BETWEEN INVENTIVENESS AND INTERPRETATION: GROUND STONES

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Key Words: *ground stones • inventiveness • interpretation • archaeology • theory*

Abstract: In Turkey, archaeological research has developed more with the scientific understanding of 'doing excavation' than a concept of 'the adequacy of digging'. Of course, archaeological research should involve excavation, but scientific understanding cannot be limited to this. Excavation is one of the techniques used by the science of archaeology. When we start from this point, excavation work should be as successful at knowing and understanding the past which is the essence of science, creating knowledge of this and sharing this information, using it and making it accessible to everyone as at excavation itself. However much archaeological work is generally understood as the ritual of excavating the soil to find 'new unknowns' (or 'newly rediscovered), and, having restored them, giving them to museums, this situation only makes up an accumulation of material culture and its visuality. Despite the focus on the enrichment of Turkish archaeology since the 1960s with interdisciplinary research and the putting into practice multidisciplinary research, today it is difficult to move on without asking to what extent this has been successful. Archaeology, even if it has been reduced to the scale of excavation today, is a discipline generally evaluated as the system of the scientific practice of excavation operating within the triangle of theory, method, and practice. Today we can observe that it is in a position where the first of these is largely ignored, the second has not yet been seen and the third is taken directly or sometimes piecemeal from the excavation systems developed by German, American or English archaeology. Within this archaeology, based on the third process of the triangle, interpretation, which needs to take place after excavation, is among the most important of the missing components. Based on this general view, this study of ground stone industries, which have long been neglected in the archaeology of this country, is shaped in such a way as to be an example. In this study, which underlines the question of where the stone tools in question are and where they should lie in archaeology between inventiveness and interpretation, an attempt is made to lay the foundation for ground stones in the first corner of the above-mentioned triangle. Also, however much it is claimed that archaeology is a multidisciplinary field, I aim to show that this is not true when looked at from the perspective of ground stones.

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Gönderilme Tarihi: 12.05.2021; Kabul edilme tarihi: 24. 11.2021

YARATICILIK VE YORUM ARASINDA: ÖĞÜTME TAŞLARI

Anahtar Kelimeler: *Öğütme Taşları • Yaratıcılık • Yorum • Arkeoloji • Teori.*

Özet: Türkiye'de arkeolojik araştırmalar daha çok "kazı yapmak" bilimsel anlayış da "kazıyor olmanın yeterliliği" etrafında gelişmektedir. Elbette arkeolojik araştırmalar kazılar yapmalıdır ama bilimsel anlayış bununla sınırlı kalamaz, yetinilemez. Kazı, arkeoloji biliminin uygulamış olduğu yöntemlerden biridir. Bu noktadan hareket edildiğinde, kazı çalışmaları bilimin özü olan geçmişi bilmek, anlamak, bunun bir bilgisini oluşturmak ve bu bilgiyi paylaşılır, kullanılır ve herkese açık hale getirmek konusunda da kazılar kadar başarılı olmalıdır. Arkeolojik çalışmalar genel olarak her ne kadar toprağı kazmak, "yeni bilinmeyenleri" (veya yeniden benzer bilinenleri) ortaya çıkarmak, restorasyonlarını yaparak müzelere vermek ritüeli olarak algılanıyor olsa da bu durum, özünde sadece materyal kültür ve görselliğe dayalı bir birikim oluşturmaktadır. Türkiye'deki arkeoloji 1960'lı yıllardan bu yana disiplinler arası çalışmaların zenginleştirilmesi ve çok disiplinli çalışmaların hayata geçirilmesi üzerine odaklanmış olmasına karşılık bugün ne dereceye kadar başarılı olduğunu sorgulamadan geçmek zordur. Türkiye'de Arkeoloji, günümüzde neredeyse kazı boyutuna indirgenmiştir, doğal ve genel olarak da kazı bilimi olarak değerlendirilmektedir. Aslında arkeoloji kuram, metot ve pratik üçgeni içinde hareket eden bir sistem, bir bilim dalıdır. Günümüzde ilk kısmın dikkate alınmadığı, ikincisinin hala görülmediği ve sadece üçüncüsünün de Alman, Amerikan veya İngiliz arkeolojisinin geliştirdiği sistemlerden, ya doğrudan alınan veya yap-boz şeklinde uyarlanarak kullanılmaya çalışılan bir durumda olduğu görülmektedir. Daha çok, üçüncü süreçten yola çıkılan arkeolojide ise yorum, kazı sonrası yapılması gereken, eksik kalan en önemli şeyler arasında yer almaktadır. "*Post-ex*" kavramının bilinmediği ve bilimsel analizlere yönelik çalışmaların neredeyse yok denecek kadar az olan genel görüntüden hareket ederek, genel bir tespit olabilmesi adına şekillendirilen bu çalışma da yine ülkemiz arkeolojisinde uzunca bir süre dikkate alınmamış olan öğütme taşları alet endüstrisi üzerinedir. Söz konusu taş aletlerin arkeoloji içinde yaratıcılık ve yorum arasında nerede olması gerektiği kadar nerede olduğunun altını çizecek olan bu çalışma, yukarıda belirtilen üçgenin de ilk ayağı, yani teori için zemini en azından öğütme taşları özelinde dahi oluşturulabileceğine yönelik bir denemedir. Ek olarak, arkeolojinin her ne kadar çoklu disiplin (*multidisciplinary*) olarak çalıştığı iddia edilse de öğütme taşları perspektifinden bakıldığında, Türkiye özelinde bunun doğru olmadığını da göstermeyi hedeflemektedir.

Introduction

Because of its geopolitical position, Turkey is one of the most intense areas of cultural mobility throughout the ages. In short, nearly all those scholars, particularly those whose research focuses on Anatolia have accepted it as a cradle of civilization. Without going into the history of Turkish archaeology, when developments are briefly inspected, we can see that the 1950s and 1960s had an important role in the progress of archaeology in Turkey just as in the case of Europe and the USA. The archaeological studies and research carried out in these years are the indication of the start of a different period in Turkish archaeology[1]. During this period, we can see that archaeological research gained additional dimensions not only in archaeological discoveries but also in archaeological research and working methods, new perspectives and emerging paths. One of the new perspectives, which became particularly clear after the research carried out by Çambel in conjunction with the Braidwoods of Chicago University, was taken as the basis of the progress of Turkish archaeology within the framework of the interdisciplinary research model[2]. It became more oriented towards scientific approaches and more aware of specialist focus and studies in archaeology. It was partially the influence of new debates revolving around the "new archaeology" of Binford and his friends and the Braidwoods' specific way of practising archaeological research with their team. The interdisciplinary foundation of research can be explained more precisely and clearly with the following words of R.J. Braidwood:

"We archaeologists shall have to depend much more than we ever have on the natural scientists who can help us. I can tell you this from experience. I had the great good fortune to have on my expedition staff in Iraq in 1954–55, a geologist, a botanist, and a zoologist. Their studies added whole new bands of colour to my spectrum of thinking about how and why the revolution took place and how the village-farming community began. But it was only a beginning; as I said earlier, we are just now learning to ask the proper questions."[3].

Without a doubt, Braidwood's thoughts were very important both for that time and in the development and formation of archaeological knowledge. Meanwhile, today, it is standard practice for zoo-archaeologists, geo-archaeologists, and archaeo-botanists, experts in more than one field, to take their place within archaeological projects. Despite these early influences in Turkish archaeology, the current number of specialists being raised is so small as to be almost non-existent. If opportunities and support are not provided for accomplishing further training for those who intend to become archaeologists in the future, archaeological research projects in Turkey will remain in the same place rather than being competitive with contemporaries elsewhere and with no further scientific develop-

[1] Arsebük 1983.
[2] Çambel – Braidwood 1980.
[3] Braidwood 2016 (ebook excerpt).

ment. Although these lines seem very negative, they must be registered for planning the future of archaeology in Turkey and providing motivation in many other research areas such as the C14 labs and genetic research programmes that have been established in the last decade.

Undoubtedly the 1960s were stormy years in the archaeology world. During this period the emergence and development of the theoretical approach to archaeology known as "New Archaeology" under the supervision of L. Binford[4] had a major influence[5]. It should be noted that for this period, the interdisciplinary model and positivist approach of the "New Archaeology" movement primarily envisaged the contribution of experts to archaeological studies, the introduction of science-based research and the emergence of new interpretations and perspectives depending on their areas of expertise[6]. The first striking step of this model in Turkish archaeology was the remarkable studies of Kantman and Dinçol[7]. Although the need to train and increase the number of specialists is noticeable in the interdisciplinary working model, the process of putting it into practice remained rather slow. When looking back from the point reached today, it is possible to see that in some cases the interdisciplinary model has hardly been put into practice. Even today, when it comes to expertise in archaeology, it would not be wrong to say that studies on stone, ceramics, and architecture are the first to come to mind[8]. However, today an expert should not be limited to understanding and knowing only their study area but must correlate also with science and information technology.

What has been the progress and what has been gained in the intervening period of sixty years since the 1960s? We can observe that hundreds or even thousands of artefacts recovered by continuing or newly started archaeological research projects remain without having been fully studied. Does this situation result from too many artefacts being recovered, or from the lack of sufficient specialists? Here it is worth noting another point, which is that all research subjects fall within the three main stages (theory, method, and practice) designated above. Despite the introduction of the interdisciplinary model, the fact that in practice it was not evaluated sufficiently and in earnest caused there to be insufficient experts trained in the necessary fields of expertise. This deficiency can be seen at the beginning of a process that led to the establishment of an archaeometry unit by Prof. U. Esin, Prof. H. Özbal and other colleagues from METU in 1979. It is a pity that the number of archaeologists trained and specialized in various fields of archaeology today is very low. This shows that the need to align archaeology with scientific requirements has still not been realised. The archaeology departments in most European countries are investing in setting up various laboratories including isotope, plants, charcoal and use-wear analyses. In

[4] Binford 1962, 1964, 1965.
[5] Lerner 1994.
[6] Brothwell – Higgs 1963.
[7] Dinçol – Kantman 1968; Kantman – Dinçol 1969.
[8] Baysal 2016.

contrast, we are still lagging behind resulting in a major impact on the progressive advancement of archaeology in Turkey. Today, comprehensive laboratories where scientific analyses can be performed have not been fully implemented, even within large and capable universities. Many reasons can be shown for this situation, but discussing the reasons here goes beyond the scope of this paper. In the remainder of this paper, I would like to move on to look step by step at ground stone studies and how they may relate to some of the issues mentioned above.

This paper has emerged from the awareness of an interdisciplinary approach that can be defined as a creative idea, through which many experts could have been trained in Turkish archaeology where today very few archaeologists have specialized in a specific area of research and the number in each field of expertise is still very limited. This study focuses on one of the areas in which there are not many specialists – 'ground stones'. Within this focus, the historical position of ground stone tool technology between creativity and interpretation will be reviewed and evaluated. The approach will reveal the reasons for the lack of expertise, and I hope that it will contribute to the understanding of the shortage that is observed in some fields of specialization and will encourage young colleagues who are currently, or who will in the future, carry out their studies to specialize in the areas of which Turkish archaeology is desperately in need. The rapid changes and advancements in archaeology demand such specialists who can also combine and cooperate their work with other areas of interest in archaeology, anthropology, and similar areas.

The Case of Ground Stones

The common denominator of the tools that we try to define with the term ground stones[9], in a broader sense, is that they are made of stone. But of course, this term does not include all tools made of stone. The main group of finds produced from stone raw materials that are not included in this definition is "Chipped Stone Tools". The small number of researchers who have studied and are doing work on ground stones in Turkey tend to describe the tools in this group as "Grinding Tools"[10]. At this point, when both the production technologies and usage processes are taken into consideration, this definition points to a lesser number of finds and eliminates the flexibility seen in usage practice among these artefacts. If asked to give an example of artefacts that are encompassed by the work of many researchers specializing in ground stones, the hammerstone, utilised in the production of chipped stone, would be extremely difficult to define under this definition of ground stones. The hammer stone can be thought of as any pebble gaining functionality - any stone found in nature can be turned into a tool without any working. Therefore, the term "grinding stone"[11] refers to the limitations of human creativity

[9] Baysal 2001, 2005, 2010, 2015, 2019a and 2019b.
[10] In the sense of rubbing, tools that have been utilised by rubbing in Turkish terminology.
[11] Grinding Stones term is used for the term "Sürtme Taşları" which means "rubbing stones" in english.

rather than to its breadth. It is also worth noting that we should not expect humans to exhibit the same set of standard behaviours in every situation. People behave in unpredictable ways because they are thinking creatures with individuality and solve problems according to sets of unique circumstances.

When the Neolithic is defined as the domestication of animals and plants by settled humans, the process is discussed as a romanticized, narrative system of history. In general, research on the period saw the Neolithic as a revolution and interpreted the process as a diffusionist, dynamic cultural process in which material cultural elements stand out[12]. In other words, a general understanding and interpretation have been made by highlighting the developments and changes at the point reached by humans at that time. This is followed by discussions of how and where people in this period started the process and created the forerunners of Neolithisation[13]. Subsequently, we learn from archaeo-zoologists and archaeo-botanists what kind of processes the animals and plants, which are regarded as the subjects of the process, went through, and even the stage of domestication today, as well as many more details. While all these stages were taking place, ground stones took their place in the toolbox as one of humanity's indispensable tools during, and even before, this adventure. Ground stones during this crucial period were hardly considered in Near Eastern archaeology until the work of Kraybill in the 1970s[14]. In other words, it was not seen as a tool group that could be a field of expertise in which research could be carried out. Of course, setting up analogies in ceramic types or chipped stone tool types and via those getting a sense of dating were primary tools for archaeologists. However, the discovery of ground stones in archaeological contexts was considered a sign of whether the people who lived in the settlements where the excavations were carried out engaged in agriculture and did not extend beyond this extremely simplistic interpretation. If they were found, they were nothing more than "signs", inferences not going beyond the interpretation that in settlements where they were found people knew agriculture, and conversely if not found they did not engage in agriculture[15].

Ground stones also contributed to chronological understanding. The presence of these assemblages helped to define the era in the widest sense as Neolithic[16] or in sociological perspective define agricultural communities or societies. Apart from the basic fact of agriculture being known, it is possible to describe the periods during which inferences can be made related to the existence of these stones. Considering the simplistic interpretive exploitation of ground stones' presence in archaeological contexts, when we look back, these can be interpreted as the dark years of the archaeology of ground stones. As the domestication of animals and plants was the prerequisite of the Neolithic way of life, chipped stone

[12] Childe 1958.
[13] Braidwood 1995; Braidwood – Howe 1960.
[14] Kraybill 1977.
[15] Childe 1969, 35.
[16] Childe 1943,19; Curwen 1937, 1941.

tools also gained great importance, due to their employment as harvesting tools, in the understanding of such communities and the agriculturalist way of life. Meanwhile, ground stone artefacts discovered in related archaeological contexts, despite being utilised in the processing of plant foods, remained in the background.

Potential and progress

The potential of ground stone artefacts as a source of archaeological knowledge was recognized very late in the 1970s in southwest Asia[17]. Again, apart from a few studies carried out on ground stones in Turkey in the 1980s, systematic studies of ground stone artefacts had not significantly advanced by the beginning of the 1990s. While research on theoretical approaches and material culture was developing rapidly, the number of studies on the Neolithic was growing by the day, and specialization on chipped stone tools was extremely popular, ground stones, important tools in the Neolithization process, still did not attract attention as a field of expertise. How could these large, heavy, and prolific tools escape notice? Until the 1990s, archaeologists hardly encountered the subject of large ground stone assemblages and in conjunction with these assemblages of the evidence for the consumption of plants which stood in plain sight, instead of focusing in detail on the issue of how the chipped stone tools were found and used to cut non-domesticated or cultivated plants. Although there have been intensive studies on ground stones around the world in the last twenty years, ground stones are one of the artefacts that have come to the present day without yet being investigated in all their aspects or at full capacity. Ground stone artefacts gradually began to appear in excavation reports as one or two-line summaries in Turkish archaeology when we entered the new millennium[18]. Although this was major progress, when compared with pottery, chipped stone tools, or architectural elements still little detailed information was given about these assemblages. The universal undervaluation of these assemblages by the "nothing will come of these stones" approach has probably resulted in the lack of competent experts to work on ground stones. We can see that this sticking point is one of the consequences of not concentrating on the above-mentioned theoretical and methodological models of thought.

In Anglo-American archaeology, the 1960s and the 1980s are accepted as turning points in archaeological theory. While in the 1960s Binford and New (Processual) Archaeology had a wide effect, in the 1980s Post-processual Archaeology, which appeared as a counter to New Archaeology under Hodder's leadership, produced new enlightenment, and many creative thoughts. Hodder's thoughts quickly found fans and followers. In his studies, which form the foundation of his theoretical approach, Hodder[19] emphasizes the need for interpretation of material culture and an understanding of the contexts in which it exists, including the relationships between those contexts.

[17] Kraybill 1977.
[18] Esin 2000, 75; Özbaşaran 2000, 85.
[19] Hodder 1995

Contextual archaeology, while interpreting the archaeological contexts of the finds, aims to interpret the past, based on these principles, while evaluating many artefacts by associating them with each other. Even though ground stones were found in crucial locations such as burials, and near ovens and hearths, they could not get rid of their initial label as a "sign of agriculture" until two decades ago. Despite the widely debated theoretical frameworks and rapid change in theoretical geographies and scientific approaches in archaeology, the first studies of ground stones assemblages having appeared in the 1930s[20] and the foundation of a solid academic basis of ground stones studies at the beginning of the 1990s[21], in Anglo-American modern research programmes the progress of ground stone assemblages in archaeology shows a similar universal pattern.

Since the 1960s and 1980s, with the acceleration of theoretical approaches, a period in which a wide variety of creative thoughts came into being, particularly emphasised the need for scientific approaches[22]. Since then, the science of archaeology has fitted into interdisciplinary approaches and, raising experts in these areas, strengthened its interdisciplinary relations. Corresponding to these archaeological developments along well-defined lines, it is of course possible to investigate the reasons why ground stones did not come onto the agenda until two decades ago in both Anglo-American and Turkish archaeology. In a recent evaluation[23] in Turkish archaeology, apart from training experts in the field of ground stone research, which shows the numbers of theses about ground stones in the academic environment, when compared with those on subjects such as pottery/ceramics, architecture, etc., can be counted on the fingers of one hand. This might be defended with the claim that pottery comes out of every excavation, and architecture is ubiquitous, but when we consider that the ground stone tools, whose main purpose is perceived as food production, are everywhere where people are, and when we consider that they were used extensively from the Upper Palaeolithic until almost the present day in Turkey this defence fails miserably. If we ask why the research conducted on the ground stone assemblages has been so limited, the answers will undoubtedly contribute to the historical development and understanding of archaeology in its broader sense. The fact that the ground stones have been brought into the agenda with the few theses[24] in Turkish archaeology in the last twenty years should be regarded as a considerable development.

Vulnerabilities, avoidance, and danger

Although interest in the subject has been gradually increasing, terminological issues have started to appear in studies of ground stones. If this issue is not confronted at an early stage this may turn into an established long-term problem. The

[20] Curwen 1937, 1941.
[21] Adams 1988, 1989a, 1993a, 1993b, 1994; Wright 1992a, 1992b, 1993, 1994.
[22] Brothwell – Higgs 1963.
[23] Baysal 2016.
[24] Atalay 2009; Ayhan 1999; Bamyacı 2017; Baykal 1980; Baysal 2010; Güldoğan 2002; Sırlan 2019; Türkmen 2009.

apparent issues currently stem mainly from not being able to conceptualise ground stones as a lithic industry. The main inclination in understanding ground stones is limited to querns, hand stones, mortars, and pestles. However, in their broadest definition ground stones cover lithic use apart from chipped or knapped stone industries. Can terminology be such a big problem? Since this is a separate topic of discussion, I will not go into it in detail here. However, the necessity for the formation of universal unity in terminology will help to form an interrelated structure, understanding, and enable fluid communication of information. Therefore, it is important to create a common understanding and accepted terminology as soon as possible amongst colleagues in Turkish archaeology. Researchers who will be engaged in the ground stone study can benefit from this early organisation and they can easily expand their research, the subject area, and methodologies. Another good reason for this approach is that ground stone assemblages have rich variety, numerous subcategories, and diversity and all these complex entities are waiting to be explored and contribute to our archaeological knowledge from their perspectives. The newness of the research area is motivational and an encouraging case for researchers never mind the depth of the paths that are waiting to be explored.

Besides terminological issues, the framing of ground stones as the limited number of big and bulky stone tools consisting only of the upper and lower parts of grinding equipment and mortars and pestles and maybe a few exotic types will be a hindrance to the ground stones research area. In these early stages, well-documented typologies are going to be a great help. The typologies also should not only be site based or geometrical definitions[25] i.e. round, ellipse, circular, ovoid. Although a classification system was suggested by Wright[26] in the past, the current understanding of the ground stone industry should be reconsidered and readjusted. Ground stone assemblages comprise multiple tool types with multiple functionalities and long-term usage, where repair works, or reproduction takes place in their secondary usage and/or long use-life[27]. This results in different criteria for typologies or classification systems and, rather than, as Wright suggested[28], techno-typological classification, which is adopted from knapped stone technology, should be more focused, targeting the assemblage itself and considering the fluid techno-functionality of these tools.

As a new research area in Turkey ground stone studies can attract young scholars to explore these assemblages, however, currently, some of the embedded lack of knowledge and understanding in this subject at the supervisory levels indicates potential dangers for the immediate future of this research topic, although perhaps not in the long term.

A short history of ground stone studies in Turkey

The historical development of the study of the ground stone tool industry in

[25] Davis 1982.
[26] Wright 1992a.
[27] Baysal 2010; Tsoraki 2007.
[28] Wright 1992a.

Turkish archaeology is important in understanding the current state of play. The insistence on the use of "Sürtme Taşlar"[29] can mislead us into a debate about whether these tools were used or produced in such ways in terms of Turkish meaning. Of course, naming the assemblage may not superficially be very important, but when it comes to what this term covers regarding production and use technology and tool typologies the field becomes very limited. The studies that have been established, and that will contribute to the production of archaeological knowledge, are not yet enough to have become traditionalised in approach. Of course, even when consensus cannot be reached, it is always possible to expand the research frontiers of the ground stone industry. However, when looking at the chipped stone tool industry, the terminology used is stable and accepted. The terms "blade", "chip", "microlith" or "bifacial" mean something. Essentially, these are all well-defined parts that have been removed from a piece of raw material by various techniques[30]. Accordingly, we cannot call all of them "broken-edged ones"or "broken ones" which would be equivalent to the current terminological approach to ground stones. The repeated creation of terminological language and its arbitrary use should be abandoned to progress onto the healthier ground in the stone tools' history. However, often our colleagues prefer using this terminology as a kind of inherited cultural heritage. Nevertheless, unity in terms will make cooperative and comparative works easier.

Towards a healthier approach, below the historical process of ground stones studies in Turkey, will be outlined very briefly. In the early 1980s, the first engagement took place with ground stone studies. Hersh[31] had already begun her doctoral research before the 1980s based on the ground stone assemblages of Erbaba, exploring manufacturing and usage. Hersh also compared the production and use of these tools to ethnographical examples both in Turkey and Greece. Her work made the map for ground stone studies, but the input from Hersh's comprehensive work was hardly acknowledged in follow-up studies in archaeology. The following, important works released in the early 1980s are Baykal's thesis and Davis's report on ground stone objects from Çayönü (Diyarbakır/Turkey). Baykal and Davis also contributed to the Çayönü project during this period. These constitute the leading works in Anatolian archaeology to which there was little follow up until the second part of the Çatalhöyük excavations started by Ian Hodder in the 1990s. The Çatalhöyük project's wide-ranging and far-reaching approach to material evidence and its analysis also established a specific research unit within the project called "ground stones studies" in 1995. The first very basic report appeared in 1998, based on the geological surveys around Çatalhöyük to identify possible raw material sources of ground stones[32]. In the meantime, the preliminary registration system had been set up and the first preliminary report on the contextual dis-

[29] Translates to English as "grinding or rubbing stones"
[30] Guilbeau and Perles 2019.
[31] Hersh 1981.
[32] Baysal 1998.

tribution of ground stones was also produced[33] at the Aşıklı Höyük excavation conducted at the time by Prof. U. Esin.

At the end of the 1990s, Ayhan[34] completed his thesis based on the assemblages of the site of Tepecik, which was the second work from the Prehistory Department of İstanbul University after Baykal's thesis, in approximately eighteen years. Takaoğlu[35] also completed his work in 2000 on the marble workshop at Kulaksızlar. Takaoğlu's work was a big contribution to ground stone studies in Turkey particularly because it engaged with artefact production and workshop area. The third thesis from İstanbul University was based on the Aşıklı Höyük ground stones by Güldoğan[36] in 2002. Güldoğan's work framed the Aşıklı Höyük ground stone assemblages, benefitting from previous work and available literature on ground stone and remains as the main study of the Aşıklı Höyük assemblages[37]. In the last decade or two increasingly more work by Turkish scholars has appeared in the literature.

Since 1998 the start of secondary engagement in ground stones assemblages in Turkish archaeology and the gradual increase in the number of reports, small articles in various Turkish journals, thesis and book chapters have continued the progressive development of ground stone studies in Turkish archaeology. Today the ground stones literature contains a vast number of publications. It is firmly established as a research area in the world of archaeology and is still progressing in Turkey and finding its feet. Ground stone tools and technologies have been taught in university courses as part of lithics or material studies classes[38]. However, ground stone studies became a newly added complete course in both Turkish and English teaching programmes in the Archaeology Department of Ankara University. This current progress indicates that ground stone studies are a well-recognized research topic and specialism in Turkish archaeology.

Inventiveness and creativity for ground stones: are we there yet?

There is a large gap in understanding the production, use and re-use of creative processes of tools, especially within the ground stone tool industry. The technology of ground stone tool industries and understanding food production can also be explained using *chaîne opératoire*. However, this is a very mechanical way to convert the production process into understandable terms. It may have been a revolutionary approach to tool production or any production-related activities, however, understanding the stages of how things are produced limits our knowledge about the mind that structures all these processes[39]. It can be argued that since an apprentice learns how to produce a spe-

[33] Baysal 1998b unpublished report in Aşıklı Höyük Archive (Aşıklı Höyük Öğütme Taşları Üzerine Kısa Notlar).
[34] Ayhan 1999.
[35] Takaoğlu 2000.
[36] Güldoğan 2002.
[37] Güldoğan 2003.
[38] Özdoğan 2019, 15-17.
[39] Boden 1998.

cific object, then following the same routine will lead to the same result every time. This leaves a major gap in understanding the inventiveness of the mind[40]. It is important in any production process to understand inventiveness and creativity as a whole process rather than the structured practical side of the production[41]. This is also true for ground stones tools.

The gap that *chaîne opèratoire* creates in understanding creative technologies and their invention needs to be removed, not only for ground stone experts but also for those focusing on any material studies and conducting excavation and research projects. This will expand our knowledge and interpretation of prehistoric communities and how they were invented and produced rather than only how they used their skills to transform raw materials into functional tools or objects. Production not only consists of raw material and a set of skills - creation takes place in two areas; firstly, in visualising and designing, which we may call thought process and secondly the execution of all these ideas. One part requires the mind and the other physical part hands eye coordination as well as ideas.

First, let us look at what kind of situation ground stones are in (or not) in the creativity phase and where they are (or should be) in the interpretation phase. Like many other products of humankind, ground stone artefacts are also a result of human creativity, the product of the mind. In the remainder of the article, I would like to investigate the issue of creativity and following that, how our interpretive approaches in archaeology, in most cases in material studies, exclude the mind part of artefact studies. In short, as ground stone tools are accepted as a contributor to the construction of the archaeological past, technology and dietary habits, the creativity encompassed in these tools, both as an artefact or contextually including anything on or with them[42] must be considered and understood.

Creativity

The subject of creativity was briefly mentioned above. Extensive studies have been conducted about creativity from the perspectives of art, psychology, neurology and philosophy as well as archaeology[43]. Indeed, material culture is the remaining items from the past evidencing people shaped, structured, and defined world. All these objects were designed, shaped, and used for specific activities, whether for symbolic or physical purposes. These objects are usually categorised as elements of technology or culture.

These objects were transferred from their natural state to another form, whether aesthetic or functional. Intellectual capability is a characteristic of humans and resulted in structuring life around the material world. In this demanding fluid and continuous relationship between the material world and humans, archaeology must focus on understanding how it operated in each past community[44].

[40] Renfrew – Zubrow 1994.
[41] Mithen – Parsons 2008.
[42] Baysal 2020.
[43] Carruthers 2002, 2006; Hodder 1998; Mithen 1998b.
[44] Malafouris et al. 2014.

Recent papers that appeared in Turkish literature on creativity question tool production and whether it is only a learned activity or the result of a thought process[45]. Even if the design was purposed for a specific activity, alterations to this purpose can be made thereby changing the original idea[46]. There can easily be found many objects in prehistory interpreted by archaeologists as for a specific action or function, which may also mislead our conceptualization of these items and limit our interpretation of past technologies and people.

The early production of stone tools was based on hard stones such as flint, chert and obsidian. Despite the hardness of the stones, the creativity of the human mind yielded forms such as hand axes, blades, scrapers and so on. This indicates hand-eye coordination, progressive planned thinking, and finally visualisation[47].

The production, technology, flexibility[48], multifunctionality[49], convertibility and ease of utilisation of ground stones[50] has often been stated in scholarly works. There was a person behind each of the actions that resulted in these tools and that person carried the knowledge about actions, materials, place and time that allowed them to carry out the procedures. This knowledge was accumulated and increased through time as it was passed between generations and shared and stored in individual and social group memories[51]. One of the most valuable pieces of knowledge mainly revolves around, survival, was the tool-making skills. One can postulate that human creativity is primarily engaged in its existence.

The creative nature of the human being possibly developed from the point of hitting and breaking foodstuffs with stones and/or any other hard material to the next step which was cutting with sharp-edged tools. These two stages enriched the tool repertoire from biface tools to axes and finely produced blades. The following stages engaged technologically in the grinding motion for both toolmaking and the foodstuffs themselves. However, the evaluation of ground stones from the perspective of creativity is not just yet explored to its full capacity and understood yet. The ground stones assemblages consist of a variety of tool types many of which may have been acquired and utilised in their natural form[52].

Most ground stone specialists usually follow the existing classification system available to them[53]. Although Wright adopted the knapped stone typology system for the ground stones and succeeded to a certain degree with a techno-typological approach. Ground stones tools can also be categorised by their function, their use wear and shape. In most cases, the rejuvenation, reworking due to breaks or malfunctioning of the tool may be designed to function in more than one style. Considering this, it is safe to suggest that

45 Baysal 2017 and 2018.
46 Baysal 2017.
47 Carey 2000.
48 Adams 2002; Stroulia 2010; Wright 1992b.
49 Baysal – Wright 2005.
50 Adams 1989b.
51 Connerton 1989.
52 Baysal 2010.
53 Wright 1992a.

firstly the ground stone classification system needs further development. Since the production of ground stones combines both flaking and grinding methodologies it involves a different level of creativity and conceptualization than stone knapping, and these tools are more suited to being evaluated from the perspective of a techno-functional framework[54]. Production and use of the tools may closely relate to raw material accessibility, there are also cognitive correlations and social dimensions to these tools being kept and re-used and re-shaped.

Tool production involves creative thinking but use and repair work or even conversion of use involves skills, sociality and even pressure of accessibility to raw material. This coincides with the third evolutionary stage of hominins where it is emphasised that cognitive progress[55] and a domestic structure related to the new scenery of the domestication of plants and animals[56].

Interpretation

Archaeology is searching for the past by collecting and interpreting the evidence of past people and their actions. These shreds of evidence consist of material culture manufactured by human beings. Post-processual archaeology is concerned with power, ideology, agency, and similar issues[57] and such topics lead to interpretive archaeology. Interpretive archaeology has been a rescue operation[58] of post-processual archaeology against the critics saying it lacked methodologies[59] a problem acknowledged by post-processualist archaeologists[60]. As Hodder emphasised[61] the necessity for interpretation is high and post-processualism was lacking engagement with data, however material and data engagement had always been open to post-processualists.

Interpretive archaeology finds its strength within the contextual analysis. Although interpretation is closely related to excavation strategies and to the material culture which also directly or indirectly has an impact on our interpretation, this can turn into an interpretation of an interpretation[62]. Interpretation is fundamental to archaeological research and there are many studies in many different areas in the archaeological literature[63]. Interpretive archaeology was founded by British archaeologists and anthropologists such as Hodder, Shanks, and Tilley. Hodder[64] explains the purpose of interpretive archaeology and the point of view that we will accept as its manifesto, in a very simple statement. According to Hodder,[65] it consists of trying to understand the dilemma or dialectic of archaeological knowledge in subjective and objective terms, without rejecting scientific research and contributions to archaeology, but rejecting a rigid

[54] Baysal 2010.
[55] Renfrew 2001.
[56] Coward – Gamble 2008; Cauvin 2000; Renfrew 2001a – Watkins 2004.
[57] Hodder 1991, 8.
[58] Hodder 1991, 10.
[59] Earle et al. 1987; Kohl 1993; Watson 1986 and 2008.
[60] Hodder 1991, 8.
[61] Hodder 1991, 10.
[62] Hodder 1991, 12.
[63] Buchli 2000; Hodder 1991; Marciniak 1999; Thomas 2000; Tilley 1993; 2000.
[64] Hodder 1987.
[65] Hodder 1987, 517.

positivist understanding[66]. In this context, interpretive archaeology states that even within its manifesto, there can be very different interpretations, at least in a subjective and objective sense. However, it should be noted that archaeology tries to understand and interpret the worlds of people who lived in the past and we have never known their world or experienced it in person.

Although it has been suggested that we should try to understand subjectivity and objectivity by today's standards, it is obvious that there is not enough data to understand the relations of people who lived in the past and the world that they have successfully structured. The integrity of their world was the result of their thinking system which no doubt shaped their material world to a certain extent and within their contexts. A mental process is a subject to be interpreted through its perception of the outer world and re-expression via material culture within the norms and rules of social, economic, and technological ecologies. We can interpret the system that has been structured by the past communities however, even if we can successfully achieve this, there will be a major distance between this knowledge and lived experience in the past. Hodder[67] proposed that until closed the hermeneutic circle in our interpretations may slide away from reality. Or even that hasty interpretive conclusions may result in a domino effect in the construction of our understanding of the past.

In the early literature on ground stone assemblages Tylor remarked on Tasmanian ground stones, drawing comparisons, assumptions, inferences and arriving at his interpretation which is, "..*Tasmanians were undoubtedly at a low palaeolithic stage, inferior to that of the Drift and Cave men of Europe*"[68]. This was of importance for his time, especially given that this relates to the ground stone industry. However, Tylor was interpreting the artefacts in a standard fashion as is done today. He followed an "interpretive approach" which is no different than that advised - working with data and material culture and finally interpreting to maximise the knowledge of the artefact or via the artefact, what it stands for. The interpretive approach is not a new way of understanding things for the inquisitive mind. Rather, every inquiring mind can arrive at the same solution especially if the issue is material culture. Another case, relating to an interpretive approach to ground stones is that of forest clearance by stone axes and/or fire.[69]. Clark interprets agricultural expansion during the Neolithic in Europe by clearance of the trees and to do so the use of polished stone axes combined with fire. Indeed, Clark's view was right, the Neolithic agricultural activities had an impact on forest clearance, and this coincides with the growing agricultural activities in the UK and Europe. Forest clearance has been a subject of substantial debate and still, research is conducted into this subject[70]. Roberts and colleagues explore pollen analysis to understand what happened

[66] Hodder's reply, see Earle et al 1987.
[67] Hodder 1991.
[68] Tylor 1895
[69] Clark 1947, 49; Iversen 1956.
[70] Roberts at al. 2018.

and keep an open mind about the possible use of fire, tools, and even climatological changes. Roberts et al. conclude that agricultural activities had a significant impact on the landscape[71]. The examples given here are spaced roughly 50-60 years apart from each other showing that interpretation is a major part of knowledge production.

However, ground stones assemblages did not much benefit from such inquiry, inferences, and interpretation. Tylor's approach to ground stone assemblages slightly changed around the 1940s and within this change, ground stone assemblages were given a new role as a signifier of the presence and absence of agricultural activities. This was based on assumptions and this perspective also had an impact on ground stone studies. The historical interpretive approaches carried on regardless of archaeological trends or theories. As mentioned above, as post-processual archaeology was lagging due to a lack of concrete methodologies, interpretive archaeology came to its aid, but material culture engagement led in rather a different direction than inclusively engaging with ground stone assemblages, which waited until the beginning of the 1990s.

Knapped and Ground Stones

Chipped stone tools have been one the most important source of information about human technology, considering their past of approximately 3 million years, this is perhaps self-explanatory. This represents a long-term human engagement to understand the properties of stone raw materials, produce, use, and adapt lifeways and then perfect them. The convenience of the knapped tools and their technology offered many opportunities and advancements including hunting and carpentry which were both important for the chosen economic models. The knowledge of production and the use of knapped stone technology opened doors for future adventures. As a result, knapped stone technology is extremely valuable to archaeologists, and this potential has been exploited by lithic specialists to learn about and understand both the technology and the person behind it. Specialists have researched source analysis since the early 1960s[72], as well as use wear, residue analysis and experimental analysis among others.

Due to ecological and dietary systems knapped stone technology forked, around the upper Palaeolithic, into the different stone industries we know today. The introduction of these tools and the methods of utilising and producing them gave way to integrating a wider range of food items into the diet. This not only increased variety, but also the consumption of many new food items. This new stone tool technology probably constituted the first steps into the diversion of the economic models from hunter-gatherer to agricultural activities. According to this progression, ground stones are a continuum from knapped stones, and excellent evidence of the progressive evolution of lithic technology as well as an indication

[71] Roberts et al. 2018.

[72] Cann – Renfrew 1964; Renfrew et al. 1965; Carter – Shackley 2007; Nazaroff et al 2013.

of technological and economic adaptation in the past.

Although there is a clear link between ground stone technology and knapped stone technology, the former has been avoided by most lithic specialists and archaeologists. This may have been due to a lack of knowledge about their purpose. However, gradual interest in the assemblages of ground stones, looking into their roots in an attempt to establish a classification system[73] took place in Near Eastern archaeology in the early 1990s. Wright's radical approach was the first step to putting these assemblages onto the map of lithic artefacts. She adopted knapped stone typological/technological approaches and adjusted them for the ground stone industry. Wright's early attempts were successful in the sense of laying the path for the research area and three decades later has been converted into a united approach in lithic studies[74].

Typological studies of ground stones generally revolve around Wright's primary classification system. However, Wright's classification system must be revised in the light of new studies, especially by attention to the multiple usabilities and long use life histories of these tools. The ground stone study, in parallel to knapped stones, is developing in several areas, such as raw material investigations, use-wear analysis, residue analysis and experimental work. Analytical methods rely on detailed excavation methodologies. In most excavations, the debitage of ground stone tools still is not recognised and collected unless the fragments are recovered from flotation. It should be emphasised that ground stones tools, like any other tools, require maintenance, and even if the tools are not produced on-site, at least this part of the activity is traceable on-site.

Excavations have revealed the ground stone artefacts in various contexts starting with food production areas, usually close to ovens, but also roofs, burials, within wall construction, and underneath oven bases as fragments. All these associations are important to construct our knowledge of prehistoric communities, from varied perspectives.

Discussion

Ground stones were long ago added into the corpus of archaeological material culture, and they played an important role in human life, particularly structuring dietary, and culinary habits. Although these tools can be shaped and produced to specific and best-functioning form, some examples show us that there was no attempt to make a tool, instead expediently utilizing the raw material, fitting it to the purpose. In either case, the *chaîne opératoire* and/or mode of use is traceable from these tools. These assemblages are also valuable to us for the analyses that are possible, allowing us to fully extract further information to construct our knowledge about the past. In this sense, the stones act almost like data storage units. In the current archaeological academic environment, ground stone studies are progressing in line with other areas of material culture in a positive way.

[73] Wright 1992a and 1992b.

[74] Baysal (forthcoming).

Although it is very interesting to consider ground stones under the two broad topics in this study, technologically, in terms of both production and use and as an assemblage of various artefacts, these tools are not currently being left behind from other archaeological finds despite the considerable delay. Ground stones have great potential in the formation of archaeological knowledge. By pointing out the late development of interest in them I have underlined that the work to be carried out in future should be systematic and within an established terminological framework.

Evaluating a research topic, which is only just trying to stand on its own feet, from the perspectives of interpretation and creativity, is a limiting and difficult task. However, it was important to be able to show that ground stones are ready to be researched in the same way as other archaeological finds. While creativity is a major research topic in archaeology[75] as in other fields such as psychology and philosophy, interpretation is also one of the most discussed issues within the framework of theoretical archaeology since the 1980s[76]. Evaluating ground stones between these two giant topics is not easy and I have tried at least to give a perspective on the subject, despite all its limitations, and to show that ground stones also fit into theoretical frameworks.

This paper mostly focused on two points - the first contribution is to understand the need to evaluate the ground stones by considering the development and maturation of archaeological scientific knowledge. Previous approaches have resulted in divorcing ground stones from other archaeological finds. The second is the importance of evaluating archaeological finds within the framework of theoretical approaches from all branches of science if necessary, including psychology and philosophy, to understand the humans behind the object, rather than limiting our knowledge to typological classification. It is very important to be aware that the archaeological modus operandi consists of theory, method, and practice. The archaeologist does not have the luxury to separate or ignore some archaeological finds, due to the relationality of things.

Since the 1960s, theoretical perspectives and approaches have had growing coverage and ever-increasing popularity in archaeology. Most of the time theoretical archaeology adopted a way of thinking for archaeology from other disciplines, particularly philosophy. Just as Bintliff[77] evaluated and questioned the gains from theoretical archaeology which has occupied so much time in archaeological history, it is time to ask ourselves what the gain for ground stones study has been? Interpretive approaches acknowledged ground stones as a signifier of the presence of agriculture or not at all, and creative approaches did not even consider them within the periphery of creativity while questioning most other types of artefacts even in a general fashion.

[75] Mithen 1998a.
[76] Thomas 2000.
[77] Bintliff 2011.

Theories, methods and practices are developing from inside of the research of ground stones, and the research questions also follow these new questions, even in the experimental context. So, there is no need to feel intellectually limited or inadequate in terms of extracting information from these artefacts even if not aware of current trends in theoretical debates, by using science, experiments, and allegorical methods the focus should be on the burning questions that occupy the centre of research until they have been answered. In this sense, the scientific analysis will allow a better understanding of the production, use, nutrition, health and thought systems, social organization as well as the types of tools used by the human communities in the past. As an ideopraxist, it may be better to slowly research ground stones rather than fitting ground stone research into the existing theoretical approaches[78].

[78] Bintliff 2011, 17.

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