

From Mine to User: Production and Procurement Systems of Siliceous Rocks in the European Neolithic and Bronze Age

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edited by
Françoise Bostyn, François Giligny
and Peter Topping

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Cover image: Map of siliceous raw material deposits on the Ryczów Upland (drawing by M. T. Krajcarz)

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UISPP PROCEEDINGS SERIES VOLUME 10 – From Mine to user: Production and Procurement Systems of Siliceous Rocks in the European Neolithic and Bronze Age

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Foreword to the XVIII UISPP Congress Proceedings

UISPP has a long history, originating in 1865 in the International Congress of Prehistoric Anthropology and Archaeology (CIAAP). This organisation ran until 1931 when UISPP was founded in Bern. In 1955, UISPP became a member of the International Council of Philosophy and Human Sciences, a non-governmental organisation within UNESCO.

UISPP has a structure of more than thirty scientific commissions which form a very representative network of worldwide specialists in prehistory and protohistory. The commissions cover all archaeological specialisms: historiography; archaeological methods and theory; material culture by period (Palaeolithic, Neolithic, Bronze Age, Iron Age) and by continents (Europe, Asia, Africa, Pacific, America); palaeoenvironment and palaeoclimatology; archaeology in specific environments (mountain, desert, steppe, tropical); archaeometry; art and culture; technology and economy; biological anthropology; funerary archaeology; archaeology and society.

The UISPP XVIII World Congress of 2018 was hosted in Paris by the University Paris 1 Panthéon-Sorbonne with the strong support of all French institutions related to archaeology. It featured 122 sessions, and over 1800 papers were delivered by scientists from almost 60 countries and from all continents.

The proceedings published in this series, but also in issues of specialised scientific journals, will remain as the most important legacy of the congress.

L'UISPP a une longue histoire, à partir de 1865, avec le Congrès International d'Anthropologie et d'Archéologie Préhistorique (C.I.A.A.P.), jusqu'en 1931, date de la Fondation à Berne de l'UISPP. En 1955, l'UISPP est devenu membre du Conseil International de philosophie et de Sciences humaines, associée à l'UNESCO. L'UISPP repose sur plus de trente commissions scientifiques qui représentent un réseau représentatif des spécialistes mondiaux de la préhistoire et de la protohistoire, couvrant toutes les spécialités de l'archéologie : historiographie, théorie et méthodes de l'archéologie ; Culture matérielle par période (Paléolithique, néolithique, âge du bronze, âge du fer) et par continents (Europe, Asie, Afrique, Pacifique, Amérique), paléoenvironnement et paléoclimatologie ; Archéologie dans des environnements spécifiques (montagne, désert, steppes, zone tropicale), archéométrie ; Art et culture ; Technologie et économie ; anthropologie biologique ; archéologie funéraire ; archéologie et sociétés.

Le XVIII^e Congrès mondial de l'UISPP en 2018, accueilli à Paris en France par l'université Paris 1 Panthéon-Sorbonne et avec le soutien de toutes les institutions françaises liées à l'archéologie, comportait 122 sessions, plus de 1800 communications de scientifiques venus de près de 60 pays et de tous les continents.

Les actes du congrès, édités par l'UISPP comme dans des numéros spéciaux de revues scientifiques spécialisées, constitueront un des résultats les plus importants du Congrès.

Marta Azarello
Secretary-General /
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From Mine to user: Production and Procurement Systems of Siliceous Rocks in the European Neolithic and Bronze Age

Introduction

The 18th UISPP congress held in Paris in June 2018 provided the opportunity to assemble the members of the commission for 'Flint Mining in Pre- and Protohistoric Europe' as well as other European researchers during two full day conference sessions. The first session 'Siliceous rocks: procurement and distribution systems' was aimed at analysing one of the central research issues related to mining, i.e. the production systems and the diffusion of mining products. The reconstruction of extraction methods, the identification of specific toolkits developed for this activity, and the social organisation behind mining are key factors in the interpretation of mining phenomena. The impact of extraction on the environment is important but it can also be interpreted in terms of territoriality, and possibly associated with group mobility across wide areas. In this case the estimation of the number of people involved in the exploitation phase is fundamental, although this remains invariably a difficult question to answer. The study of mining products is a second area of research, more particularly in regard to the identification of imported products within the mass of local products, as well as the identification of local products destined to be exported. A central element in this is the definition of selection criteria relating to potential export products. The other area for consideration proposed to the conference participants related to the social organisation underlying the different fields of activities. The use of mapping and statistical tools can help to identify the production places and the scale of exchange systems involving intermediaries at several levels (villages or central places). This makes it possible to reconstruct the distribution networks of different products and to propose models involving territorial management at local, regional or long-distance scales.

The second session 'Flint mines and chipping floors from prehistory to the beginning of the nineteenth century' focused on knapping activities carried out on the periphery of the extraction sites. Excavations have provided evidence for the presence of knapping workshops in the immediate vicinity of the mine shafts, or in the upper fills of the shafts themselves, where knappers had cleaned up their working spaces or post-abandonment erosion phenomena had levelled the ground surface and filled low-lying surface features. In addition, recent studies have shown the existence of knapping areas within villages, as well as in sites which are considered as being intermediary places between extraction sites and the settlements. The analyses of the knapping workshops make it possible to describe the processes lying behind thedebitage, to determine what the production aims were and as a result to identify groups of producers. The comparison of the various stages of the chaîne opératoire sequences, and the quality of the product make it possible to highlight different levels of skill and the artefact distributions can identify where more – or less – specialised actors participated in the distinct working spaces. This approach also contributes to an enhanced understanding of the social organisation of the communities being studied.

The contribution by Juan Luis Fernández-Marchena *et al.* presents the current knowledge concerning an often disregarded site, albeit one known as early as the 1930s, comprising an open-air workshop discovered in the Tarragona region. The data stemming from early surface collections and from recently resumed archaeological excavations, make it possible to describe the management and production systems for the local raw materials which were aimed at blade production. Abundant production waste was present as well as numerous hammerstones made from quartz and quartzite. 3D documentation of these workings was presented and considered

an asset because of its academic value. Radiocarbon dating carried out on ancient materials made it possible to date these remains to the Post-Cardial Early Neolithic. The nature of this site – a unique case in the region because of its location at an altitude of 1000 m – raises the question of seasonality and its relationship with the settlement sites within a territory. The authors stress the fact that it is important not to disregard older documentation, which may have been the case for researchers who have had more abundant context-based data at their disposal since the large rescue excavations which were carried out during the 1980s and later. Nonetheless, it would be worth restudying the data from certain sites which are still poorly documented by excavations, and this current project contributes to this trend.

The paper by Magdalena Sudoł-Procyk and Maciej T. Krajcarz develops the territorial approach to a microregion in the southern part of Poland during the Final Palaeolithic. The circulation of raw materials, mainly 'chocolate' flint, is an indicator for reconstructing the mobility of human groups during that period. Several extraction sites were identified, including traces of pits still visible on the surface and in others recorded in the stratigraphy of the Kleszczowa region. Lithic analysis makes it possible to identify blade production which includes core shaping with crests. South-east of Ryczów occasional cave occupations occur, which are thought to form part of a logistical system with the open-air sites in the region of the Barańskie Mountains. The circulation of raw materials in the form of prepared cores was also established. The importance of these sites within a wider procurement network still remains to be determined in detail.

Remaining in Poland, the contribution of Janusz Budziszewski *et al.* looks at the issue of the earliest exploitation of 'striped' flint, an issue which has been debated for about a hundred years through an extensive literature. This type of flint was characteristic of the large flint mine of Krzemionki. Thanks to Lidar imaging and surface collection, a dozen new exploitation zones have been identified over the last few years including four mines encompassing areas ranging from 2 to 4 ha. The authors describe here one of the smallest sites which was discovered in 1982, the 'Ostroga' mine in Ruda Kościelna, situated upon a slope with a configuration which differs from the traditional mines located on plateaus. The extraction of raw material on a hillslope has influenced the downslope movement of soils and waste which are probably in secondary contexts, creating a characteristic relief across the site. The artefacts collected on the surface are few but from a technical point of view they are homogenous, and include flake production and axeheads with a quadrangular cross-section. This distinctively Neolithic tool production shows similarities with the sequence at Krzemionki and can probably be attributed to the Funnel Beaker Culture, or possibly to the Globular Amphora Culture. This hypothesis will be tested by excavation at this site.

An overview of 'chocolate flint' exploitation is presented here by Dagmara H. Werra and Katarzyna Kerner-Gubała. This raw material, mentioned above for its use during the Final Palaeolithic, is one of the most renowned in Poland. It was used for a large number of products and was widely exploited by mining until the Bronze Age in the south-eastern part of Poland. It was exported as far as the Carpathian Basin. Five out of the twenty-six known sites are presented in more detail here: Orońsko, Tomaszów, Polany (site II), Polany Kolonie (site II) and Wierzbica 'Zele', which are located in two mining districts, Szydłowiec and Radom. The chronological development of extraction sites and their products is described, from the earliest mining dated to the Final Palaeolithic to those from the end of the Bronze Age. This development ranges from simple, relatively shallow shafts with or without a niche at the base during the Palaeolithic period, to narrow shafts up to 4.20 m deep with niches during the Middle and Final Neolithic, then to larger shafts up to 4 m deep during the Early and Middle Bronze Age and lastly very large shafts up to 7+ m deep during the Final Bronze Age. Blade production is evidenced for the Palaeolithic period. Blade production and rare axehead production is known during the Neolithic period, and raw materials of higher quality were chosen for blade production using unipolar or bipolar cores. During the Early Bronze Age bifacial debitage predominates. By the Late Bronze Age the blades and flakes are of a large size

and flint was still used in central-eastern Europe. In conclusion, the authors highlight the quality and the longevity of exploitation of this raw material, including changes to the type and scale of extraction sites and their products but few changes to the extraction tools.

Rossella Duches, Emanuela Gilli, and Marco Peresani analyse the data stemming from a high-altitude site in the Italian Pre-Alps in the Treviso region, Mount Doc, which dates from the Neolithic/Bronze Age transition. This site was excavated during two seasons in 2001 and 2003 and yielded abundant lithic waste and several hammerstones defining a knapping workshop dedicated to the shaping of blocks, tabular sheets or blades. The initial stages of the *chaîne opératoire* for foliate points was identified, and the preforms appear to have been subsequently taken to a different place for finishing. The same situation applies to blade production. In addition, distinctive failed pieces were re-used on site, probably for the production of arrowheads, dagger blades and foliate scrapers. A radiocarbon date indicating the first half of the 5th millennium should be considered with caution, because the assemblage is more typical of the end of the 4th millennium BCE. Further radiocarbon dates are needed to confirm this hypothesis. Lastly, this site can be associated with a network connecting the Belluno valley with the high plain of Treviso which is thought to play a role in the supply of lithic products to this region.

Harald Lethrosne, Olivia Dupart and Clément Recq present the recent excavation of a site in the Loir valley, the site of Lisle 'les Sablons' in the Loir basin. This site was discovered early in the 19th century by field surveys and was covered by thick colluvial deposits which had disturbed abundant knapping waste, alongside shallow pits filled with waste, probably related to flint extraction. The aim of this extraction was the production of flaked axeheads, which lack the grinding and polishing stages and reveal poor skills. A more accurate dating of the site is awaited. The axeheads resemble other regional examples such as those discovered at Pezou 'la Chenevière-Dieu', also located in the Loir valley. The results are in keeping with the general framework of the evolution of axe production in Northern France, and make it possible to better understand territorial organisation and the role of sites related to lithic production in social and economic terms.

Adrien Reggio and Nadia Ameziane-Federzoni report on the exploitation of rhyolite, a volcanic rock on Corsica. Discovered during fieldwalking, this high altitude site on the Alzu plateau appears to be a quarry. Excavations were carried out both in the quarry and in shelters or open air areas. Flake debitage was discovered, as well as the reduction of blocks or the shaping of flakes in nearby shelters. In addition, the presence of imported materials such as obsidian was noted. The issue of the export of the products and the extent of their distribution still need to be characterised. The presence of arrowheads in nearby settlements is associated with this quarry. The presumed dating corresponds to the Torrean culture during the 3rd millennium BCE, who specialised in the exploitation of materials at higher altitudes.

Véronique Brunet provides an overview of the mining region surrounding the Jablines mine in the Marne valley near Paris, a region that produced axeheads between the end of the 5th and the 3rd millennium BCE. The documentation relating to the Jablines mine, which was excavated on the occasion of development-led investigations carried out in the 1980s, has now been completed by the discovery of peripheral workshops or intermediate workshops between this mine and the settlements, which were also discovered during salvage excavations. This evidence makes it possible to model the question of territorial organisation and economic specialisation at these sites. The products are distributed over a long period of time spanning two millennia and make it possible to analyse the issue of knapping skills.

Jacek Lech reviews the use of 'striped' flint in central Poland from the vast mining complex of Borownia, known since the 1920s. This site, originally dated to the Bronze Age, was exploited by a zone of mining shafts spread across an area of nearly 12 ha which has generally been very well preserved within a forest. Before 2017 it was only subject to non-destructive surface investigations,

but following this date it was excavated with the aim of collecting evidence for absolute dating for the submission of a request for its inclusion on the list of UNESCO World Heritage Sites as part of the property '*Krzemionki Prehistoric Striped Flint Mining Region*'. During this project shafts were identified and dated to the end of the Neolithic/beginning of the Bronze Age. The production of axe blades has been attested as well as that of Zele-type knives, characteristic of the Early Bronze Age. Settlement sites related to the Globular Amphora Culture are probably associated with this extraction site as part of a zone of economic activity.

F. Bostyn, F. Giligny, P. Topping