

« ARCHEOLOGIA E CALCOLATORI »
 A NEW ITALIAN JOURNAL IN THE FIELD OF ARCHAEOLOGY
 AND COMPUTER SCIENCE

The first issue of the journal « Archeologia e Calcolatori » appeared in 1989 upon initiative of the Institute of Etruscan-Italic Archaeology of the C.N.R. (National Research Council), together with the Department of Archaeology and History of Art of the University of Siena. The « Edizioni all'Insegna del Giglio » in Florence were chosen as publishers because of their long-standing experience in the publication of journals and books dealing with archaeology.

The reasons which prompted these two institutes to set up the new journal can be traced primarily to their activity in this field of studies. For example, the Institute of Etruscan-Italic Archaeology, where I carry on my research, established ten years ago a laboratory dedicated to the applications of computer science instruments and quantitative techniques for the analysis of archaeological data. This has led to diverse areas of research. Among the projects carried out and those still in course, some of the more important are: the mathematical and statistical analysis of Etruscan artifacts *corpora*, such as the mirrors and urns (MOSCATI 1984, 1986, 1990); the computerization of the *Thesaurus Linguae Etruscae* (PANDOLFINI, MOSCATI 1992); the database of archaeological objects from the Cerveteri excavations (MOSCATI 1991); the automatic processing of the photographic and graphic archives of the Institute.

As well as this specific research activity, the stimulus to setting up a new journal came from the analysis of the situation which characterized this sector of studies in Italy. In fact, while the growing interest and the multiple experiments carried out allows recognition, with particular emphasis on the historical period, of the positive affirmation of computers in archaeological research, the obvious need emerges to create a point of stable editorial reference, in order to collect experiences and to diffuse Italian activity in an international context. Such an editorial pole has been lacking up till now; in Italy there are in fact few archaeological journals presenting brief technical sections. Among these are the « Rivista di Archeologia » and « Archeologia Medievale ». In the more general field of cultural heritage, may I quote the « Bollettino d'Informazioni della Scuola Normale di Pisa », recently renewed.

So our journal was set up with the idea of presenting in an organic and systematic manner the results of research carried out in the field of historical archaeology with the help of computers; to offer an up-to-date edition of projects in course both in Italy and abroad; to pave the way for new developments in

the application of computer instruments. The limits of the chronological period under examination do not exclude, but rather subordinate, the larger and more specialized sector of prehistoric archaeology, to the advantage of demands and applications relative to the classical and post-classical period. It is evident that, especially from a methodological point of view, the contribution of prehistorical studies remains irreplaceable; this sector, in fact, carries on an innovative function and, within certain limits, acts as a model oriented, as it has been for so many years, towards similar analytical methodologies.

However, the pre-eminent attention focused on historical archaeology constitutes an element of originality for the journal and allows it to act as an assembling point for the now numerous and significant initiatives which are currently being carried on in this field. The particular chronological perspective also offers a special characteristic in the international context. In fact, the diffusion of information in this sector of studies in Europe, apart from a few brief "information letters" like « Archaeological Computing Newsletter » and « Archéologues et Ordinateurs », is restricted to the journal « Science and Archaeology » and, for the regularity and extent of its contents, to the Proceedings of the Meetings *Computer Applications in Archaeology*, which, since 1987, are published in the international series of the British Archaeological Reports. They still represent, however, generalized initiatives, not specifically aimed at the historical period.

During the organizational phase of our journal, the desire to create an opening and a continuous exchange of information with foreign countries prompted the constitution of an international Scientific Committee. Representatives of the major Italian and foreign institutes interested in the application of computers to the humanistic field accepted our invitation to become members. A competent editorial board also assures a continuous flow of information and permits a profitable exchange of opinions.

The formal establishment of our journal was articulated in three parts. The first is of a methodological character: it collects the articles concerning the application of computers in archaeology and the reports on research activity and programmes carried out by specific institutes. The central part contains articles on experiments and projects realized in the different fields of investigation in which computer applications are used: quantitative analysis, automatic processing of archaeological data, computer graphic techniques and image enhancement; a section is also reserved for the management of documentary sources. The last part of the journal presents three sections dedicated respectively to book reviews, the bibliographical review and the news letter. These sections strive to assure readers an up-to-date source of documentation, and constitute for foreign readers, an instrument of information on research projects carried

out in our country.

Examination of the articles which appear in the first three volumes permits several considerations and reflections. As to the methodologies of investigation, it is now generally recognized that archaeology, always more present in the historic-economic reality of single countries and characterized by an interdisciplinary cooperation, finds in the new methodological approach and in the procedures made available through computers a point of reference and, at the same time, a source of renewal (DJINDJIAN 1990; FRANCOVICH 1990). It also appears evident that computer science, and in particular some of its newer investigative trends, offered for example by the expert and multi-hypermedial systems, can open up new horizons of methodological reflection in archaeology (DE GUIO 1991).

With regard to the different sectors of investigation, of particular interest is the situation relative to the quantitative analysis of historical archaeological artifacts, a field up till now much less developed (MOSCATI 1990a, 1990b). The presence in our journal of a conspicuous number of articles devoted to these themes already constitutes a positive result, offering the basis for the future development of the quantitative approach. From the analysis of these articles a change of tendency regarding archaeological problems under investigation clearly emerges: from the phase in which the quantitative approach was used almost exclusively for the morphometric and typometric analysis of archaeological artifacts, we see today a deeper analysis of the consistency and the distribution of homogeneous complexes of objects, with particular emphasis on ceramics (ORTON, TYERS 1990; SEMERARO 1990; PICAZO MILLÁN 1991; FONTANA 1991; GUERMANDI *et al.* 1992).

The sector dedicated to the automatic processing of archaeological data with the use of computer science techniques now constitutes the most developed field of investigation in the historical archaeological ambit (GINOUVÈS, GUIMIER-SORBETS 1991; FERRARI 1991). This sector appears characterized by the flourishing of databases, for the recording of the national historic-artistic patrimony (BIANCHI 1991; SANI, LAVECCHIA, LOSI 1992) and, above all, for the management and classification of the numerous and diverse information, which contributes to the analysis and interpretation of data coming from archaeological excavations (GUERMANDI 1990; BIANCHIMANI, PARRA 1991; BENELLI 1992).

The projects presented show a tendency to exceed the criteria of unification of methods and procedures at the national level; at the same time they create personalized programmes finalized to single operational necessities. From the analysis of the projects in course it is possible to list some particular innovative aspects. Firstly, the necessity, always present in archaeological studies, to possess an association between data and images has paved the way towards experi-

mentation in a sector of computer science connected to the use of video discs and of software systems finalized to the automatic management and processing of graphic and photographic data. Secondly, the complex nature of archaeological information, its consistency and the diverse historic and artistic implications deriving from its analysis have offered the cue to a widespread use of hyper-medial and hyper-textual systems, which are particularly flexible in the management of heterogeneous data and in the examination of their reciprocal connections (BIANCHIMANI, PARRA 1991; BOAST, CHAPMAN 1991; CONFORTI, ESPOSITO 1991; LIMIDO, RICOTTI 1991).

Even the sector devoted to computer graphics is now notably widespread, and this appears to be strictly related to the recent tendency to institute cooperation between private enterprises and public bodies devoted to the safeguarding of the national historic-artistic patrimony. The development of this sector has led to the broadening and to the perfection of specific differentiated research areas. These regard, in particular, archaeological mapping and the processing of satellite and aerial photographs, especially useful in topographical and urban studies (SOMMELLA, AZZENA, TASCIO 1990; GUIDAZZOLI, FORTE 1992; PICCARRETA 1992). They also regard the acquisition and the representation of images relative to objects or mural structures (KRINZINGER, SCHICK, TEEGEN 1990; GOTTARELLI 1992), as well as the simulation of the original aspect of antique monuments, necessary for architectural reconstruction and any eventual restoration.

This brief panorama of the contents and investigative methodologies which characterize the articles published so far lays the base for new ideas of research. Above all, it paves the way for a new series of working hypotheses and prospects to enlarge our journal. From a point of view of contents, it seems convenient to offer a specific space to research projects which concern sectors lesser known in Italy. I refer in particular to the field of artificial intelligence, with its expert systems, and to the sector dealing with modelling and simulation. I should add that projects devoted to these problems, which abroad constitute normal arguments for discussion during meetings dedicated to computer application in archaeology, are inadequate in Italy.

A particular space should be reserved for the utilization of computer instruments as an aid to archaeological education (ZACCARIA RUGGIU 1991; PAGLIANI 1992); this, too, is a sector which shows serious shortcomings and distinct delay in respect to the international scene, probably due to the slower entry of computers in the various departments of the universities and to the total absence, if we exclude a few specialized courses, of any didactic programmes dealing with computer techniques applied to archaeology.

From a technical point of view, the development of contributions devoted

to the description of hardware and software suitable for application in specific sectors of investigation seems useful. In fact, some articles (D'AGATA 1991; MEDRI, POLESE 1991) show that the indications offered, results of direct experiments in the archaeological field, can be of notable help to those who effect analogous choices and who often encounter difficulties when they come into direct contact with the world of computers.

As to the spread of information, the principal means seem to be the development of the sections dedicated to the bibliographical documentation and to the news letter. These sections, in fact, allow us to project our experience in an international panorama and to offer more immediate access, particularly through exchanges, to publications whose availability in Italian libraries (and in foreign libraries as well) is still not organized.

As to support initiatives for our journal, we would like to see the constitution of a database connected to the journal itself, in which the information contained in each volume would be made available. Lastly, in the future, we hope to constitute a series of monographs in which, for example, the proceedings of meetings or seminars and miscellaneous volumes dedicated to specific problems of investigation could be published. To this end, we hope that the publication in the fourth volume of « Archeologia e Calcolatori » of the papers presented during the course of this meeting will constitute the confirmation of the validity of our future intentions.

PAOLA MOSCATI

Istituto per l'archeologia etrusco-italica
C.N.R. - Roma

BIBLIOGRAFIA

- BENELLI M.V. 1992, *Le collezioni archeologiche dell'Opera della Primaziale Pisana. Un sistema ipertestuale per la catalogazione automatica di materiali antichi reimpiegati*, « Archeologia e Calcolatori », 3, 139-155.
- BIANCHI L. 1991, *Uno studio per la catalogazione territoriale ed architettonica del centro storico di Roma*, « Archeologia e Calcolatori », 2, 205-220.
- BIANCHIMANI A., PARRA M.C. 1991, *NIKE: progetto di una base di dati archeologica*, « Archeologia e Calcolatori », 2, 179-203.
- BIETTI A., BURANI A., ZAMPETTI D. 1992, *An example of supervised classification in paleolithic archaeology*, « Archeologia e Calcolatori », 3, 7-17.
- BOAST R., CHAPMAN D. 1991, *SQL and Hypertext generation of stratigraphic adjacency matrices*, « Archeologia e Calcolatori », 2, 221-239.
- CONFORTI P., ESPOSITO A. 1991, *Proposta di un sistema ipertestuale per il trattamento della documentazione in archeologia*, « Archeologia e Calcolatori », 2, 241-250.
- D'AGATA M.G. 1991, *Il CAD commerciale per l'archeologia*, « Archeologia e Calcolatori », 2, 123-127.

- DE GUIO A. 1991, *Calcolatori ed archeologia: un progetto per gli anni '90*, « Archeologia e Calcolatori », 2, 25-78.
- DJINDJIAN F. 1990, *Nouvelles tendances méthodologiques dans le traitement de l'information en archéologie*, « Archeologia e Calcolatori », 1, 9-13.
- FERRARI O. 1991, *La catalogazione dei beni archeologici e le tecnologie informatiche*, « Archeologia e Calcolatori », 2, 13-17.
- FONTANA S. 1991, *Analisi comparata delle attestazioni della ceramica africana nel V sec. d.C.: un'indagine preliminare*, « Archeologia e Calcolatori », 2, 109-121.
- FRANCOVICH R. 1990, *Dalla teoria alla ricerca sul campo: il contributo dell'informatica all'archeologia medievale*, « Archeologia e Calcolatori », 1, 15-26.
- GINOUVÈS R., GUIMIER-SORBETS A.-M. 1991, *Un centre de recherches sur les systèmes d'information en archéologie*, « Archeologia e Calcolatori », 2, 7-12.
- GOTTARELLI A. 1992, *La video-documentazione elettronica dello scavo archeologico (V.M.D.). Studi ed esperienze per il progetto di una periferica dedicata*, « Archeologia e Calcolatori », 3, 77-99.
- GUERMANDI M.P. 1990, *ALADINO: verso un sistema computerizzato per lo studio e l'analisi dei dati archeologici*, « Archeologia e Calcolatori », 1, 263-294.
- GUERMANDI M.P., QUARTILI L., SANTORO BIANCHI S., MINGUCCI R. 1992, *Le sperimentazioni sulla ceramica dell'Istituto di Archeologia dell'Università di Bologna*, « Archeologia e Calcolatori », 3, 157-198.
- GUIDAZZOLI A., FORTE M. 1992, *Archeologia e tecniche di eidologia informatica*, « Archeologia e Calcolatori », 3, 37-76.
- KRINZINGER F., SCHICK M., TEEGEN W.R. 1990, *Un calcolatore disegna e registra ceramica antica: il sistema ARCOS1 negli scavi di Velia, comune di Ascea (Salerno)*, « Archeologia e Calcolatori », 1, 179-209.
- LIMIDO L., RICOTTI M. 1991, *Le componenti paesistiche negli insediamenti coloniali di Sicilia e Magna Grecia: un ipertesto per la ricerca*, « Archeologia e Calcolatori », 2, 251-282.
- MEDRI M., POLESE W. 1991, *Una banca dati di immagini su videodisco*, « Archeologia e Calcolatori », 2, 129-172.
- P. MOSCATI 1984, *Ricerche matematico-statistiche sugli specchi etruschi*, Contributi del Centro Linceo Interdisciplinare di scienze matematiche e loro applicazioni, 66, Roma, Accademia Nazionale dei Lincei.
- MOSCATI P. 1986, *Analisi statistiche multivariate sugli specchi etruschi*, Contributi del Centro Linceo Interdisciplinare di scienze matematiche e loro applicazioni, 76, Roma, Accademia Nazionale dei Lincei.
- MOSCATI P. 1990a, *L'analisi quantitativa nell'archeologia di epoca storica*, « Archeologia e Calcolatori », 1, 39-80.
- MOSCATI P. 1990b, *Indirizzi e sviluppi dell'Archeologia Quantitativa*, in P. MOSCATI (ed.), *Trattamento di dati negli studi archeologici e storici*, Informatica e Discipline umanistiche, vol. III, 1-54.
- MOSCATI P. 1991, *Ricerche nell'area urbana di Caere: la gestione automatizzata dei dati di scavo*, in AA.VV., *Miscellanea etrusca e italica in onore di M. Pallottino*, « Archeologia Classica », 43, 303-316.
- ORTON C.R., TYERS P.A. 1990, *Statistical analysis of ceramic assemblages*, « Archeologia e Calcolatori », 1, 81-110.
- PAGLIANI M.L. 1992, *Beni culturali: didattica al computer*, « Archeologia e Calcolatori », 3, 199-206.
- PICAZO MILLAN J.V. 1991, *Contribución de análisis estadísticos para la diferenciación de grupos "culturales" durante la Edad del Bronce en el Sur del Sistema Ibérico (Teruel, España)*, « Archeologia e Calcolatori », 2, 79-108.

- PICCARRETA F. 1992, *Fotogrammetria finalizzata all'archeologia: il contributo del calcolatore*, « Archeologia e Calcolatori », 3, 101-120.
- SANI M., LAVECCHIA F., LOSI D. 1992, *SIRIS — Sistema informativo dei beni culturali e delle fonti documentarie*, « Archeologia e Calcolatori », 3, 121-138.
- SEMERARO G. 1990, *Note sulla distribuzione delle ceramiche di importazione greca nel Salento in età arcaica. Aspetti metodologici*, « Archeologia e Calcolatori », 1, 111-163.
- SOMMELLA P., AZZENA G., TASCIO M. 1990, *Informatica e topografia storica: cinque anni di esperienza su un secolo di tradizione*, « Archeologia e Calcolatori », 1, 211-236.
- ZACCARIA RUGGIU A. 1991, *Sperimentazione dell'informatica nella didattica dell'archeologia*, « Archeologia e Calcolatori », 2, 19-23.