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EXPERIMENTAL RESEARCH VERSUS THE POPULARISATION OF KNOWLEDGE OF THE STONE AGE

BADANIA EKSPERYMENTALNE A POPULARYZACJA WIEDZY O EPOCE KAMIENIA

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ABSTRACT. In this paper we shall demonstrate the relationship between experimental research regarding the oldest period of human history and the popularisation of knowledge of the Stone Age. Our discussion is based primarily on our own experience of undertaking experimental research and presentation of its results to participants of popular science events. Some examples illustrating the relationship between science and its popularisation have been provided.

Its potential notwithstanding, the popularisation of the Stone Age still seems undervalued as compared to educational initiatives related to subsequent periods. A number of factors should be held responsible for such a state of affairs, i.e. the realm of school education, wherein information on anthropogenesis is typically more frequently presented than other areas, such as the remains of material culture and its meaning, as well as the reform of education and the resultant syllabuses, which have reduced teaching prehistory to only key issues. Nonetheless, an increased interest in this period of history has been noticed in recent years. This is probably due to the availability of information, which is i.e. disseminated as popular science through media, the Internet in particular, as well as the development of the historical

re-enactment movement, as exemplified by the emergence of a few regional groups in Poland, who enact and portray life of people living in the Stone Age. Even though in most cases these activities are far from archaeological experiments, they frequently accentuate their scientific aspect, aimed at attracting viewers.

In the paper we attempt to determine the relationship between the popularisation of the oldest period of human history, including its educational asset, and experimental research[1]. We shall address these issues in the context of activities concerning the implementation of experimental research and presentation of its results and particular elements to the participants of popular science events we have hitherto undertaken. While the outcomes of our experimental tests are employed primarily for research purposes: the tested hypotheses are presented at conferences, in journals, bachelor and master's theses, at the same time we apply them for educational and popularisation purposes (for more see Pyżewicz et al. 2012). During various meetings with tourists, at picnics, festivals and lectures, we have given a credible account of the prehistory in a manner accessible to a wider audience. Bringing our professional, theoretical and practical background into play, we attempt to depict the Stone Age through personal commitment, by entering into a direct interaction with tourists.

EXPERIMENT AND ITS ROLE IN THE POLISH STUDIES ON THE STONE AGE

For years in their deliberations on the Palaeolithic and Mesolithic, archaeologists have referred experiments to as an invaluable source of potential information in research on the early periods of the Stone Age, characterised by the paucity of available archaeological sources[2], thereby aiding in providing answers to research questions on various aspects of the daily life of prehistoric communities.

The works of Stefan Krukowski[3], Ludwik Sawicki[4] and also Erazm Majewski[5], from the early twentieth century, are considered the first attempts at experimental research in the Polish studies on the Early and Middle Stone Age. The aforementioned researchers addressed the issue of flint working in the era when knowledge of gunflint production was still available in a more empirical form, which certainly facilitated a more comprehensive understanding of the ways of flint knapping and lithic tools production. Noteworthy is particularly the publication of Ludwik Sawicki

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[1] See, among others, Piotrowski 1999; Reynolds 1999a; 1999b; Stone, Planel 1999; Rasmussen, Grønnow 1999; Tichý 2005; Comis 2010.

[2] e.g. Bordes, Crabtree 1969; Pelegrin 1984a; 1984b; 1984c; Callahan, 1995; Tixier 1972; Sørensen 2006.

[3] Krukowski 1915.

[4] Sawicki 1922.

[5] Majewski 1902.

Przyczynek do znajomości technik obróbki krzemienia ('Some remarks on flint working techniques')[6], wherein the first written observations on experimental attempts at splitting nodules of raw flint were stated. In the post-war years, an interest in experimental research decreased along with the change of the methodological approach, in contrast to western Europe, particularly France[7], and Russia, where Sergei A. Semenov worked intensively, having pioneered traceological analysis in which usage of experimental tools is necessary[8]. Therefore, studies on flint working or other aspects of the prehistory differed considerably from those in Poland, wherein the impasse regarding the application of experiments began to resolve slowly in the 1980s. Developed mostly in relation to two trends: techniques of flint raw materials processing and the use of microscopic analysis to determine the function of tools, these studies were undertaken by i.e. Witold Migal, Jolanta Małecka-Kukawka, Małgorzata Winiarska-Kabacińska and, frequently with an entire panoply of both research questions and applied theoretical models, have been continued to the present day, both by the aforementioned researchers and others[9].

Experimental method[10] has also been a significant element of our investigations of archaeological sources, particularly when our intention is to elucidate issues related to the methods of working various types of rocks and organic materials (such as antler, wood), using them to produce tools, to the strategies of their usage in the Stone Age, the nature of particular activities that could have been undertaken by prehistoric groups, or to the appearance and functionality of the then housing structures. In addition, we may examine the formation of archaeological sites, including the causes for their current structure, as well as verify experimentally other methods used in the research on the past societies. At the same time, we realize that we are not able to reconstruct the complete image of hunter-gatherer communities of the Stone Age in this way. Our archaeological experiments may only provide some clues regarding possible solutions or scenarios that could have been undertaken also in prehistory. In other words, we test our hypotheses developed on the basis of archaeological sources, with the result that we may formulate statements concerning, among others, the possible course of particular situations in prehistory or ways of using particular objects.

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[6] Sawicki 1922.

[7] i.e. Bordes, Crabtree 1969; Tixier 1972; Pelegrin 1984a; 1984b; 1984c.

[8] Semenov 1957.

[9] i.e. Winiarska-Kabacińska 1988; 1990; 1992; 1993; 1996; 1998; 2007; 2008; Boguszewki, Migal 1989; Malinowski 1990; Borkowski, Migal 1996; Sałaciński, Migal 1996; Małecka-Kukawka 1999; 2001; 2005; Kamińska-Szymczak 2002; Migal 2005; 2006; Migal, Urbanowski 2006; Migal, Wąs 2006; Kufel 2008a; 2008b; 2010; Kufel-Diakowska 2011; Osipowicz 2009; 2010.

[10] cf. e.g. Malina 1983; Coles 1977; 1997, 308–309; Whittaker 1999, 282–283; Such, Szcześniak 2000, 78–79; Hurcombe 2004; Keleterborn 2005; Shimada 2005; Outram 2008; Comis 2010; Ferguson 2010; Petersson, Narmo 2011.

EXPERIMENT VS POPULARISATION

Recently, an opportunity has arisen to carry out a series of experimental tests relating to the Stone Age issues, the elements of which were used for educational and popularisation goals concerning the oldest period of prehistory. Our work has primarily focused on flint production and ways of using flint tools. Experimental research projects assume carrying out a series of laboratory, or, more frequently, field experiments, together with the so called actualistic tests[11], designed to simulate specific activities or situations that might have arisen in prehistory, assuming that the use of replicas of prehistoric objects leads to the formulation of general analogies in the process of interpreting archaeological data.

We addressed, for example, the issue of the mode of production of the Late Palaeolithic blades which were produced potentially either as blanks for tools or specimens 'ready' to use. From an economic point of view, the process of blade formation struck us as remarkable, given that most of the removed fragments of flint nodules were left unused at the production site, as evidenced by microscopic analysis (no use-wear traces, typically occurring when a tool comes into contact with the worked material, have been recorded). On finding that, we posed a following question: why such a large quantity of flint material, analogous forms of which were utilised by other communities, was not made use of? We also wanted to find out how particular blades were produced. With a view of answering these questions, we used experimental tests. As it turned out, making specific blades, typically used by particular Late Palaeolithic societies in their daily activities, was a formidable task. In order to remove a few desired blades in shapes preferred by prehistoric flint knappers, an elaborate flint nodule preparation process was needed (a significant number of specimens of different kind were thus produced). In addition, the comparison of the morphology and microscopic technological traces of blades removed by us and of the Late Palaeolithic ones, revealed that pebbles of sandstone were most likely used for knapping, which undermines the statements persisted in the Polish subject literature[12]. Since a person producing flint specimens needed to concentrate on the task, most of the elements of the above mentioned experiment were carried out in the absence of a large group of viewers. Only some tests were conducted during festivals, picnics or archaeological workshops, and different ways to produce core forms and blanks in the Stone Age were demonstrated at the same time. During this type of educational events we focused on the presentation of results of our research and demonstrated ways of flint working, using the same techniques we applied while doing our experimental work.

Another research project was related to game hunting strategies in the Mesolithic. Our objective was to verify the information on the morphology of flint elements of

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[11] cf. Shimada 2005; Outram 2008; Bamforth 2010; Comis 2010.

[12] more Grużdź *et al* 2012.

hunting weapons, methods of their setting in arrow shafts, as well as the alleged way of carrying arrowheads in containers (e.g. quivers). To this end, we have prepared an experimental base and enacted an experiment in the reserve at the Archaeological Museum in Biskupin, which was to simulate a hunting scene that could have taken place in the Mesolithic. The experimenter took a series of shots into the body of a freshly slaughtered animal using replicas of a Mesolithic bow and arrows (the test was later repeated). Owing to this simulation, it was possible to examine the capabilities and limitations of the carcass penetration by lithic arrowheads and to investigate deformations which formed at their tips. We believe that such experiments reflect prehistoric reality better than the use of ballistic gelatine. During the experiment part of the arrows did not reach their target and hit other objects, such as trees and the ground, which allowed us to attempt to analyse the specifics of deformation of those arrowheads which missed their target. In the next stage of the investigation we compared the results of the experiment, first of all traces resulting from setting arrowheads in a shaft, their specific location in the shaft and those originating when arrowheads hit various targets, to the surface of the Mesolithic insets from the area of the Polish Lowlands. A number of analogies were observed between the experimental forms and artefacts, thus providing an insight into the Mesolithic hunting. Our research aimed also at the identification of microscopic traces resulting from carrying experimental insets in leather or bone containers. Due to consecutive comparisons to prehistoric arrowheads we learned that even in the Mesolithic hunting weapons were carried in various types of leather containers[13]. Our intention was to comprehensibly present the results of our experiments to the general public professionally unrelated to the issues of the Stone Age. It is noteworthy that due to the occurrence of radical scenes, namely shooting a freshly killed animal, and the need of the archer to focus, we chose to exclude tourists as spectators during tests. Therefore, the experiments took place in the reserve in the early hours of the morning, when the public was not yet present. Instead, the results were featured in the form of multimedia presentations during festivals, archaeological workshops and archery tournaments. To this end, we used descriptive documentation, drawings and photographs compiled during experiments, and also presented the replicas of arrows and a bow used in the experiments. In addition, tourists were given an opportunity to learn the basics of microscopic analysis. Those who were particularly interested could have conducted ‘a microscopic analysis’ of the flint insets used during the experiment and study the detectable use-wear, at which both adults and children evinced considerable interest.

Studies on the influence of postdepositional factors on the comportment of flint artefacts the surfaces of which are typically heavily modified provide another example of a research project that, to some extent, combines experimental research, edu-

[13] for more details see Dmochowski, Pyżewicz 2012; Pyżewicz 2012; Pyżewicz, Grużdź [in press].

cation and popularisation[14]. In order to examine the effects of one of the factors, namely treading by people and animals, which probably significantly affected the formation of these deformities in prehistory[15], we engaged tourists visiting the reserve and the Archaeological Museum in Biskupin. The experiment consisted in placing replicas of flint implements in boxes between layers of sediment analogous to sediment deposited in selected areas of the Stone Age settlement. Such prepared containers were thereafter exposed on the educational trail for the visitors to tread on.

Beside the boxes we positioned posters which provided basic information on the experiment. 100 000 visitors are roughly estimated to have taken a direct part in the experimental tests. As a consequence, not only were the tourists acquainted with the basic principles of conducting experiments, but we also acquired data which provided the basis for further research, consisting in the comparison of macroscopic and microscopic traces, resulting from treading on the experimental specimens to the deformations registered at flint implements recorded at selected archaeological sites. The results have enabled a more precise interpretation of the origins of traces and helped answer the question whether these changes on surface were use-wear or formed as a result of artefacts having been trodden on over thousands of years.

One more example that illustrates links between popularisation and experimental research is connected to our study on the important factors affecting the way flint concentrations are formed and structured[16]. The former is related to the depositional stage, namely human behaviour associated with various models of practice chosen by prehistoric people while working flint in a given period of time. The latter is related to postdepositional factors, natural and anthropogenic, which can heavily alter the primary layout of a flint concentration. These studies were carried out in the archaeological reserve at the Archaeological Museum in Biskupin. Experimental tests, designed with a view to recognising and achieving a better understanding of the process of deposition of flint specimens during flint processing, while applying selected techniques and during the production of particular types of tools, were undertaken by a number of experimenters with different levels of practical knowledge. Several clusters were produced as a result – series of cores, debitage, as well as flint tools, formed in a specific time and on various surfaces, which sometimes overlapped in space (Fig. 1). The final deposition of specimens depended on various factors, including the predisposition and the position of the flint knapper, the method of flint working, the use of additional instruments such as aprons or cleaning up some implements and transferring them to another location within a camp. The location of all flint products, their spatial dispersion, was documented in detail. At this

[14] i.e. Lévi-Hall, 1993; 1996, Howard 1999.

[15] e.g. Shea, Klenck, 1993; McBrearty *et al*. 1998; Blasco *et al*. 2008.

[16] e.g. Boeda, Pelegrin 1985; McBrearty 1998; Burroni 2002; Pargeter *et al*. 2011.

Fig. 1. Experiment conducted at the archaeological open-air museum in Biskupin. The first phase of experiment was dedicated to flint blade production and later their deposition in shallow niche. When this stage was completed all materials were documented on plans (photo by K. Pyżewicz)

Ryc. 1. Prezentacja eksperymentu na terenie Muzeum Archeologicznego w Biskupinie. Pierwszy etap doświadczenia polegał na wytworzeniu wiórów krzemiennych i umieszczeniu ich w płytkim depozycie. Następnie zadokumentowano powstały w ten sposób obiekt wraz z krzemienicą, która pozostała na powierzchni (fot. K. Pyżewicz)

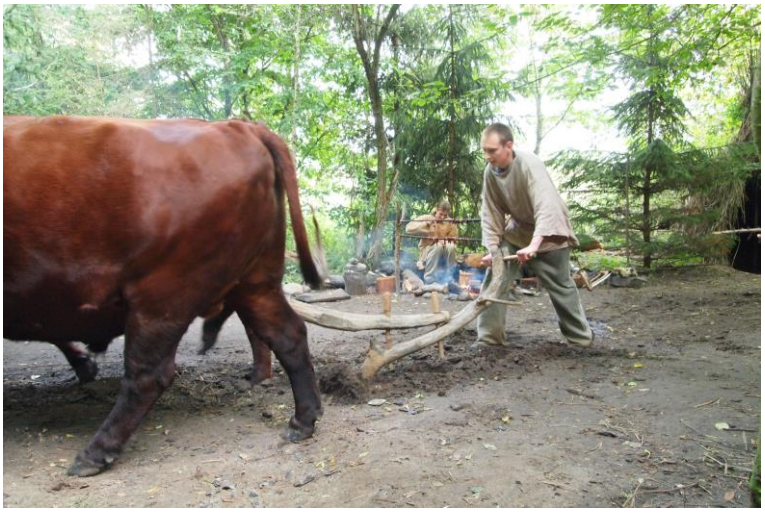

Fig. 2. The second stage of experiment was carried out to simulate post-depositional perturbations caused by the plow (photo by K. Pyżewicz)

Ryc. 2. Drugi etap doświadczenia polegający na symulacji czynników *podepozycyjnych*, które mogły wpłynąć na układ przestrzenny zabytków (fot. K. Pyżewicz)

stage of research, the tourists were only viewers, and in order to avoid the distraction of experimenters, we appointed one person to inform the tourists about the course of the experiment and to answer questions from the public. The second phase of the experimental studies was related to the activity of postdepositional factors. Here we focused primarily on examining one of the elements that affects the formation of the final layout of a flint concentration – treading by people and animals (Fig. 2). With this aim in mind, we set an educational trail through the selected, hitherto formed clusters, remains of the flint knappers' activity. For further research we engaged tens of thousands of tourists visiting the reserve and the Archaeological Museum in Biskupin. As a result, we obtained data that we may use for the next stage of the project (Fig. 3), where the idea is to 'reconstruct' not just one path, but 'a camp', with separate areas related to various types of human activity.

Fig. 3. Documentation of the experiment's results (photo by K. Pyżewicz)
Ryc. 3. Dokumentacja wyników przeprowadzonego doświadczenia (for. K. Pyżewicz)

CONCLUSION

We have provided barely a few examples of our experimental work in this paper. As mentioned before, experiments in different forms (the so-called laboratory tests or actualistic studies) provide invaluable assistance in solving many research problems, and their results referred to archaeological sources considerably extend

our knowledge of the past. At the same time, experiments can serve as an accessible educational tool addressed to the audience, often more interested in the empirical side of science. Noteworthy is the fact that the experimental method is very often identified with the popularisation activity. This conviction is particularly noticeable among visitors of a large number of organised festivals, picnics or archaeological workshops. Nevertheless, even if knowledge acquired as a result of hitherto completed archaeological experiments may be certainly used to some extent during demonstrations for a wide range of visitors, confusing education and popularisation with a research method is a mistake, committed also by archaeologists themselves. This stems probably from the fact that scientific research is 'mixed' with education and entertainment, which may be unrelated to making conclusions on the basis of archaeological sources. These types of events, often staged by enthusiasts, are almost impossible to exclude from archaeology, which is, inter alia, related to the fact that individuals involved in them typically adopt a façade of specialists or scientists and proclaim the 'revealed truth' while interacting with artefacts. A long tradition of experimental research notwithstanding, it seems that a dialogue between enthusiasts 'reconstructing' prehistory and academia still needs to be established. This would help 'remove' the tag of 'fooling around' from activities aimed at the dissemination of archaeology, which is earned by people, often acting in good faith, albeit not given any guidance from archaeologists.

To conclude, we believe that experimental research should be regarded as a universal tool to assist in considerations concerning a number of aspects of the history of the Stone Age communities, as well as the workshop of an archaeologist. This method needs to be recognised as entirely scientific and its research potential acknowledged, instead of being associated directly with activities aiming at dissemination of archaeology and prehistory, highly fashionable nowadays in Poland.

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BADANIA EKSPERYMENTALNE A POPULARYZACJA WIEDZY O EPOCE KAMIENIA

S t r e s z c z e n i e

Celem niniejszego artykułu jest próba określenia relacji między popularyzacją najstarszego odcinka dziejów człowieka oraz jej waloru edukacyjnego a badaniami eksperymentalnymi. Problematykę tę ukazano w kontekście dotychczasowych działań związanych z realizacją doświadczeń, prezentacją ich wyników oraz poszczególnych elementów uczestnikom imprez popularnonaukowych.

Efekty podjętych prób eksperymentalnych wykorzystywane są przede wszystkim w celach naukowych. Podczas prac nad źródłami archeologicznymi odwołano się do metody doświadczalnej. Pomaga ona wyjaśnić kwestie związane ze sposobami obróbki różnego rodzaju skał i materiałów organicznych oraz wykonywaniem z nich narzędzi, a także – ze strategiami ich wykorzystania w epoce kamienia, charakterem poszczególnych czynności, które mogły realizować ugrupowania pradziejowe, czy też z wyglądem i funkcjonalnością ówczesnych obiektów mieszkalnych. Dodatkowo można odnieść się do formowania się stanowisk archeologicznych, w tym powodów ich obecnej struktury, a także podjąć się weryfikacji eksperymentalnej innych metod wykorzystywanych w badaniach najstarszych dziejów człowieka. Jednocześnie trzeba pamiętać, że w ten sposób nie można odtworzyć w pełni obrazu społeczności łowiecko-zbierackich epoki kamienia. Przeprowadzane eksperymenty archeologiczne mogą jedynie dać wskazówki, że pewne rozwiązania czy scenariusze mogły być zrealizowane również w pradziejach. Innymi słowy, testowano hipotezy powstałe na bazie źródeł archeologicznych, dzięki czemu można było formułować twierdzenia

odnoszące się m.in. do prawdopodobnego przebiegu poszczególnych sytuacji w pradziejach lub sposobów wykorzystania konkretnych przedmiotów.

Jednocześnie rezultaty tych działań wykorzystano w edukacji i popularyzacji. Podczas różnego typu spotkań z turystami, w trakcie pikników, festynów czy wykładów przybliżono najstarsze dzieje człowieka w sposób przystępny i rzetelny większemu gronu osób. Spróbowano również – poprzez wchodzenie w bezpośrednią interakcję z turystami, osobiste zaangażowanie i odpowiednie przygotowanie teoretyczne oraz praktyczne – przybliżyć obraz epoki kamienia. W niektórych przypadkach możliwe jest również bezpośrednie włączenie większej grupy turystów w realizację badań, przez co łatwiejsze staje się wyjaśnienie specyfiki eksperymentów tym osobom.

W artykule wyraźnie zaznaczono, że metody eksperymentalnej nie należy utożsamiać z działalnością popularyzatorską, a takie przeświadczenie jest zauważalne szczególnie wśród osób zwiedzających organizowane festyny, pikniki czy też warsztaty archeologiczne. Oczywiście można w pewien sposób wykorzystać wiedzę płynącą z wcześniej zrealizowanych doświadczeń archeologicznych w trakcie pokazów przed dużym gronem odbiorców, jednak mylenie edukacji i popularyzacji z metodą badawczą jest błędem, popełnianym także przez samych archeologów. Wynika to zapewne z „przemieszania" się nurtu badań naukowych z edukacją i rozrywką, która może nie mieć nic wspólnego z wnioskowaniem na podstawie źródeł archeologicznych. Tego typu wydarzenia, często inscenizowane przez pasjonatów, są wręcz niemożliwe do wyłączenia z archeologii, co związane jest m.in. z tym, że osoby biorące w nich udział często przyjmują postawę specjalistów czy też naukowców głoszących „prawdy objawione" podczas obcowania z artefaktami. Wydaje się, że mimo długiej tradycji badań doświadczalnych wciąż potrzebne jest wypracowanie dialogu między osobami inscenizującymi a środowiskiem naukowym.

W opinii autorów badania eksperymentalne można potraktować jako uniwersalne narzędzie pomocne w rozważaniach nad wieloma aspektami dziejów społeczności epoki kamienia, jak i samego warsztatu archeologa. Należy otworzyć się na możliwości poznawcze tej metody i uznać ją za w pełni naukową, a nie łączyć jej bezpośrednio z bardzo modną obecnie w Polsce działalnością popularyzatorską archeologii i pradziejów.