New perspectives on querns in neolithic societies
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Session proposal:

Since the time of the first neolithics, cereals were grounded to flour by querns. Together with the domestication and breeding of animals, the cultivation and processing of plants was one of the basis of the new agrarian way of life. However, the concrete exploration of the basic aspects of cereals processing has only emerged in the last fifteen years. The multiplication of studies at a more or less regional scale has purchased new data concerning the circulation of raw materials, the status of the sites and the economy of subsistance. Today, the study of grinding tools contributes largely to our knowlege of neolithic economy and social organization. This session aims at sharing and discussing the new perspectives of such studies on neolithic grinding tools from all over Europe.

The available studies generally integrate a global survey of the grinding tool aspects and their context of discovery (settlements, pits, cemeteries, hoards, etc...). The purchasing and use of raw materials, the form and size of the tools, their technological and even functional characteristics are now better, yet unequally, documented. Despite a large range of local resources (sandstones, basalts, granites, limestones), some rocks were chosen on purpose for grinding activities. Therefore, in some cases the material from other regions was imported. The reasons of these importations may be diverse: cultural, economic, symbolic, etc...

The technological and functional studies of such tools have stressed the surprising complexity of the cycles of reuse and a real diversity in the grinding tasks. New tools and methods of functional identification have been developed in order to make querns speak. The technics of grinding cereals, in terms of gesture and efficiency, have benefited from solid ethnographic comparisons and experimental references. Moreover, the comparisons of the tools and environemental data can help understand the evolution of the grinding technics together with the diet of neolithic populations. Besides, the grinding of diverse plants, of temper or of colourings on neolithic european sites is now admitted and the role of grinding tools in the technical system is more clearly defined.

Recent studies reveal that the status of neolithic querns is not only profane, reduced to domestic use in the households, but also ritual. Querns are often found in funeral ceremonies such as in the Linearbandkeramik cemeteries of central Europe, or in ritual contexts such as the hoards of north-western Europe. A real symbolic seems associated to querns, probably in link with their connection with the diet and the new agricultural economical and social order.
Within this international meeting the uncomplete state of the research on the topic should be discussed. Furthermore, a basis for future research strategies should be developed. Based on querns of the early neolithic, differences in terminology should be pointed out if not clarified. The technological development and function of neolithic querns should also be discussed considering the archeological context. The length and intensity of use of the querns (one generation, one house’s life), the localization of the grinding activities (household or collective grinding areas) as well as the supply of raw material should be investigated by a diachronic comparison including the Early Bronze Age.
Contributions

1. Dragana Antonović (Institute of Archaeology, Serbia - aisanton@yubc.net)
Querns, mortars and grindstones of Neolithic Serbia

Research of Neolithic grindstones, querns and related macrocrystalline stone artifacts in Serbia mostly have been limited to brief notations of presence of this kind of tools sometimes joined with simple description of the objects. Several classes of macrocrystalline abrasive stone tools have been recognized at Neolithic sites in Serbia: querns, mortars, hand abraders and grindstones. They have shown a variety of forms and use wears. Unfortunately, serious research of use wear patterns have never been conducted for these tools, so the definition of the general types were undertaken only according to form and raw material of an artifact, and sometimes according to ethnographic analogy. Querns are supposed to be used in food production, mortars for mineral pulverization (grinding of pigments, ores, ceramic, shells etc.), grindstones in production of stone, bone and wooden tools and hand abraders either in food and production of objects of hard materials (stone, bone, wood, ceramic). Querns and large grindstones are mostly of the similar shape and they have been differing by archaeologists only by raw material. Querns, mortars and all kinds of grindstones, mostly fragmented, were the usual finds at Neolithic sites in Serbia, but their position and distribution within the settlements have not been studied. The beginning of use of querns at the territory of Serbia is noticed at the Mesolithic sites in Iron Gates. Their origin is connected with the sedentary way of life and certainly not with the beginning of agriculture.

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2. A.Ciarico, C.Conati-Barbaro, C.Lemorini, I.M.Muntoni (Dipartimento Scienze Storiche, Archeologiche e Antropologiche dell’Antichità, Università di Roma “La Sapienza”, P.le A.Moro 5, 00185, Rome, Italy - Cristina.Lemorini@uniroma1.it)
The role of grinding tools at Masseria Candelaro (Southern Italy): an integrated approach of raw material, technological, use-wear and residues analysis.

The settlement of Masseria Candelaro is one of the “entrenched villages” that characterise Neolithic of a geographical area in Southern Italy, the so-called "Tavoliere", which is a wide plain bounded by the Adriatic Sea to the east. These villages are organised in one or more defensive ditches enclosing inhabited areas which are partitioned by wide empty spaces. During Middle Neolithic phase II three concentric ditches surround the site. At the end of this phase the ditches are progressively filled up, an evidence which could speak for a loss of their original use. Flint and obsidian industry, pottery, bone or antler objects, heavy duty stones, red ochre and remains of domestic fauna are attested. In the central part of the enclosed area, a structure (Building Q) has been found. The remarkable dimensions of this structure and the lack of post-holes and plaster suggest that this unit has not residential function. Evidence for ritual activities characterises also the building. During Final Middle Neolithic phase III, all the three ditches were used for burial purposes. At this time building Q is still in use but, probably, for different purposes, as the “basins” and the pits are filled up. Flint and obsidian industry, pottery, bone or antler objects, heavy duty stones, red ochre and remains of domestic fauna are attested. About 70 heavy-duty tools have been found in phases II and III. These remains are concentrated in building Q and are represented especially by small grinding tools and pestles.
With the aim of interpreting the socio-economic role of these objects, an interdisciplinary approach has been carried out which includes the study of raw material sources, typological, technological, use-wear and residues analyses.

Bibliography

3. Jan Graefe *(Westfälische Wilhelms-Universität Münster, Historisches Seminar, Abteilung für Ur- und Frühgeschichtliche Archäologie, Germany - jgraefe@uni-muenster.de) Basis of a successful grinding of cereals on querns is the raw material. Only a very limited range of rock types were used as querns. The quality of rocks is related to workability, durability and efficiency. The material has to be tightly cemented and the texture roughed with a fine or middle grain size. In neolithic times sandstones, basalts, granites and limestones were used. The hardness of rocks like sandstones depends on the strength of the matrix (carbonate or silica) which sticks the grains like quartz together. Based on a strong wear during the use, it was sometimes necessary to roughen the surface of the querns using pebbles or hammer stones. Since the geological occurrence of usable material is quite different, in some cases rocks from other regions were imported.

The data of northwestern Germany exhibits that during the neolithic twelve different types of rock were applied. Normally, it was possible to identify the raw material sources, so it is certain that sandstones and granites came to the finding-places from deposits of 5 to 60 km distance. Each region has its typical raw material which is related to the geological occurrence and which is mostly used during the neolithic. Some other types of rock are only once attested as querns.

The procurement of raw material was assured by each settlement itself. There are no differences in form or size of querns between settlements nearby sources and settlements apart. Small flakes of typical raw material from excavated settlements show that the production of querns took place at the houses. It has to be mentioned that the rocks were first examined at the collection point.

The extraction of material for querns must have been done by mining. In some cases only rocks from riverbeds were collected.

4. Caroline Hamon *(UMR 7041 ArScan Protohistoire européenne du CNRS, France - caroline.hamon@mae.u-paris10.fr)*

Technological and functional analysis of Linearbandkeramik grinding tools from northwestern Europe

The study of late Linearbandkeramik and VSG-Blicquy grinding equipment (5300-4600 BC) contributes to the understanding of the socio-economic organisation of the first Neolithic
people from northern France and south Belgium. Grinding tools are generally made of different local sandstones. Despite a great variability of morphology, their dimensions and the stages of their shaping prove that a kind of normalisation has been respected. Three groups of tools can be identified, and may correspond to specific functions.

In order to identify querns’ function, traceological principles have been adapted to macrolithic tools. A first experimental referential has been elaborated, both for grinding and abrading actions. A more accurate vision of cereal processing is now available: dehusking seems to have been practised on stone querns, which explains partially the lack of mortars at that time. This operation has been realised by upper grinding tools of smaller dimensions. This study also demonstrates how querns have been recycled secondarily for temper and even colouring processing, as if querns were included in the technical system for more than their pure domestic and dietary functions.

The correlation of the exact function of a tool, of its stage of maintenance or reuse and of its spatial localization in the danubian house brings new data concerning the life cycle of grindingstone equipments at the beginning of the Neolithic. It brings new arguments to the discussion about the symbolic status of these querns. As suggested by several contexts, grindingstones used to be deposited in graves and, at the end of the danubian culture, in specific hoards associated to the domestic area. It reminds us how strong the identity of these first farmers of Europe was connected to their way of life and production.

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5. Cecilia Lidström Holmberg (PhD candidate, Department of Archaeology and Ancient History, Uppsala, Sweden - cecilia.lidstrom_holmberg@arkeologi.uu.se)

Rites of Separation. Quern tool technologies, social relations and the becoming of the Northernmost TRB.

The presence and recognition of grinding and pounding tools have a long tradition in archaeology. Despite the early attention, ‘ground stone’ objects still belong to a rather neglected category of archaeological artefacts, especially within Scandinavian and North-European archaeology.

This presentation aims to discuss some aspects of quern tool technology, social relations and imageries of gender to the rearticulation of culture shaping the TRB in eastern, central Sweden.

In the first half of the 1900’s, Swedish archaeologists harshly argued over the Mesolithic-Neolithic transition and the introduction of agriculture in eastern central Sweden, a debate of which of some text lines were luckily never taken into the printers. At Stone Age sites in focus of this debate, some rather big artefacts looking like ‘poorly fermented loafs of bread’ were found together with pottery and thin-butted axes of greenstone. The struggle continued – were the ‘loaf-shaped’ artefacts polishing tools or quern tools? Left in the archaeological oblivion for over half a decade, recent technological analyses have positively confirmed that the ‘loafs of bread’ no doubt are flat/saddle querns.

Current research on ‘ground stone’ artefacts at Mesolithic and Neolithic sites in eastern, central Sweden show that the saddle quern design appears in the area at the onset of the early Neolithic (c. 4000-3900 cal. BC), closely connected to a material tradition that archaeologists since the 1940’s have labelled Funnel beaker- or TRB culture. The saddle quern design; which has its closest parallels in the quern tool technology of the LBK, was appreciated, produced, and used by many TRB communities in the area of study. While Mesolithic peoples no doubt processed plant foods and ochre for pigments using grinding and pounding tools, saddle querns does not exist at Mesolithic sites in the area. Close studies of the operational chain involved in the manufacture of quern tools at Mesolithic and early Neolithic sites, however, suggest that the early Neolithic quern technology have roots into the local Mesolithic making of certain axes and polishing tools. The saddle quern design is thus novel for the early Neolithic, while the technology has a local history. From a historical perspective on technology, practice and agency, this technological mix of old and new is, I suggest, a marker for the becoming of
the early Neolithic TRB in the region. The becoming of the TRB thus includes the agency of local hunters and gatherers.

During the mid 1990’s, several early Neolithic TRB sites were rescue-excavated in the area. With a new-fangled interest in ‘ground stone’ technologies, saddle querns were now identified and documented in several special contexts of deposition, of which some will be presented. Over 50 saddle quern slabs and loaf-shaped hand stones of arcosic sandstone and shiny muscovite-rich metavulcanic rock were for example found at the TRB site Skogsmossen. Apart from a house surrounded with Funnel Beaker materials, this site also contained a small fen located some twenty-five meters away from the house. The fen revealed a large amount of TRB materials, which can best be described as sacrificial offerings. Deposition of saddle querns in the fen compared with the spatial abandonment of querns and other artefacts at the living site show that saddle querns were part of practice of separation. What might be embedded in this ritualisation of saddle querns in the early Neolithic TRB? This will be briefly discussed using some ethnographic examples. Taken together, I will argue that the changing materialities and ritualisations of querns at the onset of the early Neolithic contribute with information on social relations and its dynamic role to the historical and cultural process coarsely called the “Neolithisation”.

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6. I. Pavlu (Institute of archaeology, Praha, Tcheck Republic - ip@bylany.com)
Structure of grinding stones between Anatolia and Central Europe

The classification of prehistoric grinding stones is occasionally subdivided into a number of generally morphologically different artefacts with little respect to their use and way of manipulation. There is a proposal of a very general classification of grinding stones for food processing into upper and lower stones, and grinding stones manipulated by two hands or one hand.

To the contrary it is simplifying another morphological classification, which concentrated on the category of stone with dimpels used mainly in the early Neolithic (Wright 1992). This category, commonly occurs in Anatolia during the aceramic period, looses, during the younger Neolithic and Chalcolithic period, its former variability and becomes restricted to mortars and small bowl like stones. At that time lower grinding stones, with defined rectangular working surfaces, also dissapear.

The dimensions of full profiles are distinguished from the dimensions of the fragmented examples. The length and width of the upper stones from the older aceramic period on Aşıklı Hüyük (ca 8300 - 7530 BC) is characterised by a strong linear trend, but the dimensions in the Chalkolithic assemblage from Guvercinkayası (ca 5220 – 4680 BC) do not correlate in any important way. Their entire structure concentrates around middle values. The stone structure from the Neolithic settlement in Bylany on the other hand (ca 5300 - 4500 BC) shows considerably high length values while the correlation is similarly low. The upper stones reflect therefore a certain local continuation as well as cultural differences in the remote regions.

Lower stones are sorted according to their size into shaped, unshaped and massive types. The latest are typical for the older settlement at Aşıklı. Traces of wear on them are usually less evident. The relation between length and width of the lower stones is almost identical in different cultures. The aceramic shapes are larger in average. The structure of Central European grinding stones corresponds in dimensions with the Chalcolithic ones in Anatolia. Bowl like stones occure in small or large versions. Occassionaly it is difficult to distinguish between mortar bowl shaped slabs/anvils. Mortars are usually shaped into quadratic forms or only roughly worked natural shapes; their working surface is a regular circle. They are usually quite high since they soon wear off with use and get deeper. Bowl like stones are lower, often
very small so that they fit into one hand. They were possibly used for grinding small amount of food or of other materials such as herbs or spices.

7. Britta Ramminger (Universität Hamburg, Archäologisches Institut, Germany - Ramminger@em.uni-frankfurt.de)
Neolithic grindingstones in Hessen, Germany: Raw material need and procurement of LBK sites

Querns and whetstones represent together the major part of all stone artifacts in most LBK settlement inventories. For the analysis of stone tools particularly the used raw materials and their origin are of importance apart from technological aspects. A substantial aspect of the economic life in the early Neolithic is seized with the supply of raw materials of an individual site or a region. In Hesse various rock outcrops were used by the early Neolithic population. The distance of used deposits to the settlements and the kind of extraction are decisive for the question of the exploitation and distribution mechanisms.

Information about the demand of querns in the individual settlements are necessary for the evaluation of the raw material quantities and concomitantly the exploitation methods and possible surplus productions. For the Moerlener bay, a 6 x 12 km large micreregion in the northwest Wetterau, central Hesse, the demand of quern raw materials was model-like calculated. Even with maximum grain consumption and high wear by rock abrasion and napping of the work surfaces the need of querns was relatively small.

8. Christina Tsoraki (Department of Archaeology, University of Sheffield, United Kingdom - C.Tsoraki@sheffield.ac.uk)
Exploring the role and meaning of grinding tools in Greek Neolithic societies.

Analysis of ground stone assemblages in the prehistoric Aegean has focused mainly on typological issues without exploring the character of this technological scheme in detail. Furthermore, ground stone and grinding tools in particular have been traditionally regarded as purely utilitarian tools covering everyday practical needs that contrast with fine ware and other rare types of artefacts such as ornaments that carried a ‘social’ meaning (Perlès 1992: 143-4). Thus, of the three exchange systems Perlès envisaged for the Greek Neolithic, grinding tools should be attributed to that for utilitarian products, ‘mainly economic in purpose …free from symbolic connotations’ (Perlès 1992: 149). These suggestions have been made for the Greek Neolithic as a whole, but to date, have not been explored in a more contextualised manner and at the scale of the single site. Large-scale excavation of the flat-extended Late Neolithic site at Makriyalos, N. Greece, yielded an assemblage of ca. 8800 ground stone tools (out of which ca.5000 are upper and lower grinding tools) from a range of contexts including small habitation pits, large ‘borrow pits’ containing debris from possible feasting episodes, and encircling ditches.

Detailed examination of variables such as degree of wear, fragmentation patterns and spatial distribution within different contexts of deposition indicates that grinding tools played a more complex role within Neolithic societies than previously suggested. While they did serve
everyday needs (processing of other materials), they were actively incorporated within symbolic acts contributing to the social reproduction of Neolithic communities.

**Bibliography:**

9. Sue Watts (University of Exeter, United Kingdom - susan.watts@devon.gov.uk)
Object Biography and its importance in furthering our understanding of the structured deposition of querns in Neolithic Britain

It is now widely accepted in archaeological circles that many of the artefacts found on prehistoric sites were not simply discarded, lost or unwontedly abandoned but were deliberately placed in the positions in which they were found for reasons that had meaning to the persons who deposited them. Such artefacts were imbued with symbolic meaning and their patterns of deposition were governed by underlying rules and structures.

This deliberate placement, or structured deposition, of objects, also appears to include querns and it has been highlighted in recent reports that querns are often found whole and sometimes unused, or broken, and placed in a position in which they would not have been used. But why should such seemingly innocuous, utilitarian, practical tools have been considered suitable or worthy of structured deposition? In order to gain a better understanding of this we need to appreciate how they may have functioned within the societies that used them and in order to do this we need to analyse their life history or biography. Querns actually have rather complex biographies. They are long-lived artefacts and their primary use can span several generations. They can also potentially see several phases of secondary use, although it is only their final use which is witnessed in the archaeological record. And throughout their life history querns are enmeshed in a network of associations and relationships between people, other artefacts and the environment.

Although there is plentiful evidence, ethnological, historical and archaeological, to show that querns can function as a tool for grinding a wide variety of products – vegetable, mineral and animal, their importance for grinding staple food stuffs should not be underestimated for in this lies the heart of the quern’s *raison d’être*. The task of grinding such products is a vital, socially meaningful act embodying pragmatic, emotional and symbolic values associated with the quern itself, the physical act of milling, the product being ground and the purpose for which it is being processed. It is these values that are reflected in the structured deposition of querns. The importance of cereals in Neolithic Britain, however, is difficult to assess. Bone isotope analysis has indicated that the Neolithic diet was predominantly based on meat and dairy products and yet there is also evidence for cereal cultivation. It is suggested, therefore, that grain was grown for particular uses, rather than as a regular food supply, and it is these especial uses that are made manifest in the structured deposition of querns on Neolithic sites.