CAA89 — COMPUTER APPLICATIONS AND QUANTITATIVE METHODS IN ARCHAEOLOGY

CAA aims to bring together archaeologists, computer scientists and mathematicians, to encourage communication between these disciplines to give a survey of present work in this field and to stimulate discussion and future progress.

It began as a one-day conference on computer applications in archaeology in Birmingham in 1973. From that small beginning it has grown into a successful international event. This year the conference was attended by over 150 delegates, one fifth of whom were from overseas. CAA89 was held at the University of York from 21st to 23rd March and fifty two papers were presented in parallel sessions over three days.

Professor Martin Carver, of the Department of Archaeology, University of York, gave the keynote address. He reviewed the subject of 'Computers, statistics, and the field profession'. He suggested that computers can alter our perception and change the way we think about the past, which may or may not be a good thing. He concluded with the hope that we can « encourage guesswork, curiosity and a sense of adventure in front of a terminal ».

The conference then moved on to sessions on: The organisation of archaeological computing; Surface and solid modelling and image enhancement for archaeological data; Statistical applications; County sites and monuments records; Graphics; National developments; Recording systems; Publication; Training and education; and Expert systems and artefacts.

In the solid modelling sessions, Paul Reilly from the IBM UK Scientific Centre inevitably had the most spectacular graphics at the conference. He and Jeremy Huggett (then with Hereford and Worcester County, now an Archaeological Computing Consultant) presented their work on Mathrafal, a Dark Age and Medieval site in Wales. They undertook a program of remote sensing to determine the optimum excavation strategy. They used EDMs (Electronic Distance Measurers) for the topographical survey and also took resistivity and proton magnetometer readings.

Each survey involved around 15000 readings. The topographical data were represented as a wire-framed surface and displayed on an IBM 5080 workstation. They could then rotate the image and pan across and zoom in or out in real time. The same process was attempted for the geophysical data, but found to be unsatisfactory. The resistivity and magnetometer readings were enhanced using the IBM IAX image processing system. This exercise brought to light indications of what may be a building, an oval palisade and two kilns. This possi-

ble interpretation was then modelled using WINSOM, the WINchester SOlid Modeller.

In his second paper, Paul Reilly presented a video sequence of the rotation of a model of an excavation site. The model was produced by WINSOM and sent to a video recorder by a Spaceward Supernova Framestore/Animation Controller. Each revolution of 360 degrees took 24 seconds and required 600 frames to be generated. Each frame is a 1 megabyte image.

IBM has the computing power and money to undertake projects such as these, but there is a great deal of valuable work taking place on much more slender budgets. Martin Carver described his work at Sutton Hoo and advocated the use of low tech solutions which can be used by MSC (Manpower Services Commision) people who are only on site for 2 or 3 weeks.

When Sutton Hoo was excavated in 1939, archaeologists found the imprint of a massive ship, buried beneath a large circular mound. The boat was buried about AD625 as the grave of a king and originally contained a wonderful collection of treasure. The three mounds on the site have all been robbed in the past, and Professor Carver's recent excavations found only fragments and a set of impressions in the sand. Measuring large ephemeral shapes in 3 dimensions presented a problem — the ship is 90 ft long. Photogrammetry was too expensive. Smaller shapes can be moulded using silicon rubber and then fibre glass positives, but still need to be digitised for analysis. To record the images of 'sandmen' in graves on the site, he used a 3Space tracker, a 3D digitising device developed by McDonnel Douglas, but there is still a place for traditional methods.

The conference included a number of contributions from overseas. Daniel Arroyo-Bishop from U.E.R. D'Art et D'Archéologie, Paris, France, presented a report on archaeological computing in south-western Europe. The countries of Northern Europe have had a similar development to their Anglo Saxon neighbours, but in the countries of south western Europe computer usage is much more recent. In this area, he says, « The use of computers is a privilege, not a necessity ». Although development in France, Spain, Portugal and Andorra started later, they are catching up quickly.

Computing in archaeology in France began in the 1950s, but there was a lack of government interest. There has only recently been a co-ordinated research effort on a national scale. One product of this is the ArcheoDATA project, which is a system for storing archaeological data. It includes the novel idea of using the bar codes that we are more used to seeing in the supermarket as a means of classifying and identifying artefacts.

Professor Ozawa, from the Osaka Electro-Communication University in Japan, presented a rule based system for dating artefacts. His pilot system,

ERAPS includes an empirically acquired knowledge base of rules and an inference engine. ERAPS provides automatic dating for a given class of artefacts and can be tuned up during use by the archaeologist. During the poster session, Professor Ozawa also showed computer graphics pictures of ancient Japanese keyhole tomb mounds.

John Wilcock (Department of Computing, North Staffordshire Polytechnic) presented his work on the analysis of ancient Chinese pottery and porcelain shapes. He also described the progress of computer archaeology in China, based on his experience of working in China with Professor Gao Liming, the first Chinese national to undertake methods of computer archaeology, and his research student Luo Hong Je. Although archaeology itself has a long history in China, computer archaeology was only recognised as a discipline in the early 1980s. This is a consequence of China's slow computerisation rate, lack of hardware and lack of access to Western research.

The analysis of pottery shapes was carried out using computerised profile data reduction, cluster analysis and fuzzy boundary discrimination.

I have mentioned seven papers out of the fifty two given. The subjects covered were many and varied and in addition to the formal sessions, CAA is also an excellent opportunity to meet people in the same field for more informal discussions.

VANESSA B. BLAKE