

35

New technology in archaeological education and training

Roger Martlew*

35.1 Introduction

Computing can now be regarded as an established part of archaeological work, both in academic research and in fieldwork. However, little attention has so far been paid to the training which archaeologists receive in computing, or to the opportunities which it offers in the teaching of archaeology and related subjects in general. Most of those who are active in the field belong to the first generation of computing archaeologists, and owe their current positions to experience gained at first hand in an emerging discipline.

From its early image as the esoteric province of the specialist, there is now an awareness that at least some aspects of computing and information technology are important to everyone involved in archaeology. This feeling is shared by other subjects, but influences other than the purely educational may also be felt. Teachers of Humanities subjects, in particular, may feel threatened by the recent concentration of interest and funding in more strongly technological areas. The adoption of computing may be seen, somewhat cynically, as a way of demonstrating a subject's relevance in a modern technological society.

External pressure is increasing on archaeology, with rationalisation in the universities and a greater emphasis on training in government-supported projects for the unemployed. It is appropriate at this stage to consider whether the next generation of archaeologists is receiving adequate training in computing techniques. It is also worth considering whether the type of training which can be offered by archaeologists may be of value in careers outside the discipline. Moreover, the two archaeology projects funded by the *Computers in Teaching Initiative* (Martlew 1988 and O'Flaherty, this volume) provide a timely focus for discussion of the role of computing in the wider education of archaeologists.

Archaeological computing is being taught in a changing educational climate. The dichotomy between research and teaching is being accentuated by pressures on funding, and by re-structuring within Higher Education. The rewards of research—conferences, publications and promotion—do not extend to teaching. Consequently, there is little incentive for lecturers to spend time developing innovative courses in archaeological

* Department of Archaeology,
University of Leicester
LE1 7RH

computing, to the detriment of their research and ultimately their promotion prospects. This has a direct effect on the quality of teaching, not only in this subject but across the whole range of subjects taught in universities and colleges.

Courses can be taught *about* computers, and they can also be taught *with* computers (Richards 1987, p. 159): there is tremendous potential for development in the latter, as the two *Computers in Teaching Initiative* projects are demonstrating. It is significant that few papers presented at CAA conferences deal with this topic (see Richards 1986a and Avery 1988 for recent examples), and yet progress can only be made on a sound basis of research and experience.

35.2 Educational background

35.2.1 The primary and secondary sectors—the starting point for future generations of computing archaeologists

It would be short-sighted of professional archaeologists to ignore the potential of archaeology in schools. Future professional and amateur archaeologists, and future rate-payers (Community Charge payers?) can all have their attitudes to the past shaped in a positive way at an early age. Archaeology as a subject in its own right does not figure largely in primary or secondary syllabuses, and yet interest is probably at its highest among pupils in this age range. The low profile of the subject is due in part to a lack of archaeological training for teachers. A vicious circle now exists, with lack of demand leading to depleted resources, and the shortage of resources discouraging teachers from taking on the subject. As a fringe subject, any archaeology teaching which exists is also under serious threat from plans for a National Curriculum. The pressure to devote timetable time to "core" subjects will only confirm the position of archaeology as, if anything, no more than a minor subset of History teaching. However, the emphasis on practical project work in GCSE syllabuses may improve the chances of some archaeology being taught. Work with primary evidence is encouraged, and information about local areas is seen as an important resource to be used by pupils at first hand.

What is the significance of this for an audience concerned with pushing back the frontiers of research in archaeological computing? Archaeology is one of a few subjects which are taught in Higher Education with little or no groundwork having been laid in schools. Courses in archaeology therefore have to start at a basic level, whereas history or geography courses, for example, can assume a certain amount of basic knowledge and skill. Moreover, the absence of archaeology in schools means that a certain amount of misinformation may have to be overcome when students are introduced to the subject at university. The quality of future research depends on attracting students of ability, who have at least a realistic view of the subject. The encouragement of archaeology in schools can only improve the security and standard of archaeology, and archaeological computing, at higher levels.

The means to rectify this situation lie in our own hands. The teaching profession can be encouraged to pay greater attention to archaeology by the provision of new materials, which will have appeal on two fronts. There is a need for support for project-based work with evidence from the past. There is also a need for materials which support the use of computers in the classroom. In this context the broad range of applications relevant to archaeology is particularly attractive (Martlew 1987).

Archaeological computing offers interesting opportunities for teaching *about* computers, and also for teaching *with* computers. The subject can be "sold" in this context not only to history and archaeology teachers, but also to others who may be looking for different ways of approaching the subject of new technology. It is important that we recognise and take up this challenge, because the process of misinformation has already begun. Computer programs which over-simplify archaeological research, reducing it to the level of treasure-hunting, have for some time been on sale to schools. In the hands of a good teacher, with a good knowledge of archaeology, these programs can be useful. If the teacher has little familiarity with modern archaeology, though, they can seriously misrepresent the subject, and waste valuable educational opportunities.

35.2.2 Further and Higher Education sectors

Formal education in archaeology, which might involve an element of computing, is largely restricted to university courses, and a few institutions outside the university sector such as the Dorset Institute of Higher Education. Because of the lack of archaeology teaching in schools, undergraduate courses inevitably start at a very basic level. The few of us who have managed to do A Level archaeology at school are only too well aware of this. Although secondary school pupils increasingly have access to microcomputers, they will not usually have come across the mainframe facilities which polytechnics and universities possess. This is only a matter of scale: the basic computing skills to which undergraduates are being introduced *should* have been covered at school. While this may be true for science students, it is still not the case for the majority of pupils from an Arts or Humanities background.

Few attempts have been made to establish what archaeology undergraduates are actually taught, although attention has recently been focussed on this topic. The traditional autonomy of the universities has led to considerable diversity (Austin 1987). The major factor which most courses hold in common is that they are non-vocational. There would appear to be little pressure from the market to change this: most of the students who study archaeology have little intention of pursuing it as a career—if such a thing exists. The main effect on the teaching of archaeological computing seems to be to produce courses influenced by academic research computing, rather than overtly considering the practical needs of archaeological Units.

Most university lecturers would not see anything wrong with this situation, and would not recognise 'an obligation to turn out competent excavators' (Richards 1987)—or competent computer archaeologists—at anything more than the lowest levels of expertise. Although usually required as a measure of general ability, a degree in archaeology is not a professional qualification for Unit staff or managers, or for employees of English Heritage or the Royal Commissions on Historical Monuments. Without the equivalent of postgraduate qualifications validated by the profession, as in accountancy or architecture, there is little feedback from employers on the content, or quality, of archaeology courses. The one forum which exists in this area is the Institute of Field Archaeologists, which has recently reported on the subject of training in the profession as a whole (Carver 1987). Information on undergraduate courses was collected by the Training Working Party, which concluded that it '...does not feel itself in a position at present to comment on their content...' (ibid., p. 33). It will be interesting to see whether this body will be able to bring influence to bear on academic institutions in

the future.

Given the general lack of communication between archaeological employers and educational institutions, it is difficult to identify the best location for introducing new skills, such as computing, for those who wish to work in archaeology. Commercial and in-house training courses have proved inadequate (Grant 1986, p. 29), and universities are unwilling to be seen to be offering vocational training. New postgraduate courses at York and Southampton universities may, however, indicate a softening of these non-vocational principles.

35.3 The teaching of archaeological computing in British universities—a survey

The ad-hoc development of archaeological computing courses in universities has resulted in a wide variety of provision. In order to assess the current situation, a telephone survey of major university departments has been carried out. The focus of the survey differs from that of the IFA/RCHM(E) survey (Richards 1986b), in concentrating on details of undergraduate courses rather than the hardware and software in use for teaching and research. Information was obtained from 19 departments, but the variety of caveats which were added to the responses makes quantification difficult. Courses inevitably vary with the different overall structures of degree courses at different institutions. Several lecturers acknowledged that current provision is inadequate, and some were pessimistic about the potential for improvement. Only one of the departments approached offers no computing at all.

35.3.1 Introductions to computing

Introductions to archaeological computing—which can be very basic indeed—inevitably appear most frequently in the first or second year of a degree course. The time spent on them can vary from as little as a mention in an archaeological techniques course, to a one-year course occupying several hours per week. 13 out of the 18 introductory courses are compulsory, and at least one university has a stated policy that within the next few years *everyone* graduating will be ‘computer-literate’. Introductory courses are generally taught within archaeology departments, by archaeologists.

35.3.2 Advanced computing

Advanced courses are mostly optional, and usually appear in the final year of the degree. In practice, much of the ‘advanced’ computing takes the form of dissertation work, rather than a taught course. Such work is discouraged in at least two universities due to a shortage of hardware. At this level the emphasis is not on developing computing skills *per se*, but on more detailed use of the computer for a specific archaeological project. Where formal courses are offered, there is more collaboration with external departments such as Computer Science or Maths, and the emphasis can shift away from archaeology. This is a reflection of the fact that, inevitably, many of the people teaching archaeological computing do not have a background in computing, but are themselves still learning by first-hand experience (see Greene 1988 for example). It is interesting to record a fairly general lack of satisfaction with externally taught courses, which often seem to be avoided by archaeology students.

35.3.3 Assessment

A range of assessment methods is associated with these courses, from none at all to essay questions in examination papers on archaeological techniques. The practical nature of the subject is acknowledged by the amount of continuous assessment and project work, including dissertations, which is used instead of or in addition to written papers. In many cases computing is seen as a means to an end, and it is the results which are assessed rather than competence in the skills which helped to produce them.

35.4 Conclusions

The survey confirms the intuitive view that archaeology undergraduates receive a very patchy education in the use of computers. There is an obvious distinction between teaching *about* computers and teaching *with* computers, and both approaches are largely confined to archaeological techniques courses. There are very few applications in the teaching of other areas of archaeology, where computer-assisted learning (CAL) can add another dimension to lectures and tutorials. Something approaching this is achieved in individual dissertations which use the computer for solving archaeological problems, and this technique could usefully be extended for group teaching. That developments are unlikely to take place in the area of CAL was clearly expressed in one response to the survey: the extra work involved, and the lack of credit which would be received for it, meant that interesting ideas were not being turned into materials for students to use. Educational applications of archaeological computing remain underdeveloped, partly due to a lack of expertise, but mainly due to a lack of time.

It is in this area that the UGC's *Computers in Teaching Initiative* is trying to promote the use of computers. However, apart from special one-off initiatives such as this, it is unlikely that there will be support for further work in this field. It is not regarded as relevant by the bodies which normally fund research in archaeology, and there generally seems to be little institutional support for development work in undergraduate teaching.

It is the hope of those behind the *Computers in Teaching Initiative* that individual subject associations will carry on the good work of encouraging the development of CAL in Higher Education (Nigel Gardner, Director of CTI Support Service, *pers. comm.*). However, it is doubtful whether these associations have either the breadth of vision or sufficient funds to support such work. Since there is no subject association for archaeology, and the bodies which normally fund archaeological research exclude educational development, it is unlikely that the potential of this area of computing will be realised.

The archaeological computing which is taught at undergraduate level is influenced primarily by academic research computing. The use of computers in Units may be described, but there is little attempt to provide vocational training for 'Information Management' in a professional context (Grant 1986, p. 29). University departments would seem to be an obvious place for this sort of training within archaeology, in the absence of anywhere else, and their interest could perhaps be aroused by the revenue earning potential of running such courses. The traditional form of one-year postgraduate course, though, is not sufficiently flexible to meet the needs of in-service training for the profession. Unit staff would find it easier to obtain release for shorter courses, which might use a credit system to build up to a qualification. Universities may

well find themselves forced by economic necessity into the change of role demanded by such courses.

Unfortunately, though, current external pressures on universities are only likely to reduce institutional support for innovation (Elton 1987, p. 171). In this climate, archaeological computing for both internal and external courses will develop in a piecemeal way, relying on the enthusiasm of individuals who choose to work in their own time, or who are prepared to allow their recognised research interests to suffer. This will inevitably have an effect on the quality of graduates, and on the standard of research in archaeological computing which is carried out in the future. When the potential is so great, this must be a matter for grave concern in a subject which, in many institutions, is still trying to establish itself.

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