

# 25 European archaeological databases: problems and prospects

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## 25.1 EUROPE ANNO DOMINI 1992

Written for the opening of the CAA 92 conference, and presented with a large number of colourful slides, the lecture *European Archaeological Databases — Problems and Prospects* could be likened to a gold-framed painting of a giant, bellowing stag against the background of a woodland lake, executed with broad brush, powerful strokes and strong colours from the palette — the latter being used above all in the representation of the flaming sunset behind the scene. It is difficult, and perhaps not very interesting, to reproduce such a picture in black and white, and so it is with the text of this lecture too. For this publication, it has been necessary to change the form, in part, and the contents, a little, but the theme is still the same.

For Europe 1992 is a magic number. This is the year of the internal market and for decisions on the union of the 12 EC countries. Along with the opening up of the internal market with its free movement of goods and labour, we who work on archaeology and cultural history day in day out have a duty to ensure that our data can move freely in future over what formerly had been such closed boundaries. Europe shall not only be an economic community but also a cultural one.

But Europe of course is more than the present group of 12. The fall of the Berlin Wall on the night of November 10th 1989 came to mark the end of the Cold War and the beginning of the New Europe, which alas is still suffering such terrible birth-pains.

It is important therefore to intensify international contacts at all levels and across what were previously such definite boundaries. We must fight against new and even stronger boundaries being established around Europe's rose-garden. Our common cultural history should be able to play a decisive role in this matter.

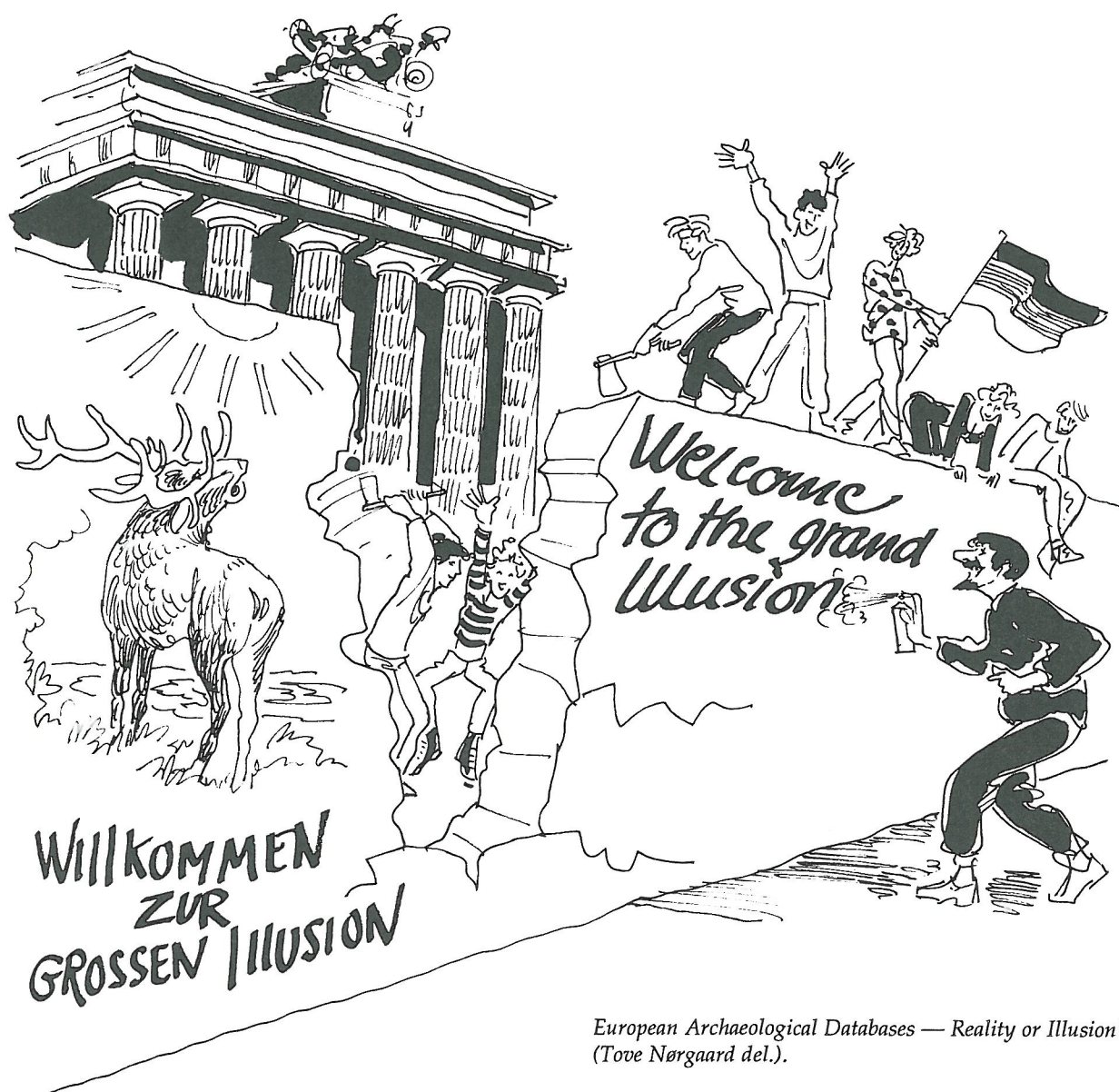
But successful and meaningful international co-operation needs well-organized national infrastructures in this field too.

## 25.2 ARCHAEOLOGICAL DATABASES

For a number of years here in Europe we have seen several archaeological databases being established and growing large, both as manual card-indexes and in electronic form. All of these have been created to meet a number of specific needs, and by their very nature they are primarily regionally or nationally orientated. Their main use will often be administrative, for which reason they are, as a rule, not intended for use in connection with international data exchange. But most of them have potential in this area too.

Many of the databases are linked to museums or central institutions with some museum-like function. In this respect, the individual European countries inevitably have their own different organizational structures. These run from a markedly decentralized structure as is found in Switzerland, through a regional one as in Germany to a more centralized one as, for example, in France or Denmark.

But why exchange archaeological data anyway? The answer is nearly as banal as the question. Because the somewhat arbitrary and continually shifting boundary lines of the present bear little relation to the peoples and cultures of prehistory. From Denmark, as a result, we are naturally interested primarily in establishing connections with archaeological databases in northern Germany and southern Sweden. But since archaeological objects often cover immense distances before they are deposited in the ground, the whole of Europe is, in principle, in our range of interest.



*European Archaeological Databases — Reality or Illusion? (Tove Nørgaard del.).*

### 25.3 DATA EXCHANGE

It is one thing to establish national databases and another to be able to exchange data between them. For this a number of conditions have to be fulfilled. A certain level of archaeological and technical standardization has to be observed, as well as the fulfilment of the physical requirements.

#### 25.3.1 Physical networking

The physical network (cables) that can be used for exchanging archaeological information already exist, primarily as the product of Europe's commercial life. But they can, of course, distribute culture-historical data too. Looked at from this side, at the moment we find ourselves in the rather paradoxical situation of it being in the uni-

versities that these networks are accessible while most museums lag some way behind. But the networks are there, and they are being massively developed at present as high-speed links, for instance using optical technology. Services such as file-servers and electronic mail are already available, and are used to connect research institutions via INTERNET, as the merged offspring of the European EARN and American BITNET is now called. For some of us, the use of e-mail has become a just as natural a feature of daily life as the fax and the phone are for others.

#### 25.3.2 Standards

The sets of problems that beset physical communication can thus to a very large degree be treated as solved, and the physical conditions for the exchange of archaeological data in mass form are, in

principal, met. Whatever the case, developments in this area continue on the whole outside our control and with relatively little regard to the museums' and universities' interests. We can therefore happily concentrate our attention on identifying, or perhaps developing, the standards relating to the contents of the databases that could be used as a basis for our international data exchange. This task is undoubtedly one of the greatest challenges relating to data exchange, and several organizations are already working in this area. A couple of examples will be noted here, but many more exist (Roberts 1992).

#### 25.3.2.1 MCN/CIMI

With respect to electronic data exchange, *The Museum Computer Network* (MCN) although outside Europe, must be mentioned, although for a while here we move outside Europe. MCN is a North American, now semi-professional, organization that can trace its origins back to the end of the 1960's. The original idea was to create physical networks between museums in the New York area, but, through the years, MCN has developed into far more as an intellectual network. Work aimed at creating real physical networking between the museums is, however, still going on. A concrete result of this is the CIMI project (*Computer Interchange of Museum Information*), which was started by MCN in 1990. The purpose of CIMI is:

«to develop a standards framework for interchanging all types of museum information via computer. The framework will allow museums to do the interchanges they imagine: exchange records, build common databases, and move information from one system to another» (Perkins 1992 p.130).

There is, of course, a long way to go before this can be done. But the philosophy behind CIMI is to identify already existing standards that can be used to this end, from simple ASCII text to the use of more complex methods such as SGML (Standard Generalized Markup Language), Abstract Syntax Notation One and MARC (Machine Readable Cataloging format), which is already used for bibliographical data. All four are recognized ISO standards. All kinds of museum data, text, pictures, numeral data and audio material, will, according to the plan, be included, and here too the idea is to identify existing methods and standards rather than to develop new ones. For pictures, for instance, there already are transmission protocols such as TIFF (Tagged Image File Format) or CGM (Computer Graphics Metafile) that can be recommended. Thus there may be every good reason to follow the same course as is

being followed outside of Europe and outside archaeology, even though it may be a long time before CIMI's own targets are met:

«The goal of CIMI is to produce an internationally standardized interchange format that will provide a means of transferring data from and to any sources required for museum purposes yet is independent of any one kind of software, one system, or one vendor» (Perkins 1992 p.132).

#### 25.3.2.2 MDA

Other organizations have worked more on the development of programmes and services for museums at a national level. A distinguished example is *The Museum Documentation Association* (MDA) in England. For several years this organization has worked amongst other things on the development of a common registration programme *MODES* for museums of all types, and has thus become involved in the development of classification systems and standards. This work has already culminated in an international conference held in 1991 on the theme of *European Museum Documentation Strategies and Standards*. The conference proceedings are being prepared for publication.

#### 25.3.2.3 AAT

Beyond the boundaries of Europe again, several years' work has gone into the production of classification systems, standards and thesauri of various kinds. One of the more monumental enterprises of its class is *The Art & Architecture Thesaurus* (Petersen 1990). AAT is an outstanding result for the resources that have been put into projects of this kind in recent years. It certainly seems as if art and architecture have the blessing of the funds and the grant-awarding authorities. *The Art and Architecture Thesaurus* of course cannot fail to be of great significance in its field, and has thus formed a prototype for other countries. Most recently an attempt has been made to adopt it, with modifications, in Romania (Cios 1992).

#### 25.3.2.4 CIDOC

Many of the movements described above are integrated in CICOC, the documentation committee of ICOM (The International Council of Museums). In pace with the steadily growing use of computers for registration in the museum services and the consequent growth of computer consciousness in this area, interest in CIDOC's work has increased greatly in recent years. CIDOC is, as a result, now one of the more important committees of ICOM. CIDOC's work has mostly been made public through a series of "working



groups", several of which are working on the identification and development of "standards". One of these working groups has already supported the publication of a *Dictionarium Museologicum* containing museum terms translated into 20 languages (Éri & Végh 1986). In its way, CIDOC is a classic example of international co-operation. It works, albeit slowly. A new CIDOC working group is specially dedicated to "Archaeological sites and international collaboration".

#### 25.3.2.5 European Museums Network

This must be the right place to mention a concrete example of international intermuseum co-operation, the *European Museums Network*, which began in 1989 and at present includes 8 different museums plus 2 "research institutions" and 2 "industrial partners". Half of the project's costs are covered by the RACE grant (from the EC).

EMN describes itself as «a pilot application in the field of advanced information and telecommunications technology». The general title of the project is *Discoveries — Traces of Europe's Cultural Integration*. The fundamental idea is to enable the user to navigate freely through the collections of the participating museums, directed and limited only by his own interests and mental associations. The data comprise text, pictures, videos, sounds, music and computer animations. Although there is not a lot of archaeology in EMN yet, the mere appearance and testing of such a system is an important step on the road to international exchange of data in itself. The participating museums range from art through maritime collections to ethnography and archaeology. All of them lie, geographically, on a nearly straight line from Copenhagen through Hamburg, Bremen, Bremerhaven, The Hague, Paris and Madrid to Lisbon. An archaeologist can hardly fail to speculate about this distribution map: does communication go best in straight lines? — A reminder of how careful one must be with distribution maps! The future of EMN, after the end of the pilot project in 1992, is not yet certain.

#### 25.3.2.6 EUARCH

This is the situation with the EUARCH project too, a project which began as a proposal for the establishment of a common database in the form of an electronic archaeological encyclopaedia. The principal idea was to make use of the enormous storage capacity that the family of optical media, CD-ROM, WORM and DRAW, now offer. Behind this proposal lay the slow publication and rapid obsolescence of traditional standard works such as, for instance, the *Reallexikon der Ur- und*

*Frühgeschichte* (Köhler & Schoenfelder 1991). The original notion of a regularly updated electronic archaeological lexicon, however, got a rather unfriendly reception, and the project was quickly recast to take as its starting point collaboration between existing "Sites and Monuments Records". The EUARCH project clearly reflects one of the most basic problems in the establishment of common archaeological databases: finance. If a sufficient number of influential institutions do not commit themselves to a given project, thus securing its financial basis, perhaps by way of support from the European Commission or such like, the chances of it surviving, however interesting it is, are very small.

## 25.4 EUROPEAN ARCHAEOLOGICAL DATABASES

Many people clearly nurture good intentions of creating common European archaeological databases. In this connection one might mention the French ArchéoData, which is described as «a method for structuring a European Archaeological Information System» (Arroyo-Bishop & Lantada Zarzosa 1992). But this is, after all, at the level of proposals and minor trials. The problems still look greater than the expectations. There is no doubt that significant exchange of information between archaeological databases will remain a Utopian dream for several years yet.

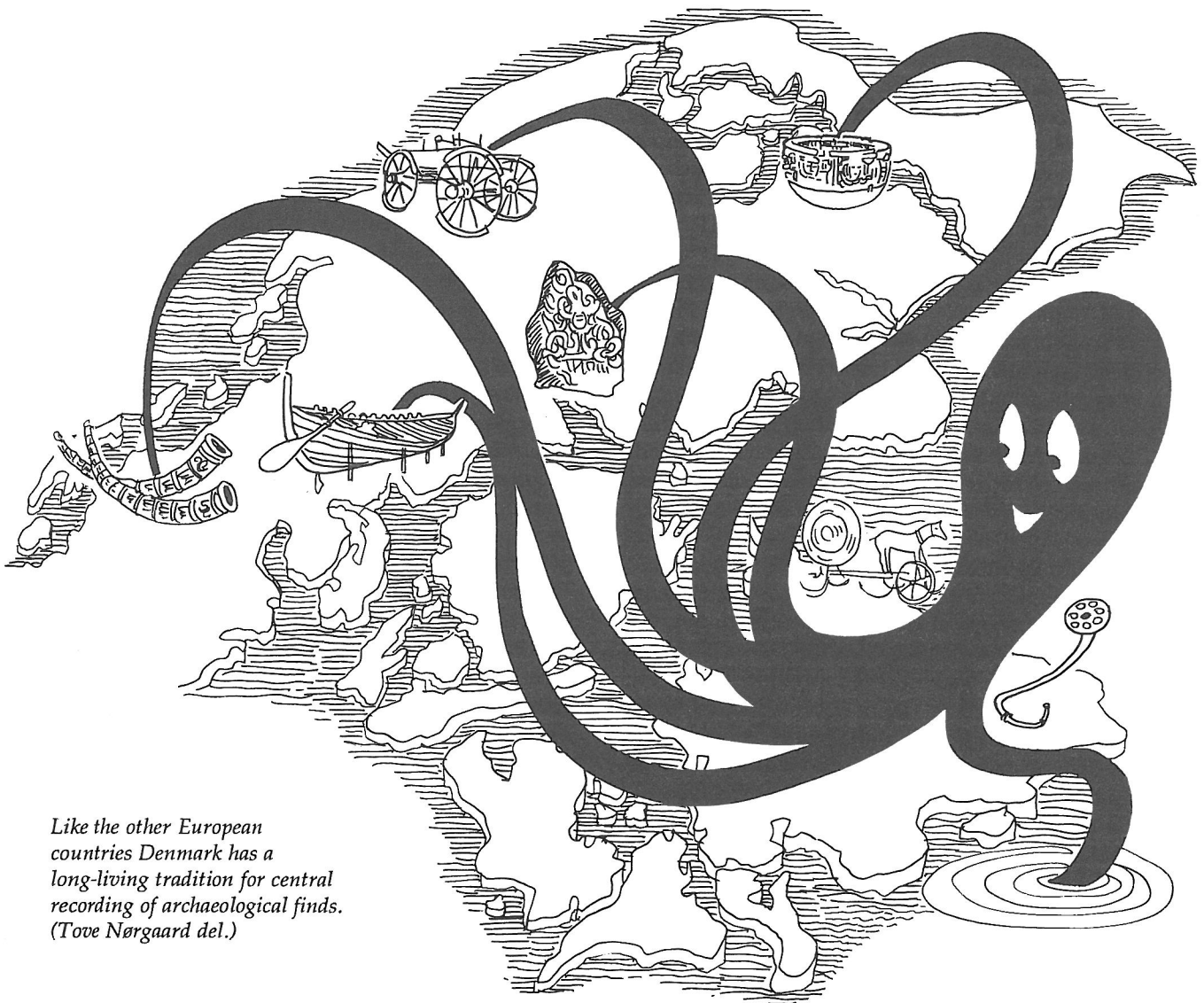
### 25.4.1 Sites and Monuments Records

But one area which would form a realistic starting point for further efforts are the existing Sites and Monuments Records.

Over many years, a great deal of work has been invested both nationally and regionally in the collection and structuring of archaeological information and in making it accessible in electronic form. The large number of records have, in a general way, all come about as the result of the same needs. Nevertheless they have developed differently according to the archaeological traditions in different countries.

The situation with the closely related but not entirely compatible European Sites and Monuments Records has a real analogy in the European Air Traffic Control Systems. Each country has developed its own system, often with several control centres. A number of these are overloaded, and many different programming languages are used. The traffic could, in principle, be dealt with much more quickly if the centres could talk to one another, but nevertheless it is assumed that it





*Like the other European countries Denmark has a long-living tradition for central recording of archaeological finds. (Tove Nørgaard del.)*

will take to the end of the century before a harmonized and integrated common European system will be a reality. This is a frightening thought when one thinks of the prospects for the exchange of cultural heritage data.

Nonetheless, a great deal in common was discovered at the first *National Archaeological Records Conference*, which took place in Copenhagen in the summer of 1991. Representatives of a number of national and larger regional Sites and Monuments Records (SMR's) took part in this, and so many shared features and common interests emerged so rapidly that the meeting could not fail to generate optimistic feelings about the possibilities of future collaboration on the exchange of archaeological data at this level.

The papers from the conference have just been published, so I shall not waste space on a general survey of the individual SMR's and their structures. See the various papers in the book

(C.U.Larsen 1992). I will, however, pick out certain points.

Looked at on a European basis, the interest in collecting archaeological objects as well as other curiosities emerged in the course of the 16th and 17th centuries. This led to the foundation of the so-called "cabinets of rarities" in European stately homes and thus, really, to the emergence of museums. In the wake of this came more and more systematic collection of information about ancient monuments, with the result that everywhere in Europe we have old, and precious, information about archaeological objects and the contexts in which they were found. This information later came to form the backbone of several SMR's, including our own Danish one (Christoffersen 1992; Jarl Hansen 1992a; Jarl Hansen 1992b).

All the European SMR's have developed according to roughly the same plan. Their archaeo-

logical basis is the written result of centuries of collecting of antiquarian information, naturally varying from country to country according to antiquarian traditions. In Denmark, we are lucky enough to have a systematic, nationwide description as a starting point, but on the other hand we do not make any great use of literary sources or air photographs as is the case in England (Aberg & Leech 1992). This is one effect of practical circumstances and scholarly tradition.

The technical basis for electronic SMR's was established of course with the general adoption of computers in society at large. Data processing machines have gradually become an accepted part of European daily life. It is therefore no surprise that several electronic SMR's were founded at the end of the 1970's, while some can be traced back to the end of the 60's, as manual, card-based registers (Lang 1992).

From here, development has been rapid. From the beginning, the different SMR's were primarily intended to be a practical, administrative tool, with data organized in a "flat file structure". But when relational databases and more powerful machines were introduced in the mid-1980's, it was a natural step to abandon the existing structure of the records and to undertake re-organization in accordance with the more complex database tools.

The entirely new search facilities of databases, combined eventually with the presence of a great quantity of archaeological data, led at this point to the emergence of a desire to be able to use SMR's for research purposes and not just for administrative jobs.

In very recent years the powerful Geographical Information Systems (GIS) have been introduced, and the very promising prospects of combining archaeological and geographical data are clear. Although GIS is quite a challenge, it has already been put into use in several places, for instance in Holland, England and France (Roorda & Wiemer 1992; Harris & Lock 1992; Guillot 1992).

It is really at the present state that, for the first time, we can sense the need to be able to see beyond our own borders. We thus return to the problem of international exchange of archaeological data.

In practice, the European SMR's are following different lines of development, depending upon the local level of funding, although they are apparently all following the same culture-historical path, a phenomenon parallel to that of the archaeological material they are meant to reflect.

Let us take a familiar analogy: the megaliths of western Europe. These outstanding stone struc-

tures are, as we all know, distributed widely from Scandinavia to Malta. They appear in many different shapes and sizes, but they reflect common ideas about life and death. And of course their construction carried the individual touch of the local society too. The situation with the SMR's of Europe is precisely the same. After some time they grow to be monuments in themselves. And as in prehistory, their size and shape reflects the power of the local political chief.

If now the European SMR's were linked up in an effective network, it would have been possible for me to have drawn a distribution map of all the known European megaliths to use here. Thus you can judge for yourself how far this example is relevant, or mere twaddle.

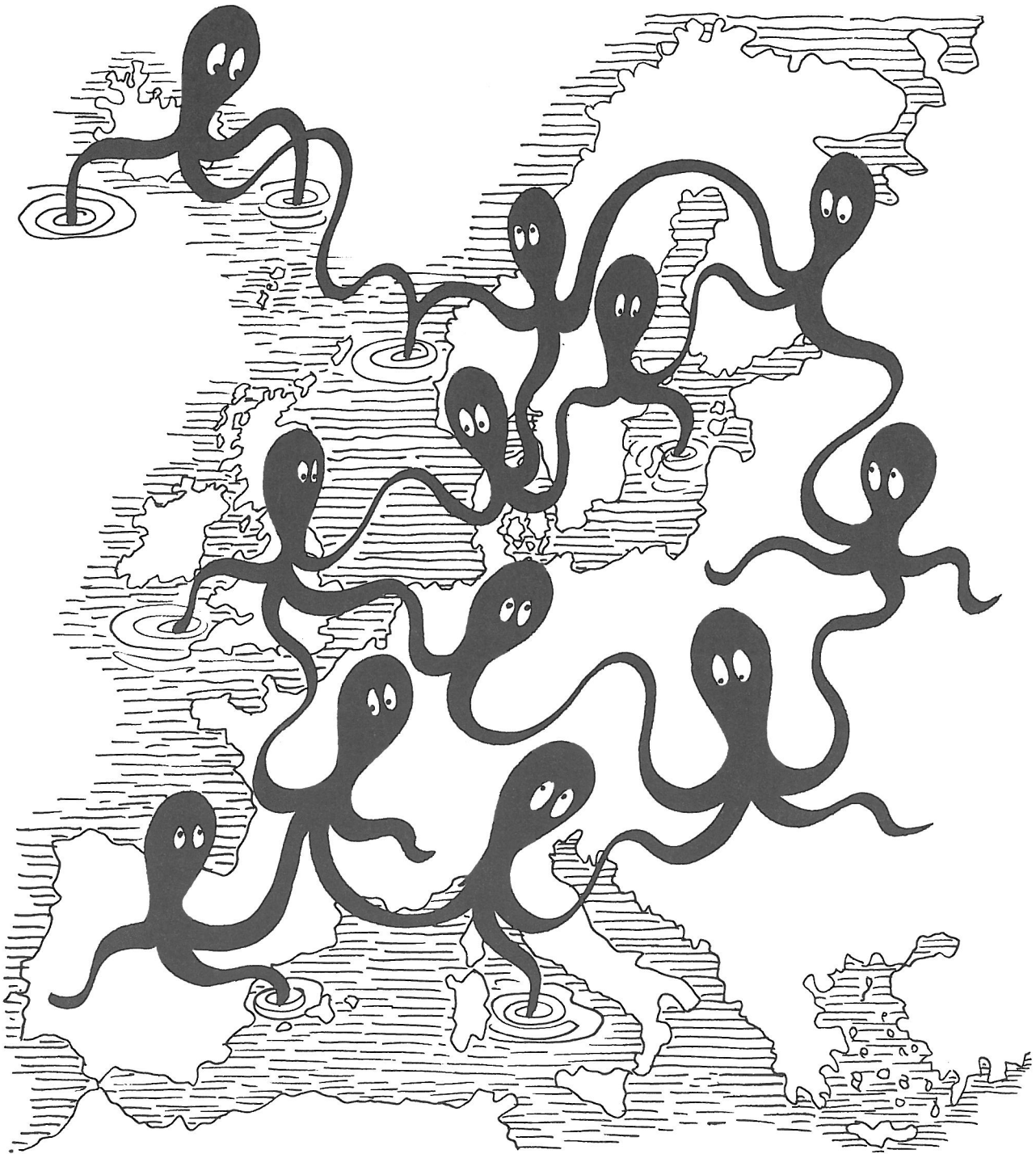
The next necessary step must be to include pictures, extensively, as a further source of information in our SMR's. Pictures for reference will be of invaluable significance both in the use of the records for research and in future data exchange. But we are still at the experimental stage in this respect.

Before this castle in the air becomes too large, however, it is necessary for us to tackle a very real problem, shared by all SMR's: the assembling of data. To undertake the recording of basic archaeological information originally planned is extraordinarily time-consuming, and none of the established SMR's at present can really be said to reflect the true archaeological reality, nationally or regionally. One could easily argue, as a result, that until this situation is changed radically it will continue to be of little relevance to start work on international data exchange. In my view, however, it would be a serious mistake not to get started now, and thus to guide future developments into a profitable course.

By starting now, we could, for instance, ensure that the development of our SMR's was less system dependent, and enjoy the benefits of experience mutually. All of us, in recent years, have had the experience of having to change from one soft- or hardware platform to the next, and this is going to happen again and again and again.

We will thus be compelled to take some truly concrete steps towards collaboration, and the first groping attempts have already been made, for instance in the establishment of the "Archaeological Sites Working Group" under CIDOC described above. Only when we have seriously got under way will it be possible to identify the many substantial problems. Some of them, however, can be seen in advance. These include, for instance, geographical references, which naturally vary from area to area. Many use the UTM (Universal





*The Perspective. A network of European Sites & Monuments Records (Archaeological Databases). (Tove Nørgaard del.).*

Transverse Mercator Grid) system, but not all. Conversions from system to system can be undertaken, and the *Bonn Archaeological Database*, for instance, has a lot of experience in this area (Scollar 1992). The problem of archaeological data will be a much harder one. Neither cultures nor periods can be directly translated by means of a simple conversion programme. Here a bridge has

to be introduced in the form of an interpreter for the individual databases. In respect of datings, one could imagine that particular terms could be related to a common archaeological chronology scale instead of aligning oneself exclusively to the three-age system and its subdivisions. Terms such as Iron Age, Middle Ages and "Dark Ages" could be comprehended and put into the differ-

ent terms that would be comprehensible across Europe. While the lusty Scandinavian Vikings were having their work cut out for them in reaching America, southern missionaries were making strenuous efforts to convert the pagans left behind in the north and thus finally to drag them out of the darkness of local prehistory into the light of history that had been shining in the south for centuries.

An issue as fundamental as the languages used in the participating SMR's has to be solved, for one can hardly expect the average user to cope just as easily with each and every one of the European languages. The systematic and extensive use of icons and pictures could be a real step forward in this area, as planks in an interpretative bridge.

These could also be useful as an explanation of the large and varied number of structural types identified. A certain amount of harmonization between the terms used would be desirable, although this can be difficult. A good starting point for this can however be found in the thesaurus of over 3,000 terms for "Archaeological Site Types" that has just been published by the Royal Commission on the Historical Monuments of England and English Heritage (RCHM & EH 1992).

#### 25.4.2 Utopia

The ideal situation in the future would be that one could treat the participating Sites and Monuments Records as a large, common European database, in which one can move around freely and at will, whether, as an ordinary user, one simply wishes to explore our shared prehistory or, as a researcher or administrator, wishes to clarify particular problems. Basically, one would have access to information on archaeological finds and ancient monuments in the form of text, drawings and photographs. Data, of course, could be dealt with geographically, with productive access to relevant scientific sources of information. One could also find references to publications in the database(s) (indeed the literature itself if the problems of copyright can be solved), air photographs, film clips, video and perhaps sound. In the latter category we might find famous archaeologists reading their own works out loud.

#### 25.4.3 Reality?

Let me confess — I don't myself really believe in this ultimate vision. But something less would do.

We have at least to take the attitude that the future development of European SMR's should go beyond the purposes of planning and preser-

vation. They should contribute to education, presentation and not least in research. It is precisely for this reason that it is so important to make progress in international data exchange.

With this, we will be in a position to use our SMR's as a very advanced index of European prehistory. The electronic records will never be able to substitute for the real material, nor should they. But they can help to provide an overview of topics as desired and can function as guides to the sources as well, indeed as an instrument with which new ideas can quickly be checked out.

As indicated earlier, the problems of establishing international contact do not lie in the technical field, although this can be difficult. The great challenge and greatest obstacle is and remains archaeologists themselves. So this is certainly not going to be the last time that this topic will be discussed and written about in the forum of the CAA. It is to be hoped, however, that we will be able to look back at 1992 as the year in which we really got a proper grip on this issue, its problems and its opportunities.

Translated by John Hines

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