would have finished our work with a single big book, and that, including the three preliminary reports and the addition of these specialized articles would have been that. In so doing we would have done everything to fulfill our academic obligation to publish.

[3] *Sphakia publications: http://sphakia.classics.ox.ac.uk/publications.html*

But there was another kind of publication that we were involved in from the earliest stages, and that was reporting to general audiences, both in Canada and in Greece. We wrote short articles for the *Bulletin of the Canadian Mediterranean Institute*, and we also produced an article published in *Khaniotika Nea* (Khania News), one of the newspapers published in the nome or prefecture of Khania in western Crete. The latter attracted a very favourable response from people in Sphakia, with whom we had always spoken about our work, and to whom we had always shown our finds. Later we did an interview for *Ta Sphakia*, a bimonthly newspaper for Sphakiotes everywhere, in Crete, in Greece, and abroad, which was also well received. One of the subheads for the interview was   "What have foreign archaeologists found in our area?" (Ti vrikan ston topo mas i xeni arkheologi;).

It was clear that there are several different kinds of general audiences, in Canada, in the U.K. , and in Greece, and that these different audiences have different agendas; these issues became even clearer when we made a video about our work.

3.   Video

Figure 3. Charles Beesley and Karen Watts filming in the Samaria Gorge.

Soon   after we began to work in Sphakia, we began to include Survey material in our

teaching. Most of Nixon's students in Canada, at Queen's and later at the University of New Brunswick at Saint John, had never seen any Mediterranean landscape, and still images did not seem to be able to show them what the terrain of Sphakia was like. Still images are in general less satisfactory for conveying an accurate sense of a particular landscape, but especially so for people who have never had the opportunity of seeing that landscape for themselves. Nixon thought that moving images would help, because of a video made by the anthropologist Jane Cowan, who had been working in northern Greece, and shown at the Canadian Archaeological Institute in Athens when she was Assistant Director there (for a profile of Jane Cowan see[4]; cf. Cowan, 1990). Even in black and white on a tiny monitor, Cowan's video showed clearly that the landscape of Greece was stark, beautiful, and above all, inhabited and used by people. One thing led to another, and the end result was that we made a 50-minute video about the Sphakia Survey, working with Charles Beesley and Karen Watts of the Educational Technology Resources Centre in Oxford. The process of collaboration was highly enjoyable, and we remain most grateful to them. For more details, including a clip of the video, see[5].

What we thought we were doing was making a video for use in university classes in Canada and also the U.S. We found that it had other unexpected and very positive uses as well. We had begun serious work on the video during the 1992 study season, but had not finished editing it. That fall we persuaded the Canadian Broadcasting Corporation (CBC), the national television network in Canada, to show some of the video on the CBC News for New Brunswick. In the end they made a 7 minute feature which included not only a clip from the Survey material, but also footage from one of Nixon's classes on the archaeology of Greece, and an interview with Nixon in which she said how important public funding for our research was. The feature was broadcast late in 1992.

The reaction of the students was predictable: they loved being part of a television programme. The reaction of our colleagues and neighbours in Saint John was less so. Before the telecast, their attitudes to my work were often rather ambivalent -- archaeology was clearly exciting, but in this case involved public money being spent outside Canada on something remote in time, space, and perceived relevance. After the broadcast, they were happily enthusiastic about the project, and proud that Canadians were doing such work. The telecast had somehow given them a connection to the project.

[4] *Jane Cowan: http://www.sussex.ac.uk/anthropology/profile592.html*

[5] *Video about the Sphakia Survey: http://sphakia.classics.ox.ac.uk/video.html*

The video was finished in 1995, and we showed it to members of the Khania Ephoreia (local office of the Greek Archaeological Service) that summer, as well as to colleagues in Oxford. The senior Greek archaeologists who saw it were on the whole pleased and intrigued. Then we decided that we should show it to people in Sphakia. In 1996 it was shown twice on national television in Greece, with Greek subtitles. We are most grateful to Katerina Boura, former first Secretary, Greek Embassy, London, for contacting the national television network of Greece on our behalf; and to Elpida Protopappa at ET2, the cultural channel of Greek national television, for arranging enthusiastically for the screening of the video in Greece and for subtitling it in Greek.

The film had to be shown on national television because the local cable channels on Crete, which are on the north coast, did not have signals strong enough to cross the White Mountains and reach Sphakiote televisions. People in Sphakia were extremely pleased to see the video, which made it possible for people to assess our project for themselves. They also liked the video because it revealed a serious, dignified local archaeological past, while providing an unsensational view of themselves and their economy. We gave people their own copies, as VCRs are now more common in Sphakia than they were when we began fieldwork in 1987.

We made the video for teaching in universities, and it has been useful in that context (cf. Bennet 1996, Hamilakis 1997 and Mee 1999). Academic reviewers' appreciation of the video varied directly with its perceived usefulness to their teaching; their notions of what constituted 'relevant' footage depended on their own point of view. We might, however, note one technical impediment to its class room use: most rooms are not set up for audio-visual displays, and making special arrangements with technicians is time-consuming and not always effective.

But there were several surprises connected with the video and its reception. The first was that it became a very effective way of reporting to general audiences, both in Canada, through the CBC broadcast, and in Greece, through their national television network. The second surprise was how very important it clearly is for academics to find ways of reaching and reporting to general audiences, particularly when their research is funded with public money. The third surprise was that Nixon (2001a) ended up writing a specialized article assessing these issues, which was the last thing she imagined she would be doing when we shot the first footage in 1988.
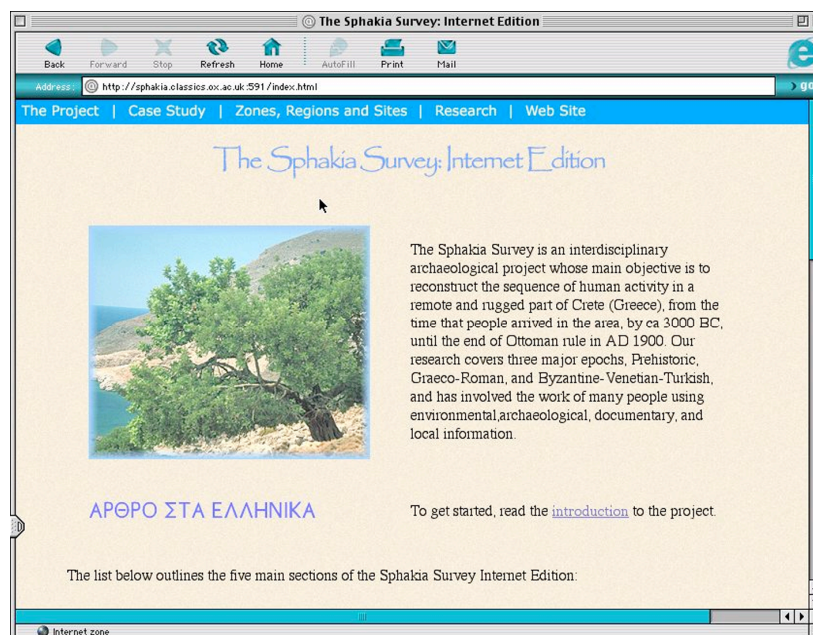
4.   Website

Figure 4. Sphakia Survey Website.

The Sphakia Survey website was launched on 27 October 2000. The Sphakia Survey: Internet Edition[1] provides general information about the project; and presents some 1,100 colour images of pottery fabrics; landscapes and sites; botanical and environmental views; additional pottery and finds drawings, and interactive databases, including a searchable database for the Site Catalogue. The website also includes an article in Greek introducing the Survey, a brief summary of the project, a list of publications, complete text of the three preliminary reports, and clips from the Survey video. Finally, it includes a teaching case study based on one of the survey regions, the Frangokastello area, with a searchable database for this region for the Graeco-Roman period.

Construction of the Sphakia Survey website began in 1999 with assistance and funding from the Humanities Computing Development Team at Oxford University's Computing Service. We did most of the archaeological work on it, while Sarah Porter and Sophie Clarke of the Humanities Computing Development Unit, Oxford University, now the Academic Computing Development Team[6]. Together the four of

[6] *Oxford University Academic Computing Development Team: http://www.oucs.ox.ac.uk/acdt*

us did the design work.   We also had crucial help from Jennifer Moody and Oliver Rackham.

For the Sphakia Survey website, the FileMaker Pro databases are interfaced to the web using Claris Dynamic Markup Language (CDML) to produce output in HTML. Javascript is used for other dynamic parts of the site. Debi Harlan did the fundamental work on the various databases, which were needed for both parts of the final publication, paper as well as electronic.

As we see it, the website has three functions. First, it is part of the final academic publication of the project. It includes a far greater number of images, nearly all in colour, than a paper publication could ever provide. Just to mention one particularly important use of these images: the close-ups of pottery fabrics make it possible for ceramic experts to see immediately whether or not their material is similar to our own. The interactive databases can be used for diachronic comparisons, and, once the right technology is in place, will be cross-searchable, along with other websites. The current website represents the first phase; more material will be added at a later date.

The paper publication, now in preparation, includes the analytical text and a gazetteer of 315 sites located and studied by the project. But the website does things that the two-volume paper publication couldn't do: in other words, the website is complementary to the paper publication, and together they constitute the final publication of the Sphakia Survey. In this it had precedent in the websites for other archaeological field surveys in Greece: the Nemea Valley Archaeological Project Archaeological Survey[7] and the Pylos Regional Archaeological Project[8].

Second, the website can be used in teaching, through a special teaching section[9]. It can introduce students to archaeological databases, both through the case study and through more advanced searches. Through the colour images, the website can show students what different environmental zones and plants in Sphakia actually look like; and the same for the finds. Indeed, we have found that together the video and the website make a very powerful combination. We shall return shortly to the question of teaching.

Third, the website enables us to report directly to general audiences (including in

[7] *Nemea Valley Archaeological Project Archaeological Survey: http://river.blg.uc.edu/nvap/*

[8] *Pylos Regional Archaeological Project: http://classics.uc.edu/prap/*

[9] *Sphakia website teaching section: http://sphakia.classics.ox.ac.uk/teaching.html*

Greece, partly through republication of the Greek-language interview with us). This general reporting is increasingly important in archaeology, both in the countries where fieldwork is done and in the home country of the archaeologists involved. We must add immediately that these functions are what we thought the website was for. Time will show us what its actual use has been. We are keen to get feedback on the website and are happy to receive comments on it.

There are already two important issues that arise from electronic publication. One is cost. Websites are expensive to design, and also to maintain. At the moment, most academic sites on the Internet are freely accessible to all. This free access may have to change. But it may be that charges for on-line courses, such as the Crete course to be discussed below, will provide enough income to academic institutions to maintain websites and other electronic resources, just as tuition fees for conventional courses provide the funding for libraries now. (This is of course a vastly oversimplified view of university finances, but we include it to show that there are already models for funding academic resources.)

Another issue is the standing of electronic publications in terms of satisfying tenure requirements and research assessments. Many academics who create and use electronic resources feel that their efforts are not taken seriously enough by those assessing their teaching and research performance. The (American) Chronicle of Higher Education carried a long article on this very issue on 22 February 2002 (Jeffrey R. Young, 'Ever so slowly, colleges start to count work with technology in tenure decisions'). The website for the Ancient Studies New Technology Conference 2002[10], held at Rutgers University in the U.S., explicitly outlines some of the current debates (and includes abstracts and some presentations). The Professional Matters Division of the American Philological Association (the national body in the U.S. for university classicists) in 2003 was 'gathering information about the current role played by electronic publishing in the tenure and promotion processes for classicists' prior to a forum on this subject in January 2004[11]; the results of the forum will be published electronically on the APA website[12] and in print in Syllecta Classica (16, 2005).

[10] *Ancient Studies New Technology Conference 2002:*
http://tabula.rutgers.edu/conferences/ancient_studies2002/

[11] *American Philological Association, Electronic Publishing and the Classics Profession questionnaire: http://www.stoa.org/apa/*

[12] *American Philological Association: http://www.apaclassics.org/)*

We ourselves had tremendous difficulties, both conceptual and technical, in submitting the Sphakia Survey website as an academic publication for the U.K. Research Assessment Exercise in 2000. It was suggested at one point that we simply print out the whole Sphakia Survey website and submit the print outs. We could not do this, because the website includes interactive databases; printing out would have destroyed their functionality, along with all the links between images, pottery lists, site descriptions, etc. Fortunately, the RAE concern whether all of the current website had been 'published' by the RAE deadline could be resolved in another way. We submitted as back-up evidence a CD-ROM, plus a detailed list of changes made to the site after 31 December 2000. But this solution was accepted by the RAE authorities only one month before the final deadline for all submissions. In the end our website was accepted as an academic publication on a par with paper publications. But the whole episode illustrates the fact that there are many issues relating to electronic resources which have yet to be properly understood and integrated into academic life.

5.   Online Course
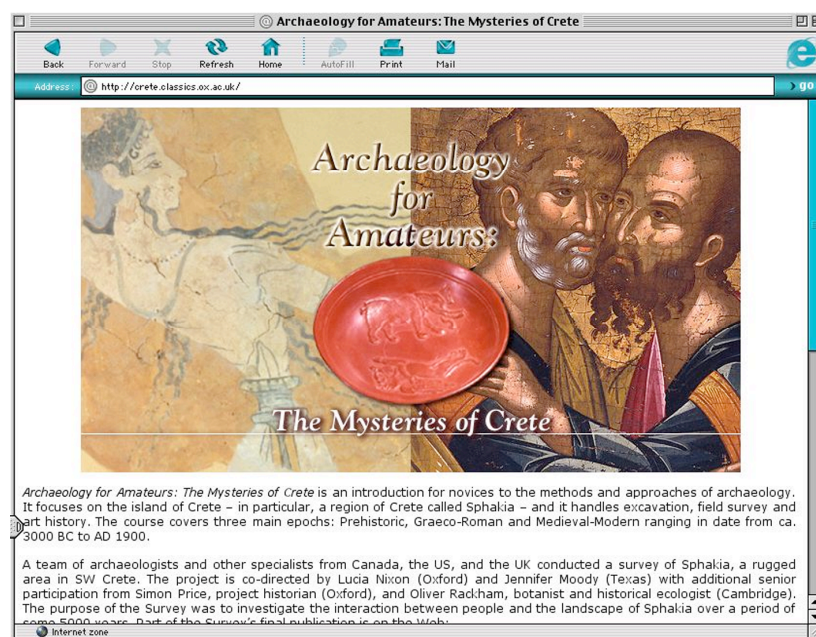
Figure 5. Crete Course Home Page

Tristram Wyatt (Director of Distance and Online Learning at Oxford) saw a demonstration of the Sphakia Survey website at an Oxford conference, and suggested that we develop a course based on it for the Alliance for Lifelong Learning. The Alliance is a venture between Oxford, Stanford and Yale universities offering online courses to their alumni, family and friends[13]. The online course, Archaeology for Amateurs: The Mysteries of Crete was developed with Oxford's Technology-Assisted Lifelong Learning unit (TALL), and makes use of the Survey website. It introduces students to archaeology in general and to the archaeology of Crete in particular; it can be accessed by anyone with an Oxford e-mail address[2].

One important element of our research and teaching in archaeology is making robust comparisons across time. In our own tutorials, we had tried previously in tutorials to get students to think and write about diachronic comparisons. Developing the course gave us the opportunity to think through and write down a possible method, combining text and illustrations, so that the students could learn to make their own comparisons. We will discuss the difference that this online material has made to students in tutorials.

The course introduces students to archaeology in general and to the archaeology of Crete in particular, with information on three main epochs: Prehistoric, Graeco-Roman, and Mediaeval-Modern, which are represented here by three images from the Ashmolean Museum's collections: a Minoan fresco fragment from Knossos, a Late Roman glazed bowl made in North Africa, and an icon from Crete.

The Sphakia Survey website in the end formed only a quarter of this Crete course, but our experience in making it was crucial, because we had already had to learn how to present information for the web. But we had enjoyed the process of learning how to present information and ideas electronically, which made us enthusiastic about devising this course.

The chief difficulty was not so much in learning the how to devise and meet the very precise learning objectives for each small piece of the course, but in adjusting ourselves to the reality that the contents of the website were fixed, but had to be suitable for a variety of potential takers. We developed the course with the aid of TALL[14]; the seven members of the TALL team are all listed at the end of this article. It was wonderful to be able to call on their very varied expertises. The resulting website is very much a collaborative achievement, not merely an academic project

[13] *Alliance for Lifelong Learning: http://www.alllearn.org/*

[14] *Technology-Assisted Lifelong Learning, Oxford University:*
http://www.tall.ox.ac.uk/tallinternet/

with an IT input. However, we should record here that the program devised to facilitate the production of the web pages proved a major impediment to creative thought and writing. We found that in order to write prose that flowed, we had to operate in Word, and have TALL import the files into their program.

Getting permissions for the pictures was a major issue. We provided many of them ourselves (some taken specially for the website on a trip to Crete in August 2002). And many objects in the Ashmolean were photographed specially for us, and copyright fees waived. But the rest all needed copyright clearance and payment. We provided the details of copyright holders, so far as we knew them (which was a lot of work), and TALL then did all the rest of the work of writing to copyright holders, and paying reproduction fees (which was not a negligible expense). As museums can charge up to £200 per image, reproduction fees are indeed becoming a serious impediment to the publication of scholarly works, and could also impede the creation of image-rich teaching resources.
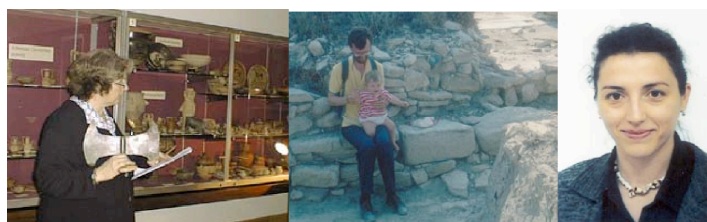
Figure 6. Lucia Nixon, Simon Price, and Eva Baboula

One of the exciting things for us was actually handling objects in the Ashmolean, particularly Prehistoric objects like the double axe in the left hand image (held by Lucia Nixon). The Ashmolean has the largest collection of Prehistoric antiquities from Crete outside Crete itself, as well as splendid examples of Graeco-Roman and Medieval-Modern material. Michael Vickers (Curator of Greek and Roman Antiquities) was at least as enthusiastic as we were at making the collections known to students on the course, and we could not have created the course without the support of the Ashmolean.

We drew heavily on our experience of field work and site-visiting on Crete. In the centre of the three images is Simon Price at the major site of Kommos in 1990. We revisited Kommos and other sites this past summer, with the baby now aged 14 and her younger sister, in order to take pictures for the course.

On the right is Eva Baboula, then an Oxford D.Phil. student, who was the course tutor. It was she who made the course come alive for the students through the ten weeks it ran, and who transformed a disparate group of people into an online course community. As is common to all learners of new material, the online takers of the Crete course felt a great need for the personal element which she provided. The weekly real time discussion sessions with her were popular; the takers much valued the fact that in the penultimate sessions one of us (Nixon) participated in the discussion. What is more, several of the takers made great efforts to visit Oxford (even from the States!) in order to meet her socially. Online courses are good, but they absolutely have to be animated by people.

The issue of online resources needing to be animated by people is really important. In Classics generally and in Classical Archaeology as well as other kinds of Archaeology, there has been a very quick take-up of IT and online resources for research. The reasons are obvious: databases and large image collections are useful for analysing texts and objects, buildings and indeed whole landscapes. So classicists and archaeologists were immediately excited by the research possibilities that online resources can offer, and indeed the publication possibilities that these new technologies can offer. But the take-up of online resources for university teaching has not been as quick, either for the academic or for the students. Academics in Oxford and in other universities know about the Sphakia Survey website as a research tool. Academics in Oxford have access to the online Crete course, as does anyone working from an ox.ac.uk domain. But while the Sphakia website is cited in publications, it is seldom, as far as we know, used in teaching. Similarly with the Crete course, we emailed the URL to all classicists and archaeologists in Oxford, and have as yet had very little teaching response to it.

This silence is very peculiar. Here is a custom-designed online resource with text and pictures which would fit into any number of tutorials or classes. So what is the problem? The course title is unlucky. 'Introduction to Archaeology: the Mysteries of Crete' was imposed on us from the American end of the Alliance, and is not academic enough as a title, nor does it make clear enough what is actually in the course. But the other reason for poor take-up for teaching both of the Sphakia Survey website and of the Crete course is, we think, devastatingly simple. We didn't tell people exactly how its resources would enhance teaching for particular papers in existing degree courses, whether in Classics, Classical Archaeology and Ancient History, Archaeology and Anthropology or Modern History.

One of the difficulties in conveying this information in a simple fashion relates to

the current state of the technology. With a book, you can tell people that chapter 3 of a new book is particularly relevant to their interests, or you can tell them to look at the table of contents. With websites, things are not so easy. Too many websites do not have tables of contents that are as informative as those in books, and referring to a particular section of a website in print is a nightmare because URLs can go on for a line or more of print. This problem with URLs is the internet equivalent of the problem of having rooms set up for showing videos. Both are examples of obstacles that have little to do with new technologies - AV technicians could be more helpful, and URLs need not be so long. Anyway, that is the bad news.

The good news is that when we have used the Crete course for specific teaching aims, it has been extremely helpful for students, because the two of us know exactly which bits of the course to use when. However, we would emphasise that the students, despite their exposure to IT throughout their schooling, need to be trained in the use and assessment of online resources. It rather surprised us to find that it was not us but the students who were the dinosaurs in using IT. The example we want to focus on now is an important element of our research and teaching.

Devising the online course gave us the opportunity to think through and write down something which has been an important element of our research, and also our teaching, for some time: making robust comparisons across time. We will look at two ways of making diachronic comparisons.

http://crete.classics.ox.ac.uk/U3S4/U3S4L1.html

First of all, this map of Crete made by John Pilbeam (formerly of the TALL team, now at Queen Elizabeth House in the Forced Migration Online unit) makes it possible to look at major sites of three time periods: Prehistoric, Graeco-Roman and Mediaeval-Modern, either separately or together. The odd gaps on the map are less surprising when you also see the contours, with mountains rising to almost 2500m.

http://crete.classics.ox.ac.uk/U3S4/U3S4L1.html

Secondly, this chart makes it possible to compare three different sites, one from each of the three major time periods, using a single set of variables such as size, government buildings, religions, etc. On the website, this chart follows an illustrated introduction to each of these three sites, and it makes it easy for students to see why variables consistently applied to all three sites and all three time periods make for robust comparisons.

The sign that the students have understood how to make comparisons over time and why they are important is when they start asking their own comparative questions? for example, does this type of script always correlate with site size and religious system? onto the network, opening a browser running and accessing the site and could only access the site with assistance. (Holley & Haynes 2003).

6.   Conclusions

In conclusion, we want to make three points:

1. New technologies, like the Internet, add new opportunities to our work in archaeology (as this paper has shown); they certainly do not remove past options. What is less obvious is that the technologies are not in themselves solutions to problems: they just give us other options for resolving them.

    In the case of the Sphakia Survey, we didn't give up our paper publications; we added other kinds of publication, using new technologies, because they could do things that paper could not. The same applies to teaching.

2. The opportunities that new technologies give us are not always the opportunities that we might expect. We made a video intended for teaching, which turned out also to be a good way of reporting to different audiences in the Canada, the U.S., the U.K., and Greece. In Canada, as we saw above, there is widespread suspicion of academic research using public funds, especially if it is work done outside Canada -- it is often seen as an elitist frill. But both video/television and the Internet are seen as popular media, accessible to all.   Archaeologists can make good use of this perception, wherever they work, in order to report accessibly to people in their country of research as well as to people at home.

3. New technologies -- in this case, video and the world wide web -- have given us opportunities to do several things differently, and we hope better: academic publication; teaching; and reporting to general audiences in Greece, in Canada, the U.K. and elsewhere.

As with all teaching and learning, context is everything. The best online resources in the world are useless if no one is using them. In this case, we did not specify the precise sections of the course which would fit into specific tutorial areas of specific papers or modules. So perhaps not surprisingly, our colleagues have not much used

the Crete course. By the same token, when we plugged the relevant bits of the online course into the relevant bits of a degree course, students not only used the course, but learnt a great deal from and with it.

Perhaps the most important opportunity that new technologies give us is the chance to reflect, seriously, on the nature of archaeological publishing and teaching. Who are our audiences? How best can we reach them? And how can we assess how well we are doing? Once we can answer these and other questions, we will know even better how to deploy new technologies in archaeology.

Acknowledgements

[15] *Sphakia project team: http://sphakia.classics.ox.ac.uk/projteam.html*

References

Bennet, J. 1996.   Review of *The Sphakia Survey (Greece): Methods and Results*, by L. Nixon and S. Price, *Bryn Mawr Classical Review*, 7, 327-33.

Cherry, J, J. Davis, and E. Mantzourani (1991) (eds). *Landscape Archaeology as Long-term History : Northern Keos in the Cycladic Islands from Earliest Settlement until Modern Times.* Monumenta Archaeologica (University of California, Los Angeles. Institute of Archaeology), 16. Los Angeles : UCLA Institute of Archaeology.

Cowan, J. 1990.   *Dance and the Body Politic in Northern Greece.* Princeton: Princeton University Press.

Davis, J., Alcock, S., Bennet, J., Lolos, Y., and Shelmerdine, C. 1997. The Pylos Regional Archaeology Project, Part I: Introduction and Archaeological Survey. *Hesperia*, 66, 391-494.

Davis, J., Alcock, S., Bennet, J., Lolos, Y., Shelmerdine, C., and Zangger, E. 1997. *The Pylos Regional Archaeological Project: Internet Edition*, http://classics.uc.edu/prap/.

Davis, J. ed. 1998.   *Sandy Pylos: An Archaeological History from Nestor to Navarino.* Austin: University of Texas Press.

Francis, J., Price, S., Nixon, L., and Moody, J. 2000. "Agiasmatsi: a Greek Cave Sanctuary in Sphakia, SW Crete." BSA, 95, 427-469.

Francis, J. 2000. Finds of Graeco-Roman Beehives from Sphakia, SW Crete, abstract of paper at conference on Bee-keeping in the Graeco-Roman World, held at Lady Margaret Hall, Oxford University, 7 November 2000, http://sphakia.classics.ox.ac.uk/beeconf/francis.html.

Hamilakis, Y. 1997. review of *The Sphakia Survey (Greece): Methods and Results*, by L. Nixon and S. Price. Visual Anthropology, 9, 193-194 .

Keller. D. and D. Rupp (eds). 1983. *Archaeological Survey in the Mediterranean*, 375-416. Oxford: British Archaeological Reports , International Series 155.

Mee, C. 1999. review of *The Sphakia Survey (Greece): Methods and Results*, by L. Nixon and S. Price. Antiquity, 73, 725.

Moody, J., Nixon, L., Price, S., and Rackham, O. 1998. "Surveying Poleis and Larger Sites in Sphakia." In *Post-Minoan Crete* (*BSA* Studies 2), 87-95. London: British School at Athens.

Moody, J. and Lewis Robinson, H. 2000. "The Fabrics of Life in Sphakia." In Pepragmena tou H' Diethnous Kretologikou Sunedriou, A2, 349-357.

Moody, J., Robinson, H., Francis, J., and Nixon, L. 2003. "Ceramic Fabric Analysis and Survey Archaeology: the Sphakia Survey." *BSA*, 98.

Nixon, L. 1988. "The Sphakia Survey. " *Bulletin of the Canadian Mediterranean Institute* , VIII, 2: 12; other short reports published in the CMI Bulletin   in 1989, 1990.

Nixon, L. 1993.   review of *Landscape Archaeology as Long-Term History. Northern Keos in the Cycladic Islands from Earliest Settlements until Modern Times*, edited by J. Cherry, J. Davis and E. Mantzourani. EchCl,   37, n.s. 12:385-9.

Nixon, L. 2000.   Traditional Bee-keeping in Sphakia, SW Crete, abstract of paper at conference on Bee-keeping in the Graeco-Roman World, held at Lady Margaret Hall, Oxford University, 7 November 2000, http://sphakia.classics.ox.ac.uk/beeconf/nixon.html.

Nixon, L. 2001a. "Seeing Voices and Changing Relationships: Film, Archaeological Reporting, and the Landscape of People in Sphakia", *American Journal of Archaeology* 105.1: 77-97; the article can be downloaded from: http://www.ajaonline.org/archive/105.1/i_toc.html

Nixon, Lucia 2001b. "Introducing Undergraduates to Archaeological Research Data". Unpublished conference paper given at the ASTER/ OxTALENT Conference on Educational Technology, Oxford 26-27 March 2001.

Nixon, L. 2002. Melian Obsidian and Glassy Quartz in Sphakia, abstract of paper given at the 103rd Annual Meeting of the American Institute of Archaeology, Philadelphia, 3-6 January, *AJA* 106.2: 246-247.

Nixon, L. in press. *Making a Sacred Landscape: Outlying Churches and Icon Stands in Sphakia, Crete, A.D. 1000-2000* , accepted for publication as a monograph by Oxbow Press, Oxford.

Nixon, L. and J. Moody 1988. "Epiphaneiaki Erevna sta Sphakia."   *Khaniotika Nea* 26 January 1988: 3.

Nixon, L., Moody, J., and Rackham, O. 1988.   "Archaeological survey in Sphakia, Crete." *EchCl* 32, n.s.7: 159-73, republished with illustrations as http://sphakia.classics.ox.ac.uk/emccv1988.html

Nixon, L., Moody, J., Price, S., and Rackham, O. 1989.   "Archaeological Survey in Sphakia, Crete."   *EchCl* 33, n.s.8: 201-15, republished with illustrations as http://sphakia.classics.ox.ac.uk/emccv1989.html

Nixon, L., Moody, J., Price, S., Rackham, O., and Niniou-Kindeli, V. 1990. "Archaeological Survey in Sphakia, Crete." *EchCl* n.s.9: 213-20, republished with illustrations as http://sphakia.classics.ox.ac.uk/emccv1990.html

Nixon, L., Moody, J., Price, S., and Rackham, O. 1994. "Rural Settlement in Sphakia, Crete."   In   *Structures Rurales et Sociétés Antiques.Actes du colloque de Corfou 14-16 mai 1992*, edited by P. Doukellis and L. Mendoni, 255-64.   Annales littéraires de l'Université de Besançon. Paris: Les Belles Lettres.

Nixon, L., Moody, J., and Price, S. 1998. "Settlement Patterns in Mediaeval and Post-Mediaeval Sphakia: Issues from the Environmental, Archaeological and Historical Evidence." Paper presented at the Mediaeval and Post-Mediaeval Greece Conference, 1-3 May, Corfu, published as http://sphakia.classics.ox.ac.uk/bvtpaper.html

Nixon, L., Price, S., Moody, J., Rackham, O. 2000. *The Sphakia Survey: Internet Edition*. http://sphakia.classics.ox.ac.uk

Nixon, L., and Price, S. 1995. *The Sphakia Survey (Greece): Methods and Results* (50 minute videotape). Oxford: Media Production Unit, 37 Wellington Square, OX1 2JF.

Nixon, L., and Price, S. 2001. "The Diachronic Analysis of Pastoralism through Comparative Variables", *BSA* 96: 395-424.

Price, S., Higham, T., Nixon, L., and Moody, J. 2002. "Relative Sea-level Changes in Crete: Reassessment of Radiocarbon Dates from Sphakia and West Crete." *BSA* 97: 171-200.

Renfrew, C. and Wagstaff, M. 1982. (eds) *An Island Polity: the Archaeology of Exploitation in Melos*. Cambridge: Cambridge University Press.

Tzirtzilakis, E. 1996. "Mithoi kai Istoria."   *Ta Sphakia* 83: 8-9, in Greek, republished at http://sphakia.classics.ox.ac.uk/greek.html