

TOWARDS AN AUTOMATIC ARCHAEOLOGICAL DATA PROCESSING SYSTEM
APPLIED TO NEOLITHIC SETTLEMENTS

(A Preliminary Report)

Serge Cleuziou
Jean Paul Demoule
Anne Duponcel

Unité de Recherche Archéologique No.12
C.N.R.S. 23 Rue du Maroc,
75019 Paris.

The Unité de Recherche Archéologique No. 12 of the French C.N.R.S. has undertaken the construction of an automatic archaeological data processing system (C.A.T.I.A.), to be applied to the study of french neolithic sites. This system involves: (1) Data input in the field (real time), (2) Guiding of the excavation with the results of preliminary data processing, (3) Automatisation of usual archaeological procedures for data analysis and (4) Automatic editing of stored information and of the results of analysis.

The archaeological problem

The Aisne Valley, 100km. to the north of Paris, will be destroyed during the next ten years by gravel-extraction, the construction of a new canal, two motorways and by industrial and urban development. Several hundred sites, from the Neolithic to Roman periods, have been located by aerial photography and ground survey.

The controlled rescue of a certain number of these sites has been undertaken through a joint project of the U.R.A. No. 12 the Aisne Department, University of Paris I and the Secretary of State for Cultural Affairs. In particular, it is necessary to 'save' the neolithic sites, the oldest in the Paris Basin, the majority of which have already been destroyed in the Yonne, Seine and Marne valleys. In fact nothing is known about either the socio-economic organisation of these first sedentary villages or their settlement pattern.

The main problem is to measure the distortion of the socio-economic model elaborated for Central Europe - the Aisne neolithic originating from this region - in particular that of the Bylany excavations.

Over the past three years, almost 1 ha. of the neolithic village at Cuiry-les-Chaudardes has been excavated; those at Villeneuve Saint Germain and Pantavert have been less extensively dug. A dozen other neolithic villages are known from small soundings and prospection.

The villages consist of houses with five rows of posts as well as numerous pits; most of these, originally dug to provide clay for the house walls, served as rubbish pits for the houses; also silos, palisades and occasionally burials. The pits contain pottery, animal bones and lithic remains. At least thirty thousand objects have been uncovered through excavation.

The computer project

The first stage involves the day-to-day registering of excavation data. Descriptive codes are used, allowing analysis of pottery and structures, and ultimately of the animal bones, lithic

material and sediments. We have benefited from the experience of Czech archaeologists at Bylany. Thus each sherd is analysed under sixty variables, whose relevance to cultural interpretations has already been partly tested.

The material is thus coded as it is discovered then stored through the intervention of a teletype situated a kilometer from the site and linked to the I.B.M. 360-70 of the Centre Inter-Regional de Calcul Electronique at Orsay, 200 km. away. As the program is too complex for the different documentary systems prospected, we decided to set up an ad hoc system, whose structure corresponds to the hierarchical organisation of archaeological data. During a transitional period, the data are registered in a sequential system accessible through a conversational input program. This program allows the input of each item, category by category, with subprograms to check for errors. This program is structured as a "questionnaire". Simultaneous data input is also possible. The first tests were carried out in August 1974 on several pits of Cuiry-les-Chaudardes and give satisfactory results.

Current Work

This first stage is inseparable from the following: the ability to converse with the Data Bank during the actual excavation, the processing of data and the definitive editing of the primary information with the least delay. The process uses a certain number of statistical tests which organise the primary information in a series of matrices. It is possible to ask certain specific questions applicable to one or several structures. Programs which exist at the Centre de Calcul de la Maison des Sciences de l'Homme (Paris) will be used for the editing.

As well as offering considerable practical advantages - considerable reduction of processing time, feedback between the first results of analysis and field-work - this project is of great methodological interest. On the one hand it shows that most data processing in archaeology - at least for the neolithic period - involves a simple documentary operation which can be greatly simplified by modern techniques. On the other hand the archaeologist is obliged to formalise his approach to the use of these techniques, as much in the process of reasoning as in the description of data.

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