

VII Samenvatting

The Second Maastricht International Flint Symposium

Results and Conclusions

by G. de G. Sieveking (*British Museum*)

For four days in May 1975 the town of Maastricht was once again the host to an International Scientific & Archaeological Symposium on Flint, the most important raw material used by man for 99% of the long period of his existence in Europe, probably at least one million years.

The Maastricht Flint Symposium was originated by our hosts, the members of a local branch of the Netherlands Geological Association, who were particularly concerned with the occurrence and the character of the unique raw material in the Maastrichtian and other Cretaceous formations in Limbourg, and in its exploitation by Prehistoric Man. One section of the local Geological Association, the Prehistoric Mining Workgroup, specialised in the discovery and investigation of the underground prehistoric flint mines of the Rykholt-St. Geertruid complex. From the beginning in 1969, therefore, the Maastricht Flint Symposium had assumed a truly international character, with the assistance and collaboration of scholars and scientists both from those countries - France, Belgium and Germany - who shared a common frontier with the Netherlands and whose archaeological and geological problems were closely related, and also with countries further afield. As Cretaceous flint is found over most of Europe from England to the Crimea, and from Scandinavia to Morocco, wherever chalk is found, so in 1975 visitors to the Maastricht Symposium came from many countries, and reports and papers represented countries in East Europe, such as Poland and Hungary, as well as a contingent from England. The Netherlands itself was represented at Maastricht both by the most distinguished archaeologists, including Professor Waterbolk and Professor Modderman, and also by an impressive group of physicists and geologists, in addition to local representatives. It was plain that the Maastricht Symposium has been accepted by the scientific and learned institutions as a specialist institution for the study of Flint, like the International Congress of Glass Studies and others of their kind; a suitable place for the exchange of information on the frontiers of knowledge.

Specialist bodies of this sort, where those interested in a single subject such as Flint can come together, are a most important development as there are so many people engaged in the sciences of Archaeology, of Geology, and of Physics and Chemistry that there are real problems of communication in the individual sciences, as well as between them. The International Congress of Prehistoric and protohistoric sciences, to be held at Nice in 1976, expects to have more than 5,000 archaeological visitors. Geologists and physicists visiting the Congress could not hope to discuss common problems with the archaeologists. It is also quite plain, from the papers delivered at Maastricht in 1975, that the study of Flint, like the study of Glass or Metallurgy, requires geo-chemists and physicists who have special knowledge of its origin and characteristics, just as much as it requires archaeologists who have special knowledge of its origin and characteristics, just as much as it requires archaeologists who have specialised in mining techniques.

It is particularly fortunate that Maastricht consented to

act as host to the Flint Symposium, because at Maastricht originated the new movement in archaeology for the study of prehistoric mining techniques, which is one of the most important recent developments in prehistoric archaeology. This was reported on at the first Symposium. In 1975 a further progress report was also made of the study of mining techniques, this time at the Grimes Graves Flint Mines in Norfolk, England, where the Maastricht Workgroup have been engaged in a combined operation with British Museum archaeologists. However, though there were archaeological reports at Maastricht in 1975, including the new discovery of a surface flint axe manufactory, and some interesting studies of flint working techniques, the main reports of the Symposium concerned the geological origin of flint and the recognition that flint contained certain chemical elements, which might enable lumps of flint from different localities to be distinguished from one another. Chemical analysis of flint to detect and measure these elements and the discussion of the results occupied one full day in the middle of the Symposium.

However, this day was preceded by two full days of Geology. A first day was allotted to the study of the stratigraphical position of the flint in the Maastrichtian chalk and other Cretaceous formations in the district, and to a discussion of the types of environment under which the Maastrichtian chalk was deposited in the sea.

Discussion of the evidence for field geology included one of the first unexpected benefits of the Symposium in the form of a paper (printed in this volume) from Richard Pollock, a British Petroleum geologist, who had spent several years studying the Maastrichtian chalk, and put forward theories as to its formation which differed from those accepted by the local geologists.

From a discussion of Maastrichtian chalk the Symposium moved to a discussion of the geological origins or genesis of flint itself, still a much-debated subject, on which it is possible to hold many opinions. Here a strong contribution was made by a local scientist, Ing. P. J. Felder, who produced a practical typology, dividing flint up into a number of different types according to the manner in which it occurred in the exposures in the rock, and postulating separate methods by which the flint had formed under differing field conditions. Mr. Felder's paper was supported both by many slides, and also by a magnificent exhibition of specimens of different types of flint which he had collected and photographs of characteristic exposures very kindly put on by the Maastricht Natural History Museum for the benefit of the Conference.

In addition to Mr. Felder's paper, a fine theoretical paper by Dr. Buurman (printed here) summarised the general position with regard to the genesis of flint in the chalk and provided a basis for the later discussion on chemical trace elements in flint. As was pointed out in later papers on flint analysis, the chemistry of flint must be related to the chemistry of the deposits from which it was formed, any uniformities of chemical composition which might enable the flint from one district to be distinguished from flint from somewhere else, have to be looked for in the rocks surrounding the flint. You cannot study flint without studying the chalk close to it!

In the discussion of flint analysis, major contributions were made by Dr. Bush and Dr. Ferguson of Imperial College, England, summarising the work of analysis in Great Britain (already published in *Archeometry* 14, 2 65-79 1973) and by Dr. Bakels summarising and interpreting the work carried out by Dr. Bruin and his collaborators at the Delft

Reactor. Dr. Bakels' paper it was agreed was particularly impressive for truly scholarly caution and restraint which she showed in her interpretation of the Delft Laboratories' results.

On the afternoon of the third day of the Symposium, we finally moved to a discussion of man's utilization of this raw material, with discussions on how flint was fractured, and on the stone hammers it was hit with, and later in the day an experimental session was held at which demonstrations of various types of flint tool manufacture were undertaken both by Netherlands and by British flint technologists. A final day's discussion was held on the subject of the prehistoric flint mines where the flint was held on the subject of the prehistoric flint mines where the flint was extracted for manufacture into tools and weapons.

We had already heard from Mr. W. Felder about the investigation of the Rijkholt Flint Mine near Maastricht and we had visited the site of this important monument. Papers were also delivered from flint mine specialists in other countries, Poland, Hungary and Great Britain, which emphasised the importance of the study of these monuments.

Can we summarize the results of the 1975 Symposium? I would like to sum up certain scientific discussions and make one or two general points. The discussion of the origins of flint was most valuable. There does seem now a possibility that we can achieve agreement on a general overall view of the origin of the silicious rocks in cretaceous chalk, put forward so ably by Dr. Buurmann, into which can be assimilated in modified form at least some of the distinctive field occurrences described by P. J. Felder and illustrated in the Natural History Museum Exhibition. As a result of the discussion it seems established that we must regard flint as a chert as described by Dr. Buurmann. But we recognise that it is a special variety of chert which is homogeneous in its trace element content horizontally, for reasons associated with its depositional environment; that is to say flint is similar over wide areas horizontally, but differs vertically (P. Bush). This emphasis on the geological reasons why we find what we do in the

flint remains a most important point.

Another most useful lesson has been the importance of experimental studies in archaeology. Speaker after speaker described experiments in reproducing conditions they had discovered, and then we had some actual flint demonstrations which showed how useful this work could be. This is a form of archaeology which shows great signs of cost-effectiveness at the moment. I feel that experiments can be designed to reproduce all sorts of problems we have not yet considered.

The importance of flint mine studies also received considerable emphasis and here again it seems is a problem that has so far not been undertaken seriously and one which promises to produce results of great value. It appeared from the Symposium that these flint mine studies were now being carried out scientifically in many different countries for the first time. We heard from colleagues in Poland, Hungary and Switzerland how important flint mine studies were for the study of prehistoric culture and economy. The flint mines are the relics of man's first real industrial activities, and among the largest prehistoric industrial monuments known to archaeology. Taken together with the flint knapping areas found on the surface of the ground nearby the underground mines and shafts occupy many hectares.

The Symposium emphasised the importance of the work which has been carried out at the Rijkholt Flint Mines by the Maastricht Mining Workgroup. Their work is of more than local or national importance. The discoveries that have been made at Rijkholt were the result of employing specialists in mining, rather than specialists in archaeology. For the first time real evidence has been recovered of the existence of a complex patterned mining technique of prehistoric times. The Rijkholt flint mines are therefore very important for advancing the knowledge of prehistoric economy. It is heartening to be able to record that as a result of a resolution passed at the conclusion of the Maastricht Flint Symposium the Netherlands Minister of Culture has been approached to preserve the Rijkholt Prehistoric Flint Mines as a National Monument, and that this initiative shows every sign of success.