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BOOK REVIEWS

Wojciech Brzeziński (ed.), *Kopalnie krzemienia na stanowisku „Za garncarzami" w Ożarowie* [Flint mines at the "Za garncarzami" site in Ożarów], Warsaw 2020, Państwowe Muzeum Archeologiczne w Warszawie, Wydawnictwo Naukowe – Uniwersytet Kardynała Stefana Wyszyńskiego, pp. 280 + CD; 108 illustrations; 28 tables; 60 plates

Reviewed by Hubert Binnebesel[a]

In 2020, the Publishing House of the Cardinal Stefan Wyszyński University in Warsaw and the State Archaeological Museum in Warsaw released a monograph dedicated to a mine site named "Za garncarzami" in Ożarów (Opatów distr., Świętokrzyskie voivodeship). This publication was an outcome of the project aimed at summarising the results of studies carried out in the mining field in Ożarów in the years 1979–1991. It was also an attempt to interpret these results employing modern methodology and available techniques. This publication has filled up the gap in our knowledge of this site, since before its release the results of such research had been announced only as short articles (e.g., Budziszewski 1986; 1997; Budziszewski and Grużdź 2014). As a result, a modern monograph of the site was created, presenting the outcomes of studies in a comprehensive and multi-aspect manner. The research project and releasing of the publication in question were co-financed by the Ministry of Culture and National Heritage, National Institute of Cultural Heritage, and the Local Government of the Masovian Voivodeship.

The monograph starts with a short introduction by Wojciech Brzeziński and Witold Grużdź, where the scholars present the goal that lead them to create this work, and a brief summary of what is to be expected in the following chapters.

The chapter I, entitled "Krzemień ożarowski [Ożarów flint]" is divided into two sections written by Janusz Budziszewski, W. Grużdź and Miłosz Huber. In this part, the authors focus on the question of what the Ożarów flint actually is. They also draw the reader's attention to the issue of the ambiguous meaning of the term "flint". The problem is that most of archaeologists use this term for any sorts of siliceous

[a] Institute of Archaeology, Nicolaus Copernicus University in Toruń, 44/48 Szosa Bydgoska Street, 87–100 Toruń (Poland); e-mail: 291308@stud.umk.pl; ORCID: 0000-0003-3467-687X

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rocks, while researchers specialising in natural sciences distinguish cherts and hornstones, apart from flints. With regard to Ożarów flint, this issue is particularly important, since it is a much diversified raw material. Petrographic analyses revealed that most of the "Ożarów flints" should be called "Ożarów chert". However, in order to avoid unnecessary misunderstandings referring to the proper nomenclature, the authors suggest staying with the traditional name, but at all times keeping in mind that this is only a conventional term.

The following chapter II, entitled "Badania na stanowisku – lokalizacja, budowa geologiczna, zasięg stanowiska oraz stratygrafia obiektów [Research at the site – the location, geologic structure, the site extent and stratigraphy of features]", is divided into three sections written by Maciej T. Krajcarz, J. Budziszewski and Tomasz Herbich. This part is quite varied in terms of its content. The first section (II.1.) by M. T. Krajcarz describes the stratigraphy, geology and geological history of the site in the context of archival studies. These considerations are complemented with the most recent information obtained during a field survey conducted in 2019. An extremely interesting fragment of the chapter is dedicated to the analyses of fillings of shafts based on the drawn documentation from the excavations. Thanks to these studies it was possible to reconstruct the sequence of filling of extraction holes, and establish to which degree the features were backfilled intentionally. In the two following sections, the authors (J. Budziszewski and T. Herbich) present the history of archaeological research (field surveys and excavations) carried out at the site, and their outcomes. A significant fragment dedicated to electrical resistivity tomography analysis sheds a whole new light on the possibilities of application of this research technique. The first investigations in the respect, conducted in the 1980s and 1990s, delivered rather inaccurate results. They were subject to analysis once more in 2019, this time using the archival data combined with the most recent IT and analytical techniques. The results turned out to be much more than satisfactory and allowed establishing the extent of the mining field more accurately, on one hand. On the other, they displayed the possibilities of creating such new models using archival materials.

Chapter III, "Materiał krzemienny [Flint material]" is divided into 7 sections, the authors of which are W. Grużdź, Witold Migal and Katarzyna Pyżewicz. This chapter is the longest in the entire monograph, since it comprises nearly 100 pages. It contains detailed analyses of flint materials, such as cores, blanks, and refittings. Noteworthy is the approach of the authors to the issues discussed there. Instead of employing a classical analytical technique focused on the technology of core preparation and blank production, the scholars rather paid their attention to the reconstruction of the operational chain in order to associate particular artefacts with the flint processing stage they came from, and determine the type of waste products and blanks that were

expected to be the result of this processing stage. A significant element of this chapter is also the microscopic analysis of traces left on the artefact surfaces, which provided the grounds for confirmation of macroscopic observations with regard to the application of hard hammerstones for initial preparation of flint and organic tools (retouchers) for more advanced and precise working. Moreover, the scholars succeeded in confirming reliably the purpose for obtaining flint material in Ożarów, indicating that it was to be used for the production of flint sickles.

Chapter IV, "Materiały ze skał niekrzemionkowych [Non siliceous materials]" is relatively short, only 9 pages long. It is divided into two sections written by M. Huber, W. Migal and W. Grużdź. In the course of the studies there were distinguished almost 1,000 specimens of non siliceous rocks, which according to the analysis performed in the field, could have been used by humans, or they might have been a foreign element, not occurring at the site naturally. Ultimately, 93–94% of this collection turned out to be geofacts. The scholars analysed this collection using laboratory techniques to identify the exact raw material they represented. Thanks to this analysis, it was possible to determine that these materials were most likely transported to the site by the continental glacier from Scandinavia. The investigations revealed that most of these specimens were used as hammerstones for flint processing. There is still an unsolved issue of the sandstone slabs found, the function of which has not been discovered until present. They could have been unfinished hammerstones or polishing stones.

The following chapter V is entitled "Fragmenty naczyń ceramicznych z terenu pola górniczego w Ożarowie [Fragments of ceramic vessels from the mine field in Ożarów]". In this chapter its author, Piotr Włodarczak, describes the analysis of all, namely three, pottery fragments found in the mining field in Ożarów. This collection, though very small, turned out to be very useful. One of the fragments was assigned to the older phase of the Corded Ware Culture, which until now had not been associated with the utilisation of Ożarów flint. The other two were linked with the Mierzanowice Culture, for which the utilisation of this raw material had been already confirmed.

Chapter VI, consisting of three sections, is entitled "Analizy środowiskowe [Environmental analyses]". It was written by J. Budziszewski, Alicja Lasota-Moskalewska, Joanna Piątkowska-Małecka, Marcin Szymanek and Magdalena Moskal-del Hoyo. In this chapter one can find information on two artefacts made of deer antler, the function of which has not been established until present. They could have played a role of a lever, retoucher, punch or simply they might have been post consumption waste. This part of the monograph also contains a description of the malacological analysis. Shells of snails recorded at the site indicated a deforested environment covered with bushes. This finding may evidence a landscape typical

of mining fields, which confirms, once again, the effectiveness of applying this research method for reconstruction of archaeological sites. In addition, the chapter encloses a section on fragments of charcoal found. Due to the fact that only two fragments in poor condition were found, their contribution to our knowledge about the site must, however, be considered irrelevant.

Chapter VII, "Analiza geometryczno-morfologiczna sierpów z krzemienia ożarowskiego [Geometrical and morphological analysis of sickles made of Ożarów flint]" was written by Kamil Serwatka. The author presents a less popular method used for description of bifacial tools, namely employing the allometric index. This research method revealed that the main criterion that diversified the appearance of sickles is the degree of exploitation of their cutting edges. The analysis covered artefacts coming from five sites. In total, 31 specimens were examined, most of which (as many as 25 pieces) were found at the site Mierzanowice 1 (Bąbel 2013).

Chapter VIII, "Badania eksperymentalne związane z wytwarzaniem sierpów z krzemienia ożarowskiego [Experimental studies associated with production of sickles made of Ożarów flint]" by W. Migal was dedicated, as indicated by the title itself, to the analysis of experiments aimed at producing flint sickles and then, investigating the traces left on the surfaces of these tools and the waste products coming from their elaboration. This experiment was based on the assumption that only mineral hammerstones were used for flint processing, and it aimed at verifying whether it is possible to make a thin bifacial tool without using organic or metal tools, in contradiction to commonly accepted opinions. The experiment was successful and the scholar managed to produce knives/sickles of desired parameters only with the usage of mineral hammerstones (both, hard and soft ones). Moreover, the author confronts, among other things, the statistical amount and weight of flakes and waste products that was left after the flint processing with the results of excavation studies. He also notices that at the site in Ożarów only semi-products of sickles were made since no artefacts associated with the final stage of the sickle production were found there; therefore, their final preparation must have been performed elsewhere, in the nearby workshop or at a settlement. A significant outcome of the experiment was to obtain flakes bearing morphological traces linked with soft organic hammers, e.g. made of antler, while they were actually detached with the use of a mineral hammerstone.

The ninth chapter, "Datowania absolutne i ich prahistoryczny kontekst [Absolute datings and their prehistoric context]" written by J. Budziszewski, W. Grużdź and P. Włodarczak presents the radiocarbon dates obtained, and investigates them in terms of their location and the layers they were found in. These datings confirmed the conclusions drawn from the analysis of ceramic materials, evidencing that the mining field was used in three periods, namely by the communities of the Corded

Ware and the Mierzanowice Cultures. The authors also quote similar datings from the neighbouring mine sites, such as Polany site II, Polany Kolonie site II, Wierzbica "Zele", Radom distr., Borownia, Ostrowiec Świętokrzyski distr. (Schild 1995; Lech *et al*., 2019; Lech and Werra 2019). Furthermore, an attempt was made to correlate the datings from the mine in question with dates obtained from settlements. However, it turned out to be very difficult due to the poor degree of knowledge of settlements of the Mierzanowice Culture.

Chapter X, "Koncepcja czasu i przestrzeni w kulturze mierzanowickiej a Ożarów [The concept of time and space in the Mierzanowice Culture against the background of Ożarów]" by Stanisław Iwaniszewski is an interesting proposition of a wider perspective to investigate the issue of human settlement and a role of mining activity within it. The author made an attempt to reconstruct the microregion inhabited by the communities of the Mierzanowice Culture, employing, among other things, the possible visibility of crucial points in the ancient landscape, as well as the possibility to relocate of human groups in the Neolithic and the Bronze Age. S. Iwaniszewski suggests that the localisation of the mining field could have excluded, to some extent, prehistoric miners from everyday activity of the microregion, since only a small part of population living there could have seen this spot.

The final chapter (XI) is entitled "Wykorzystanie krzemienia ożarowskiego w świetle materiałów osadniczych [Utilisation of Ożarów flint in the light of settlement material]". The author of this part of the monograph is J. Budziszewski. The chapter starts with a short introduction outlining the issue of identification of the raw material from Ożarów. Then, the scholar analyses particular epochs and cultural units in respect of utilisation of Ożarów flints. He notices that until the times of the Corded Ware Culture, this raw material was used only occasionally, since in the closest surroundings of the site there were available Jurassic flints of better quality. A noteworthy part of this text is that discussing the manners of utilisation of Ożarów flint, where the author made an attempt to reconstruct its role in the activity of the community of the Mierzanowice Culture.

The monograph ends with a summary written by W. Grużdź. The scholar briefly summarises the most significant results of studies and analyses, based on which he creates a coherent picture of the prehistoric mine in Ożarów, however, he stresses the fact that there are still many gaps in our knowledge about this site. One of the unsolved issues is the identification of the oldest episode of the mining field exploitation.

The monograph is complemented with a CD containing a digital version of the book and a catalogue enclosing all of the artefacts obtained from the site. A great value of the monograph is the large fragments translated into English and English captions added for all illustrations.

In terms of content, my evaluation of the monograph is very high. As was mentioned at the beginning of this review, this work presents a very comprehensive and innovative approach to the studies upon the prehistoric mining. It is difficult to find methods for analysing artefacts coming from prehistoric mines available in Poland that were not employed in the investigations carried out in Ożarów. One cannot neglect how much attention was paid to the methodology of the studies conducted. Nevertheless, each of the methods is discussed very critically, outlining the drawbacks of its application. My only reservation refers to the specific wording used by the authors, which at some points may seem hermetic and difficult to understand. For instance, in the third chapter, an expression *zgrubne* (in English: *coarse, rough*) is used multiple times with reference to the working of tools or flakes. By intuition, the reader can guess the meaning of this term; however, the authors have defined neither the word itself, nor the source literature where such definition could be found.

In technical terms, the monograph was prepared very nicely, aesthetically and conveniently. A hard cover with a minimalist graphic design immediately gives the impression of a scientific elegance. The large and very readable illustrations and figures help a better perception of the issues discussed. Nevertheless, in this regard, apart from my general very positive reception, I can formulate a few small reservations of editorial nature. Firstly, the great majority of the illustrations are provided with thoroughly prepared and informative captions, containing the description of the specimen presented and its provenance, except for the section III.3, where the captions inform only about the provenance of artefacts, though in great detail. I can understand the concept of demonstration of artefacts coming from particular features, however, in my opinion, these captions lack information on the specific type of the artefact (flake, blade, waste product, etc.). I particularly enjoyed the manner of employing archival drawings, onto which readable boundaries were superimposed (e.g., fig. 3, section II.3), or supplementing them with modern, digital re-drawings placed right below the original, archival sketch (e.g., fig. 10, section II.1.). My next comment is of strictly subjective nature: if the authors decided to make such effort to present most of the drawn documentation in the above-mentioned manner, very legibly and aesthetically, it is incomprehensible, in my opinion, that in some sections the drawings lack any elaboration or they only contain markings of the features, which makes them significantly less readable (e.g., fig. 10, section II.3). It is a bit striking and disappointing that both of these manners of presentation can be found in one chapter, within the same section even. My last remark concerns chapter X. While reading it, I was very surprised not to find an illustrative map, which could help in understanding the perception of the region in question, with the spatial relationships between the sites. Instead, the author attached only a picture with the line

of the horizon. Adding a plan of the region under study would be very helpful in better understanding of this very interesting discussion.

In my opinion, this monograph is a very valuable contribution which I sincerely recommend to all archaeologists, not only those interested in the issues of prehistoric mining or the Mierzanowice Culture. Every scholar, especially those engaged in prehistoric studies, can take advantage of reading this publication, mainly thanks to the holistic approach to the issues discussed in it, which includes a very wide range of various analyses and critical viewpoints on the research methods employed. There is one other reason why this work has high value. It proves how comprehensive studies can be conducted if they engage modern and innovative techniques and technologies when almost only archival documentation is available. Last but not least, I would like to note the fact that the book under review aligns well with a certain trend developing presently in Polish archaeology. For a few years we can observe the revival of studies on prehistoric mining. There are new investigations carried out at many sites, including both those previously known, as well as recently discovered ones. Amongst those, one can name the studies in Borownia (Lech 2020), Orońsko site II, Szydłowiec distr. (Osipowicz *et al*., 2019), or Poręba Dzierżna site 24, Olkusz distr. (Sudoł-Procyk *et al*., 2021). At the same time, studies on archival materials are carried out, or examining sites using non-invasive methods, such as those in Bębło, Cracow distr. (Trela-Kieferling 2021). To summarise, the monograph under review is a very valuable contribution, and its authors deserve the highest appreciation for their tedious work on almost exclusively archival material.

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