

# Proceedings of the 3rd Meeting of the Association of Ground Stone Tools Research

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# Introduction

## Ground Stone Tools and Past Foodways 3rd Meeting of the Association for Ground Stone Research

The Association of Ground Stone Tool Research (AGSTR) was created in 2015 to promote research into ground stone tools in archaeology to enhance this still emerging field. The association was started by Daniel Rosenberg from the Zinman Institute of Archaeology at the University of Haifa, where he directs the Laboratory for Ground Stone Tools Research. The first meeting of the association was held in July of 2015 in Haifa at the Zinman Institute. After a successful and stimulating conference, a second meeting was arranged, this time in Mainz in September of 2017, hosted by Johannes Gutenberg University. Both were well-attended, with more than 50 participants each, and brought together specialists and experts in ground stone from across the world, working in and on material from East Asia, Africa, North America, Europe, Australia, Southwest Asia and beyond.

The third meeting of the AGSTR, was held in Copenhagen in September 2019, and focused on ground stone tools and their role in past food procurement, processing and consumption. The tag-line proclaimed the theme: “*Ground Stone Tools and Past Foodways*”. The Centre for the study of Early Agricultural Studies (CSEAS) co-hosted the conference with the SAXO-institute of History, Archeology and Ethnology at the University of Copenhagen.

This conference, and the two preceding it, were held at a time when the interest in ground stone tool studies and their potential was growing. After decades of being an artefact category taken less seriously by archaeologists, ground stone studies now appear frequently in archaeological journals and publications from sites across the world, as a select sample of studies from the last 24 months shows (e.g. Bajeot *et al.* 2020; Chondrou *et al.* 2021; Dietrich and Haibt 2020; Hamon *et al.* 2021; Hruby *et al.* 2021; Li *et al.* 2020a; Li *et al.* 2020b; Santiago-Marrero *et al.* 2021; Zupancich and Cristiani 2020). The surge in interest and publications is largely driven by the application of new approaches, mainly: residue analysis, microscopic use-wear, 3D scanning and quantitative wear data, along with related experimental studies.

The successful extraction of microbotanical remains and residues from tool surfaces, in particular phytoliths and starches, has contributed greatly to our understanding of what was processed with these tools (e.g. Aranguren *et al.* 2015; Fullagar *et al.* 2006; Fullagar and Wallis 2014; Hamon *et al.* 2021; Li *et al.* 2020b; Mariotti Lippi *et al.* 2015; Nadel *et al.* 2012; Pearsall *et al.* 2004; del Pilar Babot and Apella 2002; Portillo *et al.* 2013; Power *et al.* 2016; Santiago-Marrero *et al.* 2021; Yang *et al.* 2013; Zupancich *et al.* 2019). In addition to, or in combination with these analyses, studies conducting (microscopic) use-wear analysis of ground stone, using both qualitative (Adams *et al.* 2009; Adams 2014; Adams *et al.* 2015; Delgado-Raack and Risch 2009, 2016; Laure Dubreuil *et al.* 2015; Dubreuil and Grosman 2013; Dubreuil and Plisson 2010; Revedin *et al.* 2018) and quantitative (including 3D) methods, often in conjunction (Bofill 2012; Caricola *et al.* 2018; Cristiani and Zupancich 2021; Dietrich and Haibt 2020; Zupancich and Cristiani 2020; Zupancich *et al.* 2019; Chondrou *et al.* 2021; Martinez *et al.* 2013; Benito-Calvo *et al.* 2018) have documented a wide range of contact materials. The application of these approaches on material from a wider variety of regions and time periods, has also been the deciding factor behind the growth of the field and the unprecedented attention ground stone tools are now receiving.



Not only limited to these methods, several new ethnoarchaeological studies have also appeared in recent years, which have shown the potential of ethnoarchaeology to inform our understanding of ground stone artefacts, especially with regards to the study of past foodways and the technological choices of practitioners engaged in “traditional” food processing (Alonso 2019; Hamon and Le Gall 2013; Nixon-Darcus and D’Andrea 2017; Robitaille 2016; Searcy 2011; Shoemaker *et al.* 2017).

The volume here thus contributes to this growing field within archaeology. It presents a selection of papers from that 3rd meeting of the Association of Ground Stone Tool Research. Though having a particular focus on “Ground Stone Tools and Past Foodways”, the volume also includes contributions dealing with sourcing, technology, use-wear and residue analyses and other aspects of the study of ground stone tools, such as ethnoarchaeology. Geographically, the papers cover a wide geographic range from Western Asia, Central Asia, Europe and Africa, and periods from the Palaeolithic to the present day.

By focusing on food, we wished to explore how ground stone analysts can approach ancient foodways through ground stone, using new methods and approaches. Foodways, explores the myriad of activities, people and tools involved in the procurement, processing, consumption and discard of food, and how these activities are situated within a web of social, material and ecological relations. Ground stone tools played a huge role in these activities up until the recent past and still in some regions of the world today. As research within and beyond these proceedings show, there is immense knowledge about foodways to be gained from studying ground stone tools. It may allow us to recognise different products being produced, and ways of producing them, what resources were being exploited, including resources that challenge our traditional understanding of what was processed with these tools.

This volume is structured chronologically, starting with the earliest material, the Upper Palaeolithic, though not discriminating between geographic locations. Studies explicitly dealing with foodways are thus interspersed with studies that also deal with other economic and social aspects of ground stone technology. This hopefully provides the reader with a broad range of insights that go beyond a strict adherence to foodways studies. This is done purposely, as we feel it important to consider the complex webs of meaning and structures these tools would have been entangled in. As the “foodways” approach also highlights, food production does not happen in isolation, but in conjunction with other activities, tools, tasks and people (Graff 2018; Hastorf 2017).

Ground stone technology and past foodways in pre-agricultural societies are explored in both Revedin *et al.* and Pedersen (Chapters 1 and 2 respectively). Revedin and colleagues focus on the production of flour in the Upper Palaeolithic Gravettian of Europe, through experiments in processing *typha* and oats, along with trace residues on the surface of archaeological stone implements, argue for the importance of starch rich foods for Palaeolithic foragers. Pedersen, by applying a *gesture*-based analysis of two assemblages from eastern Jordan, explores technological traditions and change within food processing ground stone among foragers in the late Pleistocene and early Holocene (Natufian to early Neolithic periods) of Southwest Asia. Cagnato and colleagues, like Revedin *et al.*, also look at plant food processing in Europe, though from a Neolithic perspective. They also conduct experiments in processing cereals and pulses, and through residue analysis examine how starch grains are affected by processing and by taphonomic processes.

A specific focus on consumption, discards and deposition of food processing ground stone is found in Chondrou & Valamoti and Bekiaris and colleagues, both dealing with evidence from the late Neolithic and Bronze age in Greece respectively. While, Bekiaris *et al.* stresses the importance of more intensive and extensive studies of ground stone assemblages and technology of the Bronze Age in Greece, Chondrou & Valamoti examine the spatial organisation of tool use and daily life activities in the Late Neolithic.



Additional studies of Neolithic assemblages are found in Vučković, Orijiemie and Dubreuil *et al.* Vučković sheds important light on ground stone use in the central Balkans. Dubreuil *et al.* finds evidence of plant processing in the Gobi desert from microscopic use-wear analysis. Non-food tools, felling or ceremonial tools, and their social importance is explored by Orijiemie looking at ground stone axes of the Late Stone Age, in Africa. Another example of a tool not directly involved in food processing, but rather tilling (plant tending), is found in Robitaille, who examines digging sticks weighted by special perforated ground stone, so-called *nougouil*, in Ethiopia and their Late Stone Age origin in Africa.

Alexandrovsky and colleagues provides a view of a unique assemblage of ground stone vessels and other artefacts from underground chambers at the late Chalcolithic site Tsomet Shoket in the Levant. Another unique assemblage from the Levant is of bedrock features high up in mountain caves of the Judean desert, which may have served as refugiums for people in the Late Chalcolithic, is presented in Davidovich. Lisowska presents an excellently discrete example of medieval foodways and the biography of buildings, through a (micro-archaeological) study of a baker's house from Wrocław, Poland. Verbrugge then surveys the history, manufacture and trade of stone mortars in Northern and Western Europe, from the Iron Age and into the medieval period and their role in medicinal practices. Nixon-Darcus shows the usefulness of ethnoarchaeological studies of technological practices and how these may inform our archaeological interpretation. By working with modern operators of food processing grinding tools in Northern Ethiopia, it shows how these practitioners consciously engage with the raw material of their tools, maintaining differently textured grinding surfaces for specific end-products.

It appears as if there are exciting times ahead for the field of ground stone studies. We hope that this volume will spark the interest of fellow experts within the field and within the broader field of stone tool studies, and of scholars of past societies, economies and foodways generally. The chapters within, will provide some interesting points for future discussions.

Patrick Pedersen, Anne Jörgensen-Lindahl, Mikkel Sørensen, Tobias Richter, Copenhagen 2021

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