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Contents

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ARTICLES

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Tool Dichotomies in a Period of Inter-epochal Transition – Philosophical and Anthropological Reflections on Post-Neolithic Dual Technology

Abstract

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The presented publication is the end result of an authorial, post-doctoral research project devoted to the multi-aspect flint tool dichotomy at the turn of the Stone and Metal Ages. The results of use-wear analysis of archaeological materials from south-eastern Poland and the Moravia region of the Czech Republic, obtained by the author over the last decade, have been supplemented in this article with a philosophical component. By visualising the network of connections on the empirical-theory line, the explanatory value of the dichotomous lithic concept was raised. Moreover, the discourse on the period at the turn of the Stone and Metal Ages has been enriched with new interpretative solutions for economic and social issues of that time in prehistory. The author places his philosophical investigations within the hermeneutical approach. After the study of key terms (dichotomy, divergence, convergence), structuralist thought becomes the leading theme at the end of the article. The paper deals with the concepts of such thinkers as: Martin Heidegger, Hannah Arendt, and Claude Lévi-Strauss.

Keywords: terminal lithic industries, tool dichotomy, early bronze age, archaeological theory, philosophy of science, hermeneutics, structuralism

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Introduction

This work on the philosophy of archaeology has a purely theoretical dimension – the aim is to provide a conceptual humanistic superstructure to the results of the author's empirical research (traseological analyses) undertaken in the last decade. The analysed archaeological materials, as well as the literature database, will serve as the source basis for the presented considerations. Some of the chosen research problems, already demonstrated by the author as preliminary concepts in academic literature (Wolski 2014; 2019a), have the opportunity to be significantly expanded and supplemented in the pages of this publication.

The Early Bronze Age in Europe (~2400–1600 cal. BC) was associated with the development and distribution of metallurgical technology. This phenomenon changed the order of functioning of the world in which for hundreds of thousands of years the basic inorganic raw material for the production of tools was stone. However, in fact, this is a simplified picture of this phenomenon, as copper metallurgy had its origins in the 8th millennium BC in the Middle East, which further resulted in its gradual spread in the Eurasian zone (Kadrow 2017, 64–69). This qualitative transformation did not take place simultaneously in all areas of the European continent, initially leaving some areas – for example those north of the Carpathian mountain chain and east

of the Vistula River – on the periphery of protoclivization centres for processing bronze and other metals (i.a. Kadrow 2001). Regardless of the socio-economic conversions and technological challenges of the era, lithic materials – as still having an undeniable economic potential at that time – successfully functioned on the old continent in the everyday life of prehistoric man for many more centuries (i.a. Libera 2001; Högberg 2009).

The author, referring to his functional analyses of lithic artefacts from southern Poland and Moravia (research methods: cf. Semenov 1964; Keeley 1980; Vaughan 1985; Pawlik 1995; Korobkowa 1999; Ollé *et al.* 2017), comparatively in relation to research results from countries in northern and western Europe, deals in this work with the issues of inventories of the turn of the Neolithic and Bronze Ages from a perspective that has so far been extremely rare. The phenomenon of the multi-aspect formal-utilitarian dichotomy of artefacts, which is the quintessence of the discussed considerations, was noticed by the author, carefully described and critically interpreted in his PhD thesis on the traseology of flint materials from Lesser Poland (Wolski 2016; 2020: monograph on the basis of dissertations), as well as in other publications (Wolski 2019a, 207–212; 2019b). As a result, two lines of dichotomy were listed with the general participation of the undertaken microware analyses (Tab. 1): (a) specialised line – represented by core forms that had special functions in the type of macrolithic sickles and daggers, and (b) opportunistic – manifested in flake forms used for everyday tasks, simple works. The above-mentioned perspective of the dual system of tools prompts for further research going beyond the scope of traditional archaeology.

The idea for this work has matured in the mind of its author over the last few years, along with the practical and theoretical confrontation with the unique nature of post-Neolithic flint materials, in connection with the concepts on this subject known from the academic literature, such as: (a) "tool-technological revolution" (Schild *et al.* 1977, 96; Lech 1983, 53), (b) "conventional and functional tools" (Kopacz and Valde-Nowak 1987, 75, 78–79), (c) chronology and taxonomy of macrolithic bifacial forms (Libera 2001), (d) the concept of "terminal lithic industries" (Kopacz 1987; 2012), (e) technological duality of late Dutch and Scandinavian flint materials (van Gijn 2010a, 153–154, 189–195; 2010b, 46–57; Högberg 2009, 219–240; 2010; Masojć 2014; 2016), (f) tools requiring "minimum and high technological investment" (Fouere 1994, 457–460, 506–507; Furestier 2005, 86, 102–104; 2007; 2008, 294–295; Bailly 2008, 284–287).

Adopting the concept of a multi-aspect dichotomy, understood as a supra-regional emblem of the breakthrough times, gives space for an in-depth, multidimensional reflections of the following types: (a) the opportunity to confront the problem of the functioning in social practice of tools representing both trends

Table 1. Dichotomy of lithic artefacts from the turn of Stone and Bronze Ages in Central and Eastern Europe (Wolski 2019a, 210, tab. X-1).

OPPORTUNISTIC LINE (Fig. 1)	**SPECIALISED LINE (Fig. 2)**
Local raw material, often of low quality	Imported high quality raw material
Small formally simple products on flakes without evident typological characteristics	Macrolithic products of very high complexity, classified as sickles and daggers
Hard percussion, retouch not necessarily required	Soft percussion, pressure technique, bifacial surface retouch
Negligible amount of microwear traces – one-time-use tools of multifunctional character	Well-developed diverse microwear traces – multifunctional tools
Short expedient use (various functions, lack of shape-function correlation)	Prolonged use – reparations, "long life" (specific recurring functions, perhaps seasonal?)
Egalitarian (commonly available) technology (brief learning, "anybody's" knowledge on the settlement)	Elite technology (long learning, trans-generation transfer of knowledge and skill)
Discovery context: settlement	Discovery context: burials, single/loose, presumably funerary finds, depots

of the dichotomy can be seen in the light of dualistic philosophical doctrines (from Platonic premodernity to postmodern critical theories) and in their direct or indirect relation to the prehistoric reality; (b) the vision of the dichotomy as a transregional (and possibly inter-technological) phenomenon seems to be in line with the "spirit" of this groundbreaking time (phil. *Zeitgeist*: cf. Krause 2019). The analysis of this phenomenon – with the use of the abstract concepts of "convergence" and "divergence" in relation to human activities – is intended to verify the developmental tendencies of post-Neolithic communities in the context of technological and economic behaviours (Mugaj 2017; Wolski 2019a, 212).

This paper consists of three parts preceded by an introduction and crowned with a polemical ending that does not end the discussion. Firstly, the author presents the characteristics and interpretation of archaeological materials which were the subject of his earlier research, but this time in a synthetic manner. These studies provide the basis for constructing a theoretical position in relation to the prehistoric issues of interest here. The second part shows what kind of alliance is possible between archaeology and philosophy and what purposes it would serve. The author of this work places his philosophical investigations within the hermeneutical approach, and thanks to the study of key terms (dichotomy, divergence, convergence), he moves to the interpretative third part, in which structuralist thought becomes the guiding principle. Martin Heidegger, Hannah Arendt, Claude Lévi-Strauss – these are just some of the great thinkers thanks to whom the tool dichotomy phenomenon associated with the Stone and Metal Ages can be properly presented.

1. Dual artefacts from the perspective of traceological (functional) analyses

1.1. Early Bronze Age flint materials from Lesser Poland

Creating a traseological perspective in the study of post-Neolithic flint inventories was the challenge of the author's successfully completed doctoral project (Wolski 2016; 2020). The study of flint material from the settlement site of Targowisko 16, Wieliczka district, which was conducted at that time (Włodarczak (ed.) 2012), supplemented the current knowledge of the tools of the Early Bronze Age of Lesser Poland, mainly from the upland area (Kopacz 1976; 2012; Balcer 1977; Kopacz and Valde-Nowak 1987; Kadrow 1995; Kadrow and Machnik 1997; Libera 2001; Bąbel 2013a; 2013b; Wolski 2013), sometimes throwing new insights into the problems of the daily use of tools. In light of the available data, using information from the author's microscopic observations and additionally applying analogies concerning functional analyses of "late" materials from other areas of Europe, the study of Early Bronze Age lithics from Lesser Poland appears to be a very important, even indispensable branch of the past economy. The ad hoc day-to-day production of the settlers from Targowisko, based on the idea of quickly obtaining a small flake with a sharp edge, from rock in the immediate vicinity and mostly of low quality, using a hard hammer, seemed to be permeated by the spirit of pragmatism. The microdeformations discovered on the used tools from the aforementioned settlement are for the most part barely interpretable or even impossible to interpret, as confirmed by the performance of occasional activities of a non-cyclic nature within the households – with formally uncomplicated, commonly available, simple, and thus universal tools, with features that make precise typological qualification difficult, where retouching seems to have been a non-essential/secondary element (Fig. 1).

On the other hand, the constant nature of the activity should be associated with the use of formally legible pieces, discovered loosely outside the settlements and in sepulchral contexts, macrolithic bifacial forms, especially in the type of sickles (but also daggers) – elaborately prepared with flat retouching using pressing techniques, always with the use of high-quality imported raw material (Fig. 2). Such tools were used for a longer period of time, cyclically, most likely seasonally; they were characterized by multifunctionality, a natural formal predestination to be used in the course of earthworks and in the processing of cereals; they were often subjected to modifications and, as a result, to dimension reductions. For microscopic studies of the described types of artefacts, important funerary sites were taken into consideration, including: the cemeteries of the Strzyżowska culture in Raciborowice Kolonia 1 and 2, Chełm district (Ślusarski and Ślusarska-Polańska 1988) and the necropolis of the Mierzanowicka culture in Orliska Sokolnickie 1, Tarnobrzeg district (Czopek *et al.* 1993).

The polarization of the artefacts' characteristics is recognisable via the raw material, technological and utilitarian aspects employed, but also on a dimension beyond the practical. Mutual oppositions between the two described lithic lines can be multiplied, hence the term "dichotomy" as an illustration of the entire phenomena of the tool world of the discussed period of time in prehistory.

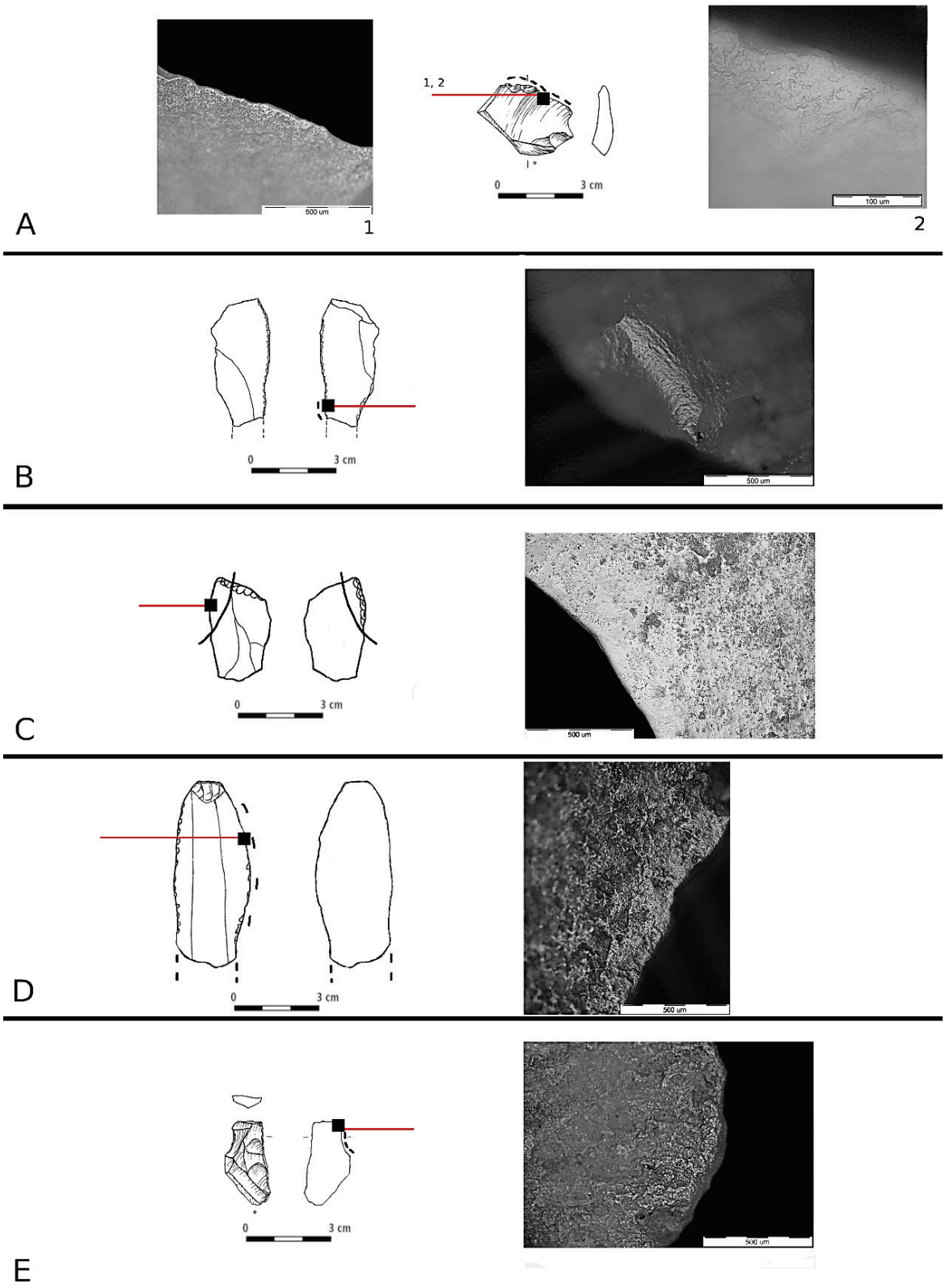

Fig. 1. Example of tools belonging to the opportunistic line – Targowisko 16, Wieliczka district. Microtraces on flint artefacts (A, E – after Włodarczak 2012b, fig. 33, 34; B–D – photos and graphics by D. Wolski; Wolski 2020, 68, fig. 13).

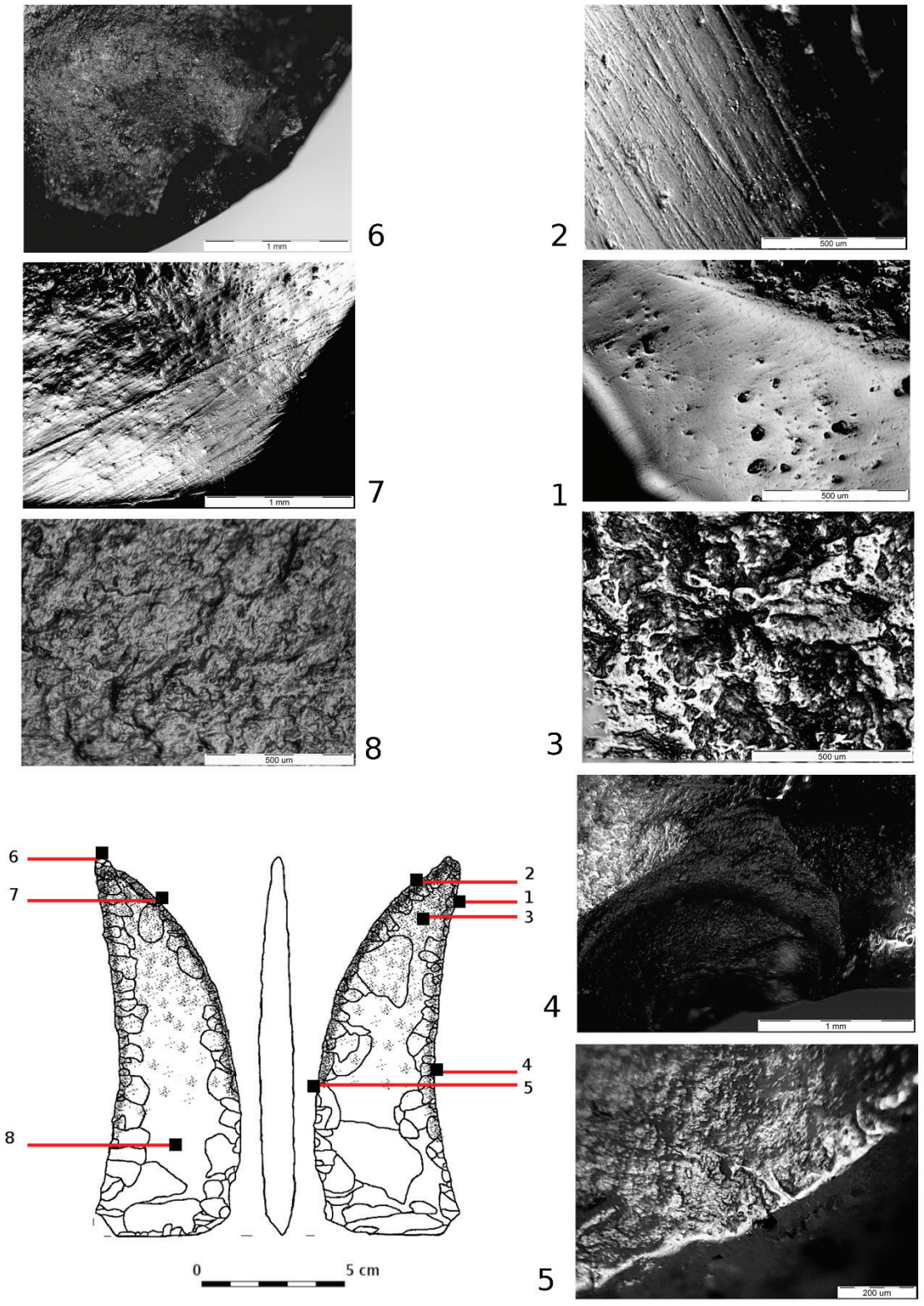

Fig. 2. Example of tool belonging to the specialised line. Microtraces on flint artefact (after Ślusarski and Ślusarska-Polańska 1988, fig. 14: 1; photos and graphics by D. Wolski; Wolski 2020, 103, fig. 24).

It is possible that only a cyclical/seasonal type of economic activity could have ensured the harmonious functioning of Early Bronze Age communities, which became achievable with flint tools – including specialised and technologically advanced ones, the creation of which lay beyond the capabilities of the average inhabitants of the settlements at the time (cf. Wolski 2014). Repeated annual activities, performed only at certain times of the year, noticeably correlate with a specialised line of dual lithic technology, rather than ad hoc settlement production.

1.2. Late Neolithic chipped stone materials from Moravia

The next step with the use of traseology in the study of "terminal lithic industries" was the microscopic analysis carried out for materials from the Stránská Skála hill settlement site in the Brno-Slatina district – the late phase of the development of the Bell Beaker culture in Moravia (Wolski 2019b).

In accordance with the nature of the turn of the Neolithic and Bronze Ages, both the processing of raw material and its utilitarian use by the people settled on the Stránska Skála slope were subject to the rule of optimization in terms of resources management. For example: (a) almost exclusively local rocks of poor quality from the immediate vicinity were used; (b) during reduction, polyhedral, angular cores were favoured, for which mostly hard hammer was used; notable is the microscopically confirmed complete lack of platform edge trimming to create the high degree of knapping control; (c) the splintered technique was willingly used – as it seems, with the intention of both coring (just in case?) and obtaining tools (Wolski 2019b, 146–147).

The performance of microscopic analysis of the artefacts from the excavated pit led to several conclusions, including the following: (a) only a negligible number of flint pieces were in use: singular micro-traces of distinctive wear; use-wear more often in the initial or intermediate developmental stage; (b) few actual working tools were found, indicating the short-lived functioning of the structure (as part of the household environment).

Adopting a dualistic perspective of flint phenomena, the Late Neolithic inventory obtained from Stránska Skála undoubtedly represents only one part of the dichotomy described above. We are dealing with a typically ad hoc technology, in which the specialised line is not represented at all. Analysing the acquired material, it is possible to recognise only a certain focus in the operational chain – in fact, not on macrolithic bifacial tools, but on smaller forms, possibly elements of complex composite implements.

The self-sufficiency achieved in raw material and tool economics by populations functioning at the dawn of a new era should certainly not be viewed in terms of downfall or marginalisation (even despite the potential loss of household flint working status as a cultural medium), but as the result of highly advanced economic and social optimisation. Technological and functional simplification had its practical benefits, but also certain dynamics. The epochal changes that followed in Moravia are clearly reflected in the assemblage of artefacts recovered from the Stránska Skála excavation, which undoubtedly represents the opportunistic line of the dichotomy (cf. Wolski 2019a, 212).

2. Philosophy and archaeology – an inter-academic relationship

Enlightenment and post-Enlightenment philosophy, and with them the growth of scientific knowledge since the 18th century, brought many ideas that resulted in the emergence of new academic disciplines, fully formed in the methodological sense, including archaeology. Interest in prehistory, of the amateur-collector type not yet characterised by a deeper thinking on the essence of the artefact in relation to man as a subject of cognition, dates back to antiquity and the antiquarian activity of the last king of the New Babylonian Empire, Nabonid (reign: 556–539 BC). Professional cultural-historical reflection, based on an elaborate apparatus of excavation, cabinet and laboratory methods, aimed at placing contemporaneous artefacts from homogeneous contexts on the axis of prehistory, only takes its beginnings in the 19th century (Renfrew and Bahn 2002, 25). It took several more decades for, around the middle of the 20th century, prehistorians to reach a critical point in affirming their own branch of knowledge, when it became apparent that the traditional vision of the history of material culture in many approaches was shown to be naïve, intuitive and chaotic, and – consequently – far from sufficient for the developmental needs of the field, looking from the 1960s onwards (Clarke 1973; Krieger 2006, 31–46; Johnson 2013, 42–50). It was at this stage (the so-called New Archaeology or, in other words, processual archaeology) that a mass of new theoretical concepts were incorporated into archaeological discourse, as well as a kind of reflection on the principles of the discipline and the criteria for the truthfulness of inferences about the past. Thus, in the history of archaeological thought, with all its complexity, it is

possible to distinguish at least two stages – pre-theoretical (ca. until the 1960s) and theoretical (continuing until today); however, this is not a unified picture. The introduced division established in the discussion of the philosophy of archaeology, which assumes the theoreticalisation of the discipline and reflection on the course and mechanisms of cognition by prehistorians of the history of man and his culture, an opposition: theory – empiricism (Rączkowski 2009, 7).

Such a view of the matter results in another dualism expressed, on the one hand, in the desire to make the discipline in question fully academic in the scientistic and technician sense (making and verifying hypotheses, problematisation of issues instead of creating a prehistoric historiography, a priori versus a posteriori reasoning, intersubjective testability of the research result, falsifiability). Inspiration from the philosophy of science, often including the formal sciences and therefore deductive-type thinking, is well evident in this trend (cf. Salmon 1982; 1992; Wylie 1985). Still remaining with the discussed term of theory, parallel to the above pro-science trend, which for various reasons is mainstream in research activity especially in Anglo-Saxon studies (academics from continental Europe opt rather for an inductive model of explanation), there is a process of theorising archaeology using the humanities, often together with their methodological apparatus, such as: broadly perceived anthropology, psychology, sociology, linguistics, or philosophy of culture. Based on the illustration provided it can be assessed that, thanks to a kind of "intrusion" into the conglomerate of disciplines from which archaeology constantly tries to take inspiration, the academic distinctiveness of this branch of knowledge – seeking invention according to research needs in pre-modern, modernist, and post-modern conceptual models – is being consolidated.

On the other hand, the aforementioned empirical area includes archaeological activities that do not aspire to scientific or academic status. The practical category is associated with all field research carried out by professionals authorised to do so (often acting as experts on a purely commercial basis, as part of their own business activities), as well as it refers to preliminary cabinet work on the artefacts obtained, aimed at generating specific reports for the relevant institutions, including conservation authorities. This form of schematic, practical action by prehistorians in relation to the object of research, which is the artefact and the context of its discovery, leads to the conclusion-making stage, described above as theory (cf. Rączkowski 2009, 25–26).

2.1. Philosophical emanations in archaeology – an outline of the issue

Regardless of the more scientistic or humanistic orientation of individual researchers in prehistory, in order to make a meaningful contribution to a particular section of archaeology, it is not partial, individual studies of a particular issue, but rather the broad interdisciplinary research of entire academic groups, in which a duality of discourse is the norm: (a) quantitative, qualitative analyses, including various specialised, revealing facts versus (b) pro-interpretative activities, referring to analytically demonstrated findings and explaining phenomena and processes with regard to the social sciences and humanities (e.g. Hildebrandt-Radke *et al.* (eds.) 2011; Przybyła *et al.* (eds.) 2013; Olalde *et al.* 2018; Kadrow and Müller (eds.) 2019; Kopacz and Wolski 2019; Wolski 2021).

Modern archaeology as viewed by the philosophy of archaeology is a discipline that interprets human history, always based on only fragmentary material relics. It is argued that in the process of inference there is a "contamination" of the cognitive subject by its own reality (Mamzer 1998; Pawleta 2016, 13–14), as well as a supremacy of thinking in objectivist categories (i.e. a closed, unchanging system: e.g. Hetmański 2015). Consequently, achieving an interpretive optimum, devoid of superficial explanations, requires adopting a particular theoretical perspective: *ocena jakiejkolwiek pracy na temat odległej przeszłości winna brać pod uwagę nie tyle prawdziwość wypowiadanych sądów, które są niesprawdzalne z racji nieobecności przeszłości, lecz spójność i logiczność interpretacji i argumentacji, a także siłę jej perswazji oraz przekonywania* [*evaluation of any research on the distant past should concern not so much the truth of the formulated statements, which cannot be validated due to the absence of the past, as the cohesion, logic and persuasiveness of the proposed interpretation and argumentation*] (Pawleta 2009, 451), as well as the strength of its persuasion and conviction. Hence, when attempting to refer to phenomena in prehistory, which in fact – due to the rudimentary nature of the available materials – can only be fragmentarily perceived, one should take into account not the authenticity of the referenced narrative, which is unverifiable due to the absence of the cognitive subject in prehistoric times, but the transparency and logic of the argument, as well as the power of intentional, even quasi-performative influence on the scientific community (in the sense of a creation of past reality expressed not only in speech, but also in the written word, using appropriate imagery; on the subject of

performative statements: cf. Austin 1993; Brożek and Kasprzyk 2007).

In contemporary archaeological discourse, the standpoint that new insights into the problem of understanding the past can be provided by philosophical inspirations is increasingly taken (Rączkowski 2009, 20; cf. Mamzer 2020). In such a view, archaeology becomes, as indicated, a highly interpretative discipline, being a kind of area of philosophical emanation, with researchers integrated into an "interpretive system" reaching out to the theoretical concepts of various thinkers. The notion of "hermeneutic understanding", used in attempts to get at the intentions, beliefs and actions of prehistoric man in his own world, is imposed here. In hermeneutic archaeology, what we understand unavoidably remains incomplete, and by its incompleteness open to further consideration. Such an approach prescribes alertness and distance from "established" knowledge, as well as from one's own beliefs and prejudices, which influence one's perception and judgement of the object of knowledge. In the sense of archaeological hermeneutics, even the most established knowledge may need to be reconsidered and a new and different meaning explored. The interpretive experience brings the prehistorian-theorist into a circular relationship of whole and part. On the one hand, it is necessary to understand the object of knowledge as a whole in order to be able to properly understand any of its parts, and on the other hand, it is required to know that object in each of its parts in order to be able to comprehend it as a whole (Gadamer 1993; Grondin 2007). Of course, it would be necessary in this context to decisively distance oneself from methodological anarchism, articulated as anything goes (Feyerabend 1996; cf. Zamelska 2004).

In spite of the unavoidable cognitive limitations of a researcher reaching the prehistoric reality along winding paths and, what is connected to it, the involvement of the prehistoricist as a cognitive subject in the process of cultural co-creation of the present rather than the past, Aleksander Dzbyński's work (2008) entitled *Rytuał i porozumienie. Racjonalne podstawy komunikacji i wymiany w pradziejach Europy Środkowej* [*Ritual and Understanding. Rational Bases of Communication and Exchange in Prehistoric Central Europe*] should be considered an example of a very successful application a concrete philosophical concept to the archaeological ground. The cited author, through the argumentation and exploration of special processes taking place in prehistory, tries to undertake a hermeneutically inspired reflection on the rational aspects of human functioning in the Eneolithic world (~2nd half of the 4th millennium BC to 2nd half of the 3rd millennium BC), with reference to the idea of number and metrological concepts as particular communicative markers preserved in material culture. The researcher attempts to reach the mind of man from the Younger Stone Age (~2nd half of the 6th millennium BC to 2nd half of the 3rd millennium BC), tracing the origins of numbers and measures in the space of social communication. The thesis is that the emergence of the metrological dimension in social relations at the beginning of the agrarian economy in Europe directly influenced social differentiation, the development of inequalities and the formation of hierarchies (in order to provide the most appropriate representation of A. Dzbynski's conception as outlined in his work, this study uses a review by Michał Pawleta (2009)).

The monograph by A. Dzbyński is one of the few convincing attempts in archaeology to draw on critical theory and Frankfurt School thought. The author discusses the issue of communicative rationality, based on the German thinker Jürgen Habermas's two-volume work *Teoria działania komunikacyjnego* [*The Theory of Communicative Action*] (1999; 2002). For J. Habermas, the key initial term is "communicative competence", taken as a certain universal capacity to understand and create rules for communication, appropriate to the social situation, where language has a catalytic function in the complex process of "coming to an understanding". Another relevant definiendum, "social evolution", is described as a: *postępująca racjonalizacja obrazów świata uspołecznionych jednostek ludzkich* [*process of increasing rationalisation of worldviews by socialised human individuals*] (Dzbyński 2008, 22). In the course of this evolution, there is a gradual transformation of communicative action into a completely new stage – ritual practice, conventionally performing social-integrative functions, is replaced by the "authority of consensus"; thus, the sphere of the sacrum is displaced by the sphere of rationalised communication. The transformation occurs through the linguisticisation of norms established through tradition, thus releasing the potential hidden in the rationality of communicative activity: *Promieniująca z sacrum aura zachwytu i przerażenia, oczarowująco-zaklinająca moc świętości, ulega sublimacji i zarazem powszednieje, przechodząc w wiążąco-spajającą moc poddawanych krytyce roszczeń ważnościowych* [*The aura of awe and fear radiating from the sacrum, the bewitching and charming power of the sacrum, is sublimated and at the same time made commonplace, passing into the binding and cohesive power of the validity claims under criticism*] (Habermas 2002, 140; all translations of quo-

tations and terms from Polish-language publications into English – DW). In the reasoning of A. Dzbyński, who uses the remains of material culture preserved in the archaeological record as inferential material, the concept of relieving the linguistic medium by way of reaching understanding, through extra-linguistic media of communication, in the form of various types of utilitarian objects, is presented (Dzbyński 2008, 23).

The axis of A. Dzbyński's work is thus the evolution of communication systems among early agricultural communities in Central Europe, defined as rationalisation (Dzbyński 2008, 34). J. Habermas's concept serves the author as a philosophical parallel in his study of the genesis and occurrence of the phenomenon of: *metrologizacji kultury materialnej, czyli nad powstaniem i ewolucją pierwszych miar na płaszczyźnie komunikacji społecznej* [*the metrologisation of material culture, i.e. the origin and evolution of the first measurements at the level of social communication*] (Dzbyński 2008, 20). The author analyses the formal features of artefacts (flint tools: macrolithic blades, axes; but also ceramic and metal pieces – copper/bronze), emphasising the communicative aspect of interference in their shapes and dimensions, such as fragmentation procedures or modification of forms. The reflection covers various production techniques, the distribution of tools and their exchange. The metrical changes of the artefacts mentioned above are examined (always in connection with specific taxonomic units distinguished by archaeologists, i.e. archaeological cultures). A. Dzbyński comes to the conclusion that in the case of the analysed cultures/societies of the Younger Stone Age, a repetitive phenomenon of the reproduction of a specific system of measurement is observable, which could be linked to the transformation of the rules of communication. The metrological concept, which is the product of rationalised communication, would tend to recognise Eneolithic man's familiarity with the traditional concept of measure and the rules for dividing proportions, into halves, quarters, etc. (Dzbyński 2008, 127–129).

A. Dzbyński tries to present his project in a very broad temporal and territorial framework. As mentioned, the evolutionary rationalisation progressing throughout prehistory was based, according to the cited author, on two basic elements: (a) the process of achieving understanding through the verbal medium of communication, which is language, and (b) the relieving of language by non-verbal, material mediums of communication. It is an indisputable fact that, with the passing of centuries and millennia, there has been a transformation of economic systems from assimilative to productive, and there have been technological developments. At the same time, according to A. Dzbyński's conception, there was a successive decrease in the importance of linguistic communication – from the narrative model (Palaeolithic, Mesolithic, hunter-gatherer) to the achievement of metrological consensus (Bronze and Iron Age, developed agrarian system, advanced metallurgy). Epochally, the critical phase of transformation was to be the Neolithic (developing agriculture, farming and the beginnings of copper and bronze metalworking), when narrative itself loses its power in favour of new, material media of communication – this stage has been described as metrological-narrative (Dzbyński 2008, 30, 230). As M. Pawleta notes in his review of A. Dzbyński's discussed work: *stadia te znamionują stopniowy proces odczarowania świata, czyli odchodzenia od myślenia w kategoriach magicznych (synkretyzmu kulturowego) na rzecz kryteriów racjonalnych i wydzielenia się aspektów techniczno-użytkowych, komunikacyjnych oraz światopoglądowych* [*The stages point to a gradual process of "unbinding the spell-bound world", i.e. to the move from thinking in magical terms (cultural syncretism) towards rational criteria, and to the emergence of technical-functional and communicative aspects and outlooks*] (Pawleta 2009, 460; cf. Dzbyński 2008, 235).

To conclude, in the book by A. Dzbyński briefly presented here, an ambitious attempt was made to reach the phenomena enclosed in the scraps of the material culture of the distant past. In spite of the fact that the author of *Ritual and Understanding* adopts a point of view that is visibly marked by idealism, and finally, perhaps, by an over-universalist approach to the issue and an attempt to interpret the changes in the processes of communication from the Palaeolithic to the present day, there is no doubt that the message coming out of the monograph is cognitively absolutely unique, and in the context of this work, it clearly reveals the possibilities of interaction in the philosophical and archaeological field.

2.2. Philosophy of technology – selected concepts: tool, work, and creation

Let us assume that by the term "tool" we would like to understand *an item or a simple device directly affecting another item, which as a result of performing* [...] *some work is to be changed* (https://encyklopedia.pwn.pl/szukaj/narz%C4%99dzie.html, access: 11.11.2023). In contrast to the encyclopaedic approach presented above, according to which the term we are interested in is considered on strictly functional grounds, a tool

can also be perceived purely formally – as a product characterised by certain typological features, such as shape, stylistics, size or method of its retouching. This type of understanding is appropriate for archaeology, whose researchers, going back even a few million years, empirically reach the origins of the tool sphere and analyse the stages of technological progress, in connection with the development of language and communication among representatives of the genus Homo (e.g. Vyshedskiy 2019). On the axis of successive hundreds of thousands of years, more and more complex conceptual operational schemes on products made by human hand (from simple chopper forms, through the use of core techniques, to the reduction of cores in volumetric type, including microlithic ones) are found in tool inventories Archaeological terminology – especially that concerning pieces made from the most archaic raw materials, i.e. various stone tools, created before the development of specialised methods of analysing the function of artefacts (broadly defined as traseology – optical, scanning and confocal microscopy), today results in the widespread use of associative and intuitive names among prehistorians referring to the forms of artefacts and their presumed functions (such as scrapers, burins, perforators, sickles, etc.), rather than to their actual use by early man. As a result of the historical circumstances described above, the archaeological definition of the term "tool" has two different aspects, often causing controversy in academic discourse: functional and formal (cf. Wolski 2020, 18–20).

The introduction presented, which reveals a certain terminological complexity in the discipline of archaeology (and it is worth noting that, among academic disciplines, it is one of the most representative ones referring to the study of man in the aspect of the history of his material culture), leads to the philosophical revealing of the tool as a definiendum. What is it, how was it perceived by prehistoric man, and how is it seen today? In order to reflect on its ontological status, the author first makes use of statements by M. Heidegger, lightly supplementing, for the purposes of the discussion, the conceptual scope related to toolhood with terms such as "technique" and "work". This way of presentation will allow a more complete, contextual view of the subject of toolhood to be shown.

M. Heidegger characterises in his work *Bycie i czas* [*Being and Time*] the elements that make up the essence of a tool. As one of its designations, indeed as an inherent existential feature, he singles out "handiness" (*Zuhandenheit*), defining the tool's mode of being "in which it reveals itself" (Heidegger 2013, 88). The quoted philosopher gives tools as entities the property of being, and through handiness indicates their existence: […] *jestestwo jest ontycznym warunkiem możliwości odkrywalności bytu, który jest spotykany w świecie, mając sposób bycia powiązania (poręczności) i tak może się ujawniać w swym „w-sobie"* [[...] *Dasein is the ontic condition of the discoverability of an entity that is encountered in the world, having a mode of being of association (handiness) and so can reveal itself in its 'in-self'*] (Heidegger 2013, 112). Thus, if we use a tool, we do not think about its essence (the more perfect it becomes, the more it disappears in the hand, i.e. it "withdraws into handedness": cf. Marzec 2018, 91), but focus on the accomplishment of the task – exploration, reshaping, any physical interference with another object. According to M. Heidegger, tools in the course of performing an activity with them are invisible to the user, *gdyż jako poręczne (zuhanden) i wykonujące zleconą im pracę, jednocześnie znikają zakryte posługującą się nimi ludzką ręką. Przedmiot ujawnia swoją obecność jedynie wtedy, gdy psuje się i zaczyna działać wadliwie. Wówczas, jako nieprzydatny, wyjątkowo pojawia się przed ręką (vorhanden), przechodząc tym samym z obszaru praktyki do sfery teoretycznego oglądu* [*for as they are handy (zuhanden) and do the work assigned to them, they simultaneously disappear covered by the human hand that uses them. An object only reveals its presence when it breaks down and begins to defect. Then, as useless, it exceptionally appears in front of the hand (vorhanden), thus passing from the space of practice to the sphere of theoretical view*] (Marzec 2018, 90–91).

In addition to the attribute of handiness, M. Heidegger reveals further distinctive features of the tool in his work, called "references". A tool is: (a) "to perform a certain action", (b) "to be used with other tools", (c) "to be used for some purpose", (d) "to be used by someone" (Heidegger 2013, 111–113). This four-faceted nature of the tool can be given the following conceptual translation in turn: (a) servitude – what the tool is used for ("handling of tool"), (b) usefulness – what the tool is useful towards ("workshop"), (c) applicability – what can be achieved with the tool ("purpose"), (d) convenience – for whom the tool is suitable ("user"). As Jadwiga Wiertlewska-Bielarz (2010, 21) concludes, *narzędziem zatem jest coś, co zostało z czymś, w celu, przez kogoś, jakoś użyte* [*a tool, then, is something that has been used with something, for a purpose, by someone, somehow*]. "Manipulation" or "manipulative-utilitarian preoccupation", or simply the handling of a tool (Heidegger 2013, 86–89), leads to the disclosure of its attributes and thus results in its determination in rela-

tion to its environment. Importantly, what is irremovable in an essential sense is only the handiness – it is what gives the tool status to the being and defines its being. Thus, what is servile, useful, applicable or convenient does not have a principled character for the tool, but only a modal one, circumstantially agreeable to the world. Reducing M. Heidegger's complex terminology to a rudimentary, or a certain simplification of his outlook, it could be argued that without the human perspective, the being of a tool would never have had the chance to come to light. For it is the human being who performs the "manipulation", i.e. the type of "pro-possibility" activity undertaken (*sposoby bycia jestestwa są niejako sposobami dostępu do specyficznych sposobów bycia bytów z otoczenia* [*the ways of being of Dasein are, as it were, ways of accessing the specific ways of being of the surrounding entities*]) (Wiertlewska-Bielarz 2010, 21), gains access to the tool, thus revealing its few-dimensional nature outlined above (cf. Wiertlewska-Bielarz 2010, 21–23). In other words, if we disregard the subject-object complexity of the relation, ignore being by focusing only on entities, out of context objects would lose their subject reference. A hammer used by a carpenter will be a hammer as long as it serves as a tool for hammering nails (cf. Heidegger 2013, 88). Thus, the moment its use is abandoned, although it has its weight, still has its potential functionality and is among other tools, it loses its direct reference to the one who used it.

Sentences such as: *Poręczność (narzędzia) oznacza istotową dyspozycyjność dla człowieka* [*Handiness (of a tool) implies an essential disposition for man*] (Hoły-Łuczaj 2013, 98) or […] *u „wczesnego" Heideggera stosunek człowieka do rzeczy sprowadza się do użyteczności* [[...] *in the Early Heidegger, man's relation to things is reduced to utility*] (Hoły-Łuczaj 2013, 98) reinforce the conviction of the analysed thinker's purely instrumental approach to the essence of a tool. As can be seen, there is a lack of direct translatability of Heideggerian reasoning into the formalistic view of tool and toolhood known in archaeology, i.e. based on morphometric and typological categories (differently with regard to its functionality: cf. the beginning of this subsection).

In another essay entitled *Pytanie o technikę* [*The Question of Technique*], the late Heidegger (2002), as if in controversy with his convictions in *Bycie i czas* [*Being and Time*], seems to criticise the contemporary instrumentalist attitude towards the tool, or more broadly towards the technology itself leading to the final product, which is the tool. Based on an analysis of the Greek concepts *techne* ("means to an end") and *poiesis* ("the act of man"), the quoted author emphasises the extra-utilitarian value of creation as extraction from the state of nature, which is supposed to be related to the understanding of the concept of art: *Techne należy do wydobywania, do poiesis: jest czymś poetyckim* […], *jest sposobem odkrywania* [*Techne belongs to extraction, to poiesis: it is something poetic* [...], *it is a form of disclosure*] (Heidegger 2002, 231). Meanwhile, the contemporary understanding of technology seems to be reduced to matters of utility and pragmatism, hence *only techne extracted, arising in poetry, can reveal true thinking* (Rebes 2016, 141). M. Heidegger *chce by współczesne myślenie stało się rękodziełem, ręczną robotą, a nie dziełem maszyn. Reguły seryjnego wytwarzania sprawdzające się w świecie działań techniczno-instrumentalnych zawodzą w świecie myśli, niszczą bowiem jej dzieła* [*wants modern thinking to become a handcraft, a manual work, not the work of machines. The rules of serial manufacturing that succeed in the world of technical-instrumental activities fail in the world of thought, for they destroy its creations*] (Maślanka 2004, 177). The obscuring of the essence of technology the thinker of our interest seems to correspond to the confusion of the essence of man himself. "The being of a technology", or the "being of a tool", becomes comprehensible not by giving the technology or the tool purely functionalist qualities (e.g. "a hammer is used for hammering nails" or "an axe for chopping wood"), but above all by seeing in the subject-object relationship meanings defined by the current context of the one acting. One could say: a tool is not a tool because it has been made, but it has been made in order to be a tool. It is not only meant to perform specific functions, but also to "give inspiration", to "constitute a gift", or – which can be read as the quintessence of Heideggerian hermeneutics – to "allow itself to appear as present-at-hand" (cf. Barański 2008, 24–26).

If one were to treat the Heideggerian concept of toolhood as universal for all places and times, then the "making present" of the tool, and thus of essentiality in the object-subject relationship with man, would also be directly referable to prehistoric times. Adopting such a theoretical perspective would hereby reduce the powerful position in today's philosophy of archaeology that in the process of inference the cognitive subject becomes involved in its own reality, so that the attempt to comprehend the past becomes, as already emphasised in an earlier subsection, a misleading construct rather than a reliable reconstruction.

In the follow-up to M. Heidegger, analyses of concepts referring to "work" and "creation", which orig-

inated mainly in Greek, are undertaken by Giorgio Agamben and Hannah Arendt in their studies (with reference to archaeological discourse: cf. Mugaj 2017). In the reflections of the first of the aforementioned philosophers (Agamben 1999), the terms *poiesis* and *praxis* appear, in their articulation more or less coinciding with Heideggerian thought. *Poiesis* wants to understand G. Agamben as a creative activity that goes beyond its own self, or as an activity that gives existence and brings truth to the light. *Praxis*, on the other hand, is a kind of activity closed in on itself and refers to production limited by its own inherent framework. The author sees in the historical process a fusion of the meaning of both terms. As a result, *poiesis* stops being understood as a creation and transforms into a product which is a commodified realisation of the will of the producer. The *techne*, mentioned above, also becomes nothing more than a commodity, which loses its extra-practical face and acquires a purely instrumental character (Agamben 1999, 42–50; cf. Heidegger 2002).

H. Arendt, in her book *Kondycja ludzka* [*The Human Condition*] (2010), seems to argue about the notions of "work" and "creation" in a not very different way than in a post-Heideggerian manner. The term distinguished by the philosopher and referring to man's physical activity, *vita activa*, is the starting point for further reflections on human "action". At the bottom of this hierarchy is the "work" that implicates man in the nature (*praca naszego ciała i dzieło naszych rąk* [*the work of our body and the work of our hands*]) (Arendt 2010, 87), where, as *animal laborans*, he focuses on the necessity of survival, immediately consuming the produced, perishable goods needed to sustain basic existence. "Creation", on the other hand, is the task of *homo faber*, who, being capable of modifying nature, creatively gives a new quality to the material objects brought to life in the made-up world. While "work" can be described as a repetitive, never-ending process, the result of "creation" is single, unique, permanent and – what is important – individualised, able to be realised through interpersonal exchange: *homo faber, budowniczy świata i wytwórca rzeczy, może odkryć właściwą więź z innymi ludźmi, tylko wymieniając się z nimi swoimi wytworami, ponieważ same te produkty są wytwarzane w odosobnieniu* [*homo faber, the builder of the world and the maker of things, can only discover a proper connection with other people by exchanging his products with them, since these goods themselves are produced in isolation*] (Arendt 2010, 189). The objects obtained in the course of creation serve to build the world by objectifying it (Arendt 2010, 166). The highest level of *vita activa* is "action", manifested through human social activity as a form of striving to function together, where mutual interactions allow for full human being (Arendt 2010, 11–12).

2.3. Pivotal concepts: dichotomy, divergence, convergence

A chance to answer the research questions of the presented paper, or at least to create favourable conditions for an even clearer highlighting of the problem of the tool dichotomy and its understanding, may be provided by confronting archaeological knowledge with dual philosophical concepts. The intended effect can be attempted to be achieved through the prism of the issues discussed since antiquity based on binary oppositions (e.g. dualism versus monism, empiricism versus rationalism, idealism versus materialism, induction versus deduction, causalism versus finalism, a priori versus a posteriori, etc). The author of this work, the scope of which is strictly defined, does not aspire to provide a profound explanation of the antagonisms indicated, but only to use selected examples of this type of opposition in order to achieve the intellectual objective that has been set.

A binary division, in which a certain category of a superior term is split into two mutually exclusive subcategories, can be referred to as a dichotomous divide (Karwat 2012, 11). On lexical, as well as epistemological grounds, it assumes the existence of linguistic and cognitive antonyms, i.e. notions standing in opposition to each other (e.g. "yes-no", "there is-there is not", "for-against", "small-big", "young-old", "satiated-hungry", "warm-cold", "good-bad", "true-false", etc.). As can be seen from the cited examples, opposition exists not only within the framework of linguistic conventions alone, but also in the relation of the cognitive subject to the surrounding reality, which is unavoidably accompanied by the subjective aspect of the reception of impulses from it, and their further processing and evaluation. A dichotomous division as a logical system must fulfil certain formal conditions: (a) it must be made according to a single criterion, (b) the scopes of the distinguished two notions must be inseparable, (c) the separated two parts must together complement the initial notion (Karwat 2012, 15–29). In the context of the present study, the archaeological dichotomy in the sphere of toolhood at the turn of the Stone Age will be constituted by its two distinct lines: opportunistic and specialised (cf. Tab. 1).

Referring to historiosophy, the term "dichotomy" already appears in Greek philosophical sources as the

name of one of the paradoxes of Zeno of Elea (Wesoły 2013, 73). References to binary oppositions, not explicitly called dichotomy or dualism (both concepts are used synonymously in this paper, although they may be perceived differently in the philosophical tradition), but relating to terms that contradict each other, are also evident in Aristotle's concept of the "golden mean", understood as the search for a compromise between extremes, or, in other words, the right measure between "too much" and "too little" (https://www.newworldencyclopedia.org/entry/Golden_mean_(philosophy), access: 11.11.2023; https://plato.stanford.edu/entries/aristotle-ethics/#DoctMean, access: 11.11.2023).

The antonymic schema is also evident in the Hegelian dialectical process, where a unifying construct, i.e. synthesis, is formed from two opposing terms or phenomena – thesis and antithesis. The three-part system results in the combination of concepts into increasingly complex structures – new entities incorporating the earlier dichotomies (Rosiak 2011, 18–20).

Terms close in meaning to the dichotomy are "divergence" and "convergence". However, while the dichotomy may be perceived as a static, fixed image of reality, the newly introduced definienda can also be understood as a process of divergence or convergence, which is particularly important in the aspect of the study of man and his culture carried out by the author of the present work. Etymologically, both names have penetrated from mathematical and physical sciences to social, legal and natural science disciplines, as a result of which a thesis has been established: under similar conditions, in different places and cultures, similar constructs – divergent and convergent – may be created independently or depending on each other (Tokarczyk 2012, 5; with regard to convergence: cf. Kopaliński 1994, 278). In contrast, the anthropological antonym for the concept of convergence, namely divergence, is described in the dictionary as: *wtórne różnicowanie się* [...] *cech i elementów w odizolowanych od siebie kulturach, spowodowane zmianą ogółu warunków środowiskowych i zewnętrznych wpływających na rozwój kultury* [*a secondary differentiation* [...] *of features and elements in isolated cultures, caused by a change in the totality of environmental and external conditions affecting the development of a culture*] (Olechnicki and Załęcki 1997, 50).

In a cultural studies sense, convergence can be seen in another way: […] *to zjawisko lub pewien proces, w którym obserwować możemy zmieniające się i wzajemnie przenikające zależności pomiędzy treściami* [...] *kulturowymi* […] *oraz ich twórcami i odbiorcami. Za pomocą technologii producenci szukają nowych rynków zbytu* […], *a odbiorcy chcą znaleźć inne, ciekawe i kreatywne formy współuczestniczenia w tych zjawiskach oraz ich współtworzenia* [[...] *is a phenomenon or a certain process in which we can observe a changing and interpenetrating relationship between* [...] *cultural content* [...] *and its creators and users. With the help of technology, suppliers are looking for new markets* [...], *while recipients want to find other, interesting and creative forms of participation in these phenomena and their co-creation*] (Jaskowska 2008). The opposite of this state, emphasising also the cultural studies sense, will be the divergence of expectations, interests and actions of suppliers/creators and recipients/users.

For the author of the publication, the presented terminological suggestions are an important contribution to the attempt to verify the translatability of the functioning of the conceptual apparatus appropriate to the interdisciplinary contexts quoted into archaeological scope, which is expected to provide an interesting exploratory result.

3. In the net of binary oppositions: divergent and convergent mechanisms in dual post-Neolithic technology on the ground of structuralist thought

The key terms analysed so far will acquire a common sense when the concepts of divergence and convergence, introduced above, are integrated into the archaeological discourse seen through the prism of structuralism (Lévi-Strauss 2021); of course, this is not in the full view of this intellectual orientation, but in the light of some of its elements. The choice of interpretative trajectory becomes important for the present work not only because it fits into the model of the inference adopted, but also because structuralism as a somewhat scientistic orientation, or aspiring to be scientific, finds a reference to both archaeology and philosophy (i.e. as fields themselves in some difficulties with their ontological status). The author's understanding of the structuralism in its "non-dogmatic" version he would like to articulate carefully in order to avoid contradictions with reasoning of the hermeneutic type (cf. Januszkiewicz 2018, 186–189), declared as a methodological point of reference for the interpretative content of this paper.

The structuralists wanted to: *naukowo opisać* [...] *świat (znaczeń) takim jakim jest on w swej istocie, aby* [...], *stworzyć gramatykę kultury odwzorowującą rzeczywiście istniejący w niej ład* [...]. [Strukturalizm

stanowił – ed. DW] *o kompletnym opisie wszystkich istotnych relacji kulturowych, co do których żywił przekonanie, iż ukrycie już istnieją, czekając jedynie na swe ujawnienie (stąd właśnie wzięła się najpopularniejsza metafora strukturalistów: metafora geologiczno-archeologiczna – zalegania pod powierzchnią, odkrywania, dokopywania się, zdzierania powierzchniowych warstw, pójścia w głąb itd.). Dzielił świat na to, co konstytutywne (ważne, rozstrzygające, centralne, determinujące resztę, nadrzędne, proste i podstawowe) i to, co pochodne (powierzchniowe, marginesowe, zamazane, chaotyczne i przygodne)* [*scientifically describe* [...] *the world (of meanings) as it is in its essence, in order* [...], *to create a grammar of culture that reflects the order actually existing in it* [...]. [Structuralism was – ed. DW] *about the complete description of all essential cultural relations, for which it was convinced that they already existed secretly, just waiting to be revealed (this is where the most popular metaphor of the structuralists came from: the geological-archaeological one – lying under the ground, discovering, digging in, going deep, etc.). He divided the world into the constitutive (important, conclusive, central, determining the rest, superior, simple and fundamental) and the derivative (superficial, marginal, blurred, chaotic and adventurous)*] (Szahaj 1993, 5–6). The structural method is not meant to lead directly to the construction of meaning (as modern mainstream prehistorical theorists would like to show past reality: cf. subsection 2.1), but to its detection by means of an analysis of the interconnections of all the components of the system. *Stosowanie analizy strukturalnej jest próbą dania absolutnych rozstrzygnięć tłumaczących zjawiska kulturowe i próbą zintegrowania całej humanistyki w totalnym pojęciu struktury, gdzie w strukturze tej wyrażona jest pewna uniwersalna racjonalność zawartych w niej tworów* [*The use of structural analysis is an attempt to give absolute solutions to explain cultural phenomena and an attempt to integrate the whole of the humanities in a total concept of structure, where in this structure is expressed a certain universal rationality of the creations that it contains*] (Ruciński 1971, 214–215). Thus, instead of relativistic thought, a kind of intersubjectivity is to be revealed in interpretation. Such an effect is to be achieved: *dzięki daleko posuniętej formalizacji materiału,* [...], *tj. faktów kulturowych, co prowadzi do sprawdzalnych twierdzeń na temat ich wewnętrznej organizacji, mechanizmu funkcjonowania i mechanizmu znaczenia* [*through a far-reaching formalisation of the material,* [...], *i.e. cultural facts, which leads to verifiable claims about their internal organisation, mechanism of functioning and mechanism of meaning*] (Ruciński 1971, 216).

According to the structural method, the aforementioned "facts" form systems as logical wholes whose elements are so-called possibility structures (models). Ultimately, the actually produced system consists of fragments of realised possibilities, where: *znaki językowe, a dokładnie interpretanty* […] *powiązane są ze sobą siecią rozmaitych relacji, wyznaczających funkcje elementów w systemie* [*linguistic signs, or more precisely interpretants* [...] *are linked to each other by a network of various relations, determining the functions of the elements in the system*] (Ryż 2013, 14). Possibility systems can infiltrate each other – at the level of the models themselves, as well as their individual elements. *Ta wzajemna przekładalność pozwala na zarysowanie* [...] *syntetycznego i totalizującego obrazu kultury ludzkiej* [*This inter-translatability makes it possible to outline* [...] *a synthetic and totalising picture of human culture*] (Ruciński 1971, 216–217), capable of being interpreted in a very specific way in all places and times within the structuralist paradigm.

In the above view, a given systemic structure appears to be a self-sufficient creation, although, of course, it must have previously differentiated and demarcated itself from the "environment" (surroundings), creating a new ontological quality. [The environment – ed. DW] *wciąż w pewnym sensie oddziałuje na system, ale o charakterze tych oddziaływań decyduje już sam system, który na warunki otoczenia reaguje zgodnie ze swoimi wewnętrznymi regułami na podstawie wcześniej wytworzonych wzorów* [*still interacts with the system in a certain sense, but the nature of these interactions is already determined by the system itself, which reacts to the conditions of the environment according to its internal rules on the basis of previously generated patterns*] (Ryż 2013, 51). One of the main principles is that the order of the system must be characterised by a hierarchical (though not necessarily valuational) organisation, the analysis of which requires, in the first instance, a description of the larger things so that the smaller things can be observed from an appropriate perspective (Ryż 2013, 22, 27), according to the order "from the general to the particular".

The formation of a system can be associated with the Heideggerian extraction of "creation" from the state of nature, which results in the origin of the tool's pro-possibility-potential already in the non-natural sphere of culture. In this space, however, the tool does not yet acquire the status of "handiness", but only pretends to this status, without being a fully "cultured" element. The dualistic reference to structuralist thought is well taken in this context: *Pojęcie kultury* [...] *rozumiane jest przez strukturalistów w opozycji do pojęcia*

natury. Jakkolwiek często następuje dyfuzja przedmiotów należących do dwu dziedzin — natury i kultury [*The concept of culture* [...] *is understood by structuralists in opposition to the concept of nature. However often there is a diffusion of objects belonging to two domains – nature and culture*] (Ruciński 1971, 214).

Looking at typical post-Neolithic settlement toolkits (cf. subsections 1.1 and 1.2 of this article), tools belonging to the opportunistic line had to be extracted from the state of nature quite easily (cf. Tab. 1; Fig. 1). Minimal or no technological investment led to the rapid utilitarian success of a given piece, which was used "in relation to something" (a specific organic or inorganic material), "for some purpose" (most likely in the carrying out of a simple, one-time activity), "by someone" (by anyone on the settlement – a non-specialist), "somehow" (short-term working, without remaining distinctive, evident microtraces). Such a mono-functional tool, used once, then abandoned and forgotten, lost its object reference after the work was done with it, disappearing into the past. It only gained renewed interest and significance in the course of its possible reutilisation or when it was found by prehistorians hundreds and thousands of years later.

The situation is different in relation to the tools belonging to the specialised line (cf. Tab. 1; Fig. 2), which are characterised by the pietism of processing and refinement of bifacial macrolithic implements. Flint forms of the highest quality, as being the domain of specialist makers – most likely not farmers, but traders-craftsmen, hermeticising their resources of knowledge and skills, ensuring the intergenerational transfer of these intellectual and competence-manual goods within a narrow, elite group – had to be treated with the highest respect, almost with pathos, by the post-Neolithic population of agricultural and farming settlements, i.e. the recipients/users of bifacial sickles and daggers. Items of this type were meant to provide prestige, but at the same time they had utilitarian functions, only that they were very specific, because they were linked to the seasonality and circularity of the activities. Macrolithic tools presumably remained in use even in the intergenerational cycle, constituting a kind of insignia in the sphere of post-neolithic toolhood. A distinguishing feature of the implements in question was their high resistance to defects (it is a rare phenomenon for flint materials), so that they stayed "handy" (*zuhanden*) tools *sensu stricto* for a very long time and not as quickly as other items left the sphere of practice (i.e. appearing "in front of the hand" – *vorhanden* – as defective, thus losing their tool dimension). In contrast to the opportunistic line, these were the highly specialised tools – in spite of the fact that they performed certain important economic functions – that were the Heideggerian "gift-bestowing inspiration", and at the same time, in a subject-object relationship, they "made themselves present" in the course of the activities performed, providing a current toolhood context for the acting individual.

When considering the duality of the tools of the breakthrough times, one is facing the question of whether there is a splitting (divergence) or a complementing (convergence) of the two orientations of the lithic industries. On the one hand, the externally visible duality can be seen as a hybrid system, stimulating the effective fulfilment of all basic economic activities. This hybrid could be attempted to be interpreted in terms of a desire to sustain the most harmonised co-operation of the polar elements and their integrity. From a theoretical point of view, in the phenomenon of polarisation, the principle is complementary rather than mutually exclusive relations. Also according to the central idea of structuralism, each of the system's components (models or possibility structures), even the seemingly most extreme ones, have to form a common structural skeleton necessary for the functioning of the whole. What is important is what interactions would have to take place between the representatives of two such different formal-utilitarian trends. It may well be that the parallel existence of "special" pieces (used cyclically) and "ordinary" items (used to satisfy elementary needs, formed on the basis of widely available raw materials and based on average knowledge and skills) among communities at the turn of the stone and metal era could have potentially stimulated the efficiency of the former economic system. With this type of conclusion, it is reasonable to believe that the interests of the creators/suppliers and recipients/users of macrolithic products were aligned, and the multi-aspect dichotomy established on the basis of the analysis and interpretation of artefacts was of a convergent nature – suppliers and recipients of special forms participated in the creation of socio-economic reality. In the light of the argument made by the archaeological material and the general humanities (Wolski 2019a; 2020; cf. the content of the present work), the author assumes that the convergence phenomenon may have clearly occurred in particular in areas located in close proximity to flint-bearing formations containing rocks of suitable quality for creating bifacial sickles and daggers. Such a region was Lesser Poland and Volhynia (cf. subsection 1.1), abundant in various types of flints of Jurassic and Cretaceous age (cf. Libera 2001, 77–82, 92–95; Wolski *et al.* 2018).

With reference to the Moravian flint artefacts from the turn of the Neolithic and Bronze Ages (subsection 1.2), which are significantly different in terms of the qualitative aspect from those known from the Lesser Poland area, it is no longer possible to talk about convergence as a phenomenon of common interests and benefits between creators/suppliers and users/recipients. On the contrary, the situation in Moravia indicates the non-complementarity of the two developmental lines of flint industries and thus the arrhythmia of this kind of economic and social relationship between their representatives. The insufficiency of the common cultural content needed to establish any social connection was probably influenced by the distance factor. Hence, long-distance luxury imports in the form of completed bifacial forms reached the Moravian settlements (which were hundreds of kilometres away from the deposits of high-quality raw materials and, consequently, also from the production centres) on a drastically smaller scale than the Lesser Poland settlements. Therefore, when interpreting flint materials from Moravia, it is similar to considering the applicability of not a convergent, but a divergent mechanism – where the commercial and interpersonal aspirations of the holders of both traditions were unrealisable due to geographical barriers, perhaps these traditions excluded each other, or at least did not complement each other *expressis verbis*.

Analysing further the issue of the transition from the Stone Age to the Early Bronze Age – keeping in mind the issues of the management of flint raw materials at the time and the social implications of this phenomenon – it is worth emphasising that a certain interesting intellectual construct has recently been obtained by borrowing from twentieth-century thinkers, including phenomenologists (Mugaj 2017; cf. Wolski 2019a, 211–212). Specific philosophical concepts have been connoted with the archaeological problem of our interest, but first, a principled division of the prehistoric axis into two developmental stages has been made: (1) the "traditional" lithic industries of the Upper Palaeolithic, Mesolithic, and Neolithic early agricultural groups, and (2) the "terminal" lithic industries of the Late Neolithic and Bronze Age. Adopting this model made it possible, with reference to the second of the identified phases, to outline an antagonistic concept differentiating two key concepts: "work" and "creation". Apart from philosophical works, Jakub Mugaj utilised publications on terminal lithic industries in order to present his perception of the dichotomy of turn-of-the-century from a humanist perspective. After first proposing the initial ontological and epistemological issues concerning the problem of technology and quoting the existentialist distinctions made by H. Arendt with regard to the essence of "work" and "creation" (cf. subsection 2.2), the author tried to establish a logical bridge between purely theoretical considerations and archaeological empirical research. Among the many dualities outlined in the article, it is worth recalling a few of the most significant: (1) "work" likened to the behaviour of an animal – *animal laborans* – driven by the necessity of survival versus "creation" as the domain of *homo faber*, who creatively transforms nature into an objectified, beyond purely pragmatic dimension; (2) the impermanence of the results of the effort invested in the activity of "work"; its effects are immediately digested in the life process versus "creation" as a form of activity resulting in the bringing to life of an object ("objectifying the world"); (3) the non-specialised, repetitive "work" called "the work of our bodies" versus "creation" understood as "the work of our hands", being the product of specialists; (4) the "public" sphere of technological behaviour versus the "private" sphere limited to a narrow group (Mugaj 2017, 148–149).

The relationality of the highlighted Arendtian dual concepts to the phenomenon of the formal-utilitarian dichotomy of terminal lithic industries, as characterised in the previous sections of the article (cf. subsections 1.1 and 1.2), seems to be unquestionable. The duality can be seen as the result of the socio-economic differentiation of 'work' and 'creation' – i.e. the specific determinants inherent in the technological system. Quickly made atypical tools, pauperised, characteristic of domestic, routinised everyday flint working, were to constitute (in the terms of the cited H. Arendt: 2010) "work", and therefore played a prime role in the daily maintenance of existence. The functioning of exclusive, high-quality tools provided for special purposes, on the other hand, corresponds to the definition of "creation", which was the responsibility of the few (cf. Mugaj 2017, 151–152).

Beyond the described formal and functional aspects, as well as the relevant philosophical constructs, the specialised line of the lithic dichotomy also seemed to be reflected in other social processes of the time of the turn. These, according to the author's view of the paper, are related to the phenomenon of transgenerational transmission of the idea of "creation" culturally symptomatic goods. The key mechanism stimulating cultural transmission was supposed to be the unavoidable, necessary historical conformism (cf. Sherif 1936; Asch 1955), functioning through the role of socially significant individuals, guarantee-

ing continuity and constancy in the intergenerational process of transferring highly specialised conscious as well as unconscious knowledge (Pelegrin 1990; Wolski 2014). As indicated above, it is very likely that their transmission from generation to generation took place through narrow channels within a hermetically closed group, possibly linked by family ties (cf. Fouere 1994, 505). Another factor of elitism may have been the specific rituals accompanying the "creation" process (for example, Mesopotamian cuneiform plates dated to the 7th century BC are supposed to demonstrate a sequence of various rituals – including offerings in honour of the ancient master-craftsmen – the performance of which guaranteed the obtaining of the intended end result, in this particular case items made of glass: Oppenheim *et al.* (eds.) 1970, 52 after Robinson *et al.* 2004, 139–140).

In conclusion, it is worth stating that, the multi-aspect dichotomy of the characteristics of lithic artefacts – measuring from the turn of the Stone and Metal ages up until the end of the Late Bronze Age – seems to be the result of an economic and social transformation rather than a purely technical one. A specific division of the communities of the prehistoric episode in question in terms of accessibility to exclusive knowledge and skills (metals, faïence or lithics) would represent a kind of controversy in relation to the concept, strongly established in the literature, of the profound egalitarianism of some Early Bronze Age populations – existing in a highly unified world, broken into local, conservative groups with a highly anti-innovation orientation (Kadrow 1995, 116–123; 2001; 167–178). From the perspective of the argumentation presented in this section of the article, the view of the kinship relations of craft groups involved in the "creation" of flint special tools would be equally valid.

Discussion and conclusions

The dichotomous nature of technology and society at the turn of the Neolithic and Bronze Ages as a philosophical topic of consideration appears to be, on the one hand, a difficult task (it is still *terra incognita* in the field of archaeology) and, on the other hand, extremely inspiring. For the author, it is clear that in order to comprehend the multidimensionality of the epochal transformation processes – in Central and Eastern Europe, but not only there – it is necessary to cover the whole issue with extensive humanistic interpretation formulated not only in connection to archaeological analysis of features of the artefacts. The result of such a directed attempt is the content of this paper.

The concept of a flint tool and the whole system of raw material management, as this article has sought to show, has a completely different specificity at the turn of the epoch than in previous prehistoric periods. The qualitative transformation of flint working processes in the period in question set a new historical course towards the area associated with metal working (the equivalents of bronze artefacts – daggers and sickles – refer directly to the specialised line of the dual tool reality, rather than to *ad hoc*, quickly obtained, atypical products of everyday use). Hence, for the fullest possible understanding of the complexity of inter-epoch transformations, the interpretation of terminal lithic industries as not only a technological but also a socio-economic phenomenon should, in the author's opinion, be unavoidably accompanied by dualistic optics.

Purely heuristically, an attempt could be made to extrapolate the phenomenon of dichotomy occurring in relation to flint technologies to other areas of expert manufacture: metal or perhaps faïence. Such an approach would supply the basis for considering the social system in the era of the transition from the Stone Age to the Metal Age, one of the manifestations of which is taken to be the processes of divergence included in the earlier parts of the article – resulting in the differentiation of human communities of the time into two classes: "working" and "creating". The return of pre-dualistic convergence, typical of the Neolithic and older prehistoric periods, would have been gradually evoked with the progressive unification of Bronze Age societies (with increasing prosperity and wealth), synchronously with the expiration of the dualistic phenomenon – i.e. when "creation" based on advanced technologies, not necessarily just lithic industries, became anew shared by the majority (cf. Mugaj 2017, 151–152).

Analysing lithic issues during the epochal turn in Central and Eastern Europe, both north and south of the Carpathian arc, references to the social system are discernible, with an indication of the so-called dualistic organisations operating within it (Lévi-Strauss 2021, 139–169). C. Lévi-Strauss, inspired by the Durkheimian construct of *homo duplex* (which presupposes the perception of man as a dual being: determined both biologically and socially), searched for fixed and unchanging features of human nature. In line with the concept of the collective unconscious, in connection with the formation of rules of social organisation, the cited thinker considered dualism to

be the law of the functioning of the human mind, undistorted by the process of awareness and subjectification. In a dichotomous view of the world, there was to be a structuring of traditional populations within the framework of culture as a whole, composed of ideal patterns formulated by the unconscious, which societies aim at (but in cultural practice never fully achieve) (cf. Herman 2013, 30).

Based on a cross-cultural study of traditional societies from around the world (Indonesia, Micronesia, New Guinea, Melanesia, Fiji, Samoa, Tahiti, Easter Island, the Americas, Africa and Australia: Herman 2013, 32–33), C. Lévi-Strauss undertook the effort to develop a universal theory of dualistic organisation, within which individuals define themselves in relation to the various manifestations of social life, creating a network of various binary oppositions: cooked versus raw food, marriage versus celibacy, the centre of the village versus its periphery, male versus female, sacred versus secular, etc. These antitheses – presuming a dichotomy between state and process, stability and change, identity and transformation, being and becoming, synchrony and diachrony – serve directly for the conscious or unconscious articulation of dualism by cultural participants (Lévi-Strauss 2021, 160). The dualism need not be absolute, expressing itself in all aspects of social life without exception. Its forms can be arbitrary and relate only fragmentarily to specific aspects of the functioning of a population. Referring back to the period of the turn of the Stone and Bronze Ages in Central and Eastern Europe, as highlighted in this article, dual elements are clearly discernible at the junction of technology, economy, and society.

Instead of a conclusion, the vision of the dichotomy understood as an economic and social trans-regional phenomenon, as well as an inter-technological one in line with the "spirit of the age", certainly still requires numerous confirmations and additions, and thus further studies and inquiries. Undertaking these, with the intention of obtaining sufficient empirical indications for putting forward a strong, non-intuitive, dichotomous synthetic interpretation, is viewed by the author of this paper as an interesting research postulate for the future.

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