Françoise Bostyn and Yves Lanchon (eds), ]ablines, Le Haut-Château ( Seine-et-Marne ) : une miniere de silex au Néolithique, with Andrzej Boguszewski, Catherine Frugier, Sylvie Jérémé, Luc Laporte, Stéphen Vacher, Carlos Valero, Paris: Editions de la Maison des Sciences de l'Homme 1992, pp. 246, 231 figs. + 1 insert. "Documents d'archéologie française" nr 35. Archéologie et grands travaux.

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## Reviewed by Jacek Lech

In the relatively short history of prehistoric archaeology the excavation of flint mines was always regarded as a difficult field, and were rarely attempted. As a rule work of this type is often dictated by rescue situations, or the needs of site conservation or museum display. It is still even rarer that the scientific community receives the publication of such work within a short time. An exceptional example of such an investigation are the French excavations at le Haut-Château at Jablines (Seine-et-Marne) conducted under the direction of Françoise Bostyn and Yves Lanchon.

The investigations of 1989–90 were rendered necessary as a result of the construction of the high-speed railway track (TGV-Nord). Two years after the completion of the excavations we have received a book detailing the main results of these investigations. This monograph is a collective work of a fifteen-person team of the Association pour les fouilles archéologiques nationales (AFAN).

The volume begins with a preface, and introductions (pp. 10-3) by the director of the project of TGV-Nord. The body of the book consists of seven chapters, three appendices, bibliography and summaries in French, German, English and Polish. In Chapter 1 (pp. 15-20), the geographical position and geology of the site are detailed, the history of investigations, and the basic information on the rescue work undertaken. In Chapter 2 (pp. 21-30), the problems of the investigations of prehistoric flint mines are sketched, and the example of Jablines is placed in its European and French context. Chapter 3 (pp. 31-56) presents the results of investigations by scholars of the natural sciences who characterise the conditions of exploitation of the raw material.

The main body of the work consists of Chapter 4 (pp. 57-122), this has the title "The system of the exploitation of flint", it is divided into five sub-chapters: the first of these is concerned with the typology

of exploitation structures. This is richly illustrated with profiles, plans and photos of shafts and niches. The next subchapters deal with the spatial differentiation of the exploitation units, their efficiency, tools of deer antler and their utilisation in work underground, as well as the surface structures identified in the area of the mining field. On the basis of the area examined the authors differentiate exploitation pits, extraction structures with chambers (more correctly referred to as niches), bell-shaped extraction structures, and those with underground galleries. The latter may be additionally subdivided. Analysis of the spatial differention of the exploitation units is based on the method of Thiessen polygons (pp. 89-96). The quantity of mining waste from different types of deposit and by different techniques is a question which has interested investigators since the middle of the 20th century, and bearing this in mind the excavators of Jablines utilised a computer analysis of a system of measurements of the excavated units which they compare with the calculations of P.J. Felder for the mines at Grimes Graves and Rijckholt-St. Gertruid (pp. 97-101). A separate subchapter is devoted to the tools of antler and the techniques of cutting through the bedrock, against similar evidence from other sites (pp. 102-20). In contrast to the mines at Spiennes and Rijckholt relatively nearby, at Jablines antler and, to judge by traces in the limestone, wooden tools were in the main used. Flint tools, such as the picks known from mines in Belgium and Holland were not found. The publication contains an interesting formal-functional classification of the antler tools.

The brief (pp. 123–9) fifth chapter presents the finds of bone and ceramic. The pottery found belongs to the Neolithic (Cerny and Middle Neolithic II). A number of ceramic finds however could not be more closely classified.

The next, lengthier, chapter (pp. 131–210) contains a multiaspectual analysis of the working of the flint in the mining area. This contains many drawings of high quality of primary axe roughouts, axe roughouts and axes (which were however not polished in the mining area). The flint waste comes from a few chipping floors preserved in natural hollows or in the fills of mining features. During the excavations several tonnes of flint waste were recovered. Since it was possible, due to the restrictions of funding and lack of personnel, it was only possible to spend six months on examining this material, attention was concentrated on a general spatial analysis of the material, as well as more detailed studies of three carefully-selected groups.

Flint was extracted at Le Haut-Château mainly for the production of bifacial axes with lentoid section, these were made in two main size groups. The exploitation of the flint was the beginning of a series of technological processes leading to the production of these tools. The examination of the waste from these processes attempted to reconstruct the whole production cycle in the workshops in the mining area.

The final chapter is titled "general synthesis" and contains not only a summary of the results of these investigations, but sets them in the context of other similar mining sites and complexes in Europe. The authors examine Jablines in the context of other sites such as Rijckholt–St. Gertruid, Spiennes, Grimes Graves, Krzemionki Opatowskie (and other sites in Poland).

The monograph closes with three appendices. The first presents material from a Bell-Beaker grave found in the mining area (pp. 224–9), the second considers the details of the computer processing of the metrical data from the shafts allowing their three-dimensional graphic presentation, which is one of the notable features of the book's illustrative content. The third appendix considers the radiocarbon dates of the mines. The bibliography (pp. 235–9) apart from works of French archaeologists contains a good selection of works concerning general aspects of Neolithic flint mining in Europe.

The presented monograph is for several reasons exceptional, just as the investigations they report themselves were exceptional. In the span of four years very large scale investigations of a flint mining complex were planned and carried-out, and then the results were processed and competantly published. This task was difficult both from the meritorial and technical points of view. It is obvious that to achieve this the excavators Bostyn and Lanchon must have had to make many decisions on the treatment of the evidence which in other situations may well have been treated differently. For example, it is possible that had the ploughsoil been removed by different methods, it may have been possible to locate in its lower parts remains of waste-heaps and knapping-floors. Additional observations of the micro-stratigraphy of the base

of the shafts and in the side-workings may have allowed more detailed examination of individual behaviour connected for example with the organisation of work. The more detailed examination of the waste flint (taking into account a greater number of attributes and classified categories) would probably have given a fuller picture of flint-working at Jablines and the possibility of greater differentiation of the behaviour associated with it, detectable in the structural characteristics of the inventory. Despite these remarks however it must be strongly stressed that even despite the rescue nature of the investigations, we are presented with an exceptional piece of work, both from the point of view of the organisation and execution of the field investigations, but also in the quality of the final publication.

A few words about the editorial side of this monograph. Its logical layout invites attention, it is very clear and concise. The work is exceptional in its excellent graphic content, good photos and even better drawings. It is regrettable however that the general views of work in progress showing the scale of the investigations were published in an over-reduced format (figs 8–10). Of the terminology used in the work one feels a certain reservation about the term *chambres* for the quarrying in the side of the shafts in simple mines. This term however seems more suitable for the sort of underground workings seen in Shaft 4 at Krzemionki Opatowskie. The workings at Jablines are typical niches (as was appropriately translated in the Polish summary, p. 243), it seems that in these cases the French term *niche* would be completely appropriate for them.

The debatable points noted above however do nothing to detract from the great value of the discussed monograph. Such high quality publications of prehistoric mining complexes investigated on such a scale in Europe are very rare. France has a large number of prehistoric flint mining complexes, investigated on various scales since the mid 19th century. Until now however there had been a lack of investigations on a suitable scale and modern publications concerning them. This is why "Jablines, Le Haut-Château" is an even greater achievement, and is one of the classics of the European literature in this field; it may also serve to set a standard for future publications of this type, not only in France.

Translated by Paul Barford