This book is dedicated to the memory of Prof. Dr. Nur Balkan-Ath (2nd January 1953 - 10th April 2019).
Contents

Authors ........................................................................................................................................................................................ ii

Foreword ....................................................................................................................................................................................... v
Mehmet Özdoğan

Connecting Lithics: An Introduction to Lithic Studies in Anatolia and Beyond ................................................................. 1
Adnan Baysal

Raw Material Matters ................................................................................................................................................................. 11
Elizabeth Healey

Use-wear Analysis of Lithic Tools: Technical Processes and Cultural Developments in Anatolia .............................. 50
Laurence Astruc

The Projectile Points of Neolithic Çatalhöyük: A Contextual Multi-Attribute Analysis ...................................................... 58
Lilian Dogiama

The Importance of Lithics in Determining the Economic Models and Lifestyles of Prehistoric Societies: The Kanlıtaş Höyük Example ........................................................................................................... 73
Neyir Kolankaya-Bostancı

The Lithic Assemblage of Suluin Cave in Antalya (sw Anatolia) ..................................................................................... 86
Zehra Fürüzen Taşkıran and Harun Taşkıran

Lithic Assemblages from the Marmara Region: 7th -3rd mill. BC .................................................................................... 110
Ivan Gatsov and Petranke Nedelcheva

Yeşilova Höyük Neolithic Period Chipped Stone Industry ................................................................................................. 122
Betül Fındık and Zafer Derin

The Techno-Typology of The Projectile Points of the Neolithic Settlement of Ege Gübre (Izmir/Turkey) .................. 131
Eşref Erbil

Interpreting Chipped Stone Assemblages of the Neolithic in Western Anatolia – A Conceptual View ............................ 139
Bogdana Milić

Looking West: Central Anatolian Obsidian in the Western Anatolian Peninsula and Eastern Aegean ...................... 150
Marina Milić

Viewing Melian Neolithic Obsidian Networks from the Western Side of the Aegean sea (Greece): Distribution Parameters and Data Reconsidered ................................................................. 164
Lia Karimali and Stella Papadopoulou

Stone Technology Under the Microscope: the Contribution of Microwear Analysis of Ground Stone Tools to the Understanding of Daily Activities ................................................................. 213
Christina Tsoraki

On the Function and Ethnographic Analogies of North East Aegean Ground Stone Tools ........................................... 225
Abdulkadir Özdemir and A. Onur Bamyacı

General Assessment of the Ground Stone Industries of the Marmara Region ................................................................. 237
Emre Güldoğan

So Close, Yet So Far Away: the Ground Stone Tool Assemblages from the Two Neighbouring Settlements of Kleitos, North-western Greece ...................................................................................... 247
Danai Chondrou

Abrasive Stone Tools in the Neolithic of Serbia: from Recognition to Publication ................................................................. 265
Dragana Antonović and Vidan Dimić
Abdülkadir Özdemir

Abdülkadir Özdemir received his M.A. and PhD. degree from Onsekiz Mart University (Çanakkale/Turkey) and currently works at the department of archaeology at Fırat/Euphrates University (Elazığ/Turkey). His interest and specialized focus is the archaeology of the Neolithic, Chalcolithic and Early Bronze Ages of western Anatolia. He has contributed to the excavation project of the Chalcolithic settlements of Gülünar at the Greco-Roman sanctuary of Smintheion in northwest Anatolia and surveyed at the nearby Neolithic site of Coşkuntepe between 2004 and 2005. He has also recently been engaged in the Excavation of the Urartian site of Murat Tepe in eastern Anatolia.

Adnan Baysal

Adnan Baysal specializes in the Anatolian Neolithic and has worked extensively on the social and economic implications of ground stone assemblages from Çatalhöyük and other contemporary Central Anatolia sites. He is currently lecturing and conducting his research in the Archaeology Department at Ankara University.

Betül Fındık

Betül Fındık completed her undergraduate education at the Archaeology Department of Ankara University. She studied the Yeşilova Höyük Neolithic chipped stone industry as her doctoral thesis and received her PhD degree from Ankara University. She is currently employed in the Archaeology Department of Mehmet Akif Ersoy University, Burdur/Turkey.

Bogdana Milić

Bogdana Milić works on chipped stone assemblages in the process of Neolithisation in western Anatolia, the Near East (Zagros region, Iran), northern Greece and central Balkans (Serbia). Her BA and MA studies were completed in 2011 and 2012 respectively at the Department of Archaeology, Belgrade University. She held a scholarship from the EU commission at the Institute for Pre- and Protohistory and Near Eastern Archaeology at Ruprecht-Karls University Heidelberg (2011). Her PhD studies were completed at the Eberhard Karls University Tübingen in 2018. Between 2012–2016 she was a researcher at the Department of Prehistory, Istanbul University on the ‘BEAN’ project, a Marie Curie Initial Training Network Theme of the EU Commission’s FP7 programme. Meanwhile she was a guest researcher on the ERC project ‘Prehistoric Anatolia’ initially based at the Austrian Archaeological Institute, and later at the OREA institute. Since 2016 she has been a researcher at the Institute for Oriental and European Archaeology (OREA) at the Austrian Academy of Sciences.

Christina Tsoraki

Christina Tsoraki specialises in prehistoric archaeology with a focus on material culture studies, lithic technology and microwear analysis. Her research interests include depositional practices, cross-craft interactions, object biographies and household archaeology. She is involved as a specialist researcher (specialising in ground stone technology) in many archaeological projects in Greece, Cyprus and Turkey ranging in date from the Early Neolithic to the Hellenistic period. Between 2012-2018 she was the leader of the Ground Stone Team for the Çatalhöyük Research Project (Turkey) directed by Prof. I. Hodder (Stanford University, USA).

Danai Chondrou

Danai Chondrou is currently a PostDoc Researcher in the Plantcult ERC project hosted by the Aristotle University of Thessaloniki, Greece. Her main research interest lies in ground stone tool technology and its social, economic, cultural dimensions that can help explore the structure and evolution of past societies and the way people perceived and manipulated their world. Her work focuses on the macroscopic and use-wear analysis of stone tools, combined with experimental explorations and spatial analysis.

Dragana Antonović

Dragana Antonović completed a degree in archaeology at the Faculty of Philosophy, University of Belgrade and received her Ph.D. from the same University in 1998. She is a Principal Research Fellow at the Institute of Archaeology in Belgrade. The main areas of her research are raw materials for prehistoric ground stone implements (identification, procurement, production of tools, exchange), use-wear analysis and technology of production of ground stone implements, the beginnings of metallurgy in the Balkans (copper mines, copper tools – typology and technology of production) and prehistoric mining in Serbia. She has conducted archaeological field work at a number of Neolithic and Eneolithic sites in Serbia, has participated in several international and national research projects, published four books and more than 100 papers.
Elizabeth Healey

Elizabeth Healey has spent her archaeological career working with stone tools in the UK and latterly in the Near East, especially Turkey. Much of her work is concerned with investigating choices of raw materials and how they were obtained and used. She is particularly interested in provenancing obsidian and interpreting its distribution.

Emre Güldoğan

Emre Güldoğan studied ground stone artifacts of Aşıklı Höyük as his MA thesis topic then completed his PhD, ‘Origin and Distribution of the Comb-Printed ‘Impresso’ Pottery of Mezraa-Teleilat’, in 2008 at Istanbul University. He has contributed to numerous projects in the Marmara Region through his career before finally establishing his archaeological exploration project in and around Istanbul (İstYA). Güldoğan is currently a member of Prehistory Section of the Archaeology Department at Istanbul University.

Eşref Erbil

Eşref Erbil completed his undergraduate and MA degrees in the Department of Prehistoric Archaeology at Ankara University and he is currently a PhD candidate in the same department. His research focus is on Paleolithic and Neolithic knapped stone techno-typologies. He has taken part in various excavations and research projects including Karain Cave Excavations (2005-2019), Suluin Cave Excavation (2007-2014), Uşak Province Banaz District Sürmecik Paleolithic Age Excavation (2016-2017), Sakarya Province Prehistoric Archaeology Survey (2013-2016), Eskişehir Province Prehistoric Archaeology Survey (2017) and Kızılin Project (2017-2019).

Harun Taşkıran

Harun Taşkıran is Professor of Prehistoric Archaeology at the Department of Archaeology, Ankara University. His research concentrates on Quaternary Archaeology in Anatolia, especially Lower and Middle Palaeolithic lithic assemblages. He conducted Palaeolithic surveys in the area of Karkamış and the Ilısu Dam Lake. He also directed the excavations at Suluin Cave, Antalya. He currently directs the archaeological excavations of Karain Cave, location of the most important Palaeolithic cave settlement known in Turkey. He has published over 100 articles, many of them presented at international and national congresses and meetings.

Ivan Gatsov

Professor Ivan Gatsov is a lecturer in Archaeology at New Bulgarian University whose main focus of study is the Lithic assemblages in the South Balkans, Marmara Sea and Caucasus regions during Late Prehistory. Over the last decades he has published many articles concerning the development of chipped stone technologies in the above mentioned areas.

Laurence Astruc

Laurence Astruc is a CNRS researcher specializing in the Eastern Mediterranean and Middle East. Her research is focused on the lithic industries of villages and she is interested in using technology to identify the organisation of subsistence activities, craftsmanship within the communities, know-how, technical specialisations, and ancient exchange networks. She makes contemporary and diachronic comparisons of toolkits to identify the local and exogenous dynamics and the development of cultural identities.

Lia Karimali

Lia Karimali is a prehistoric archaeologist (Ph.D. Boston University), with specialization in lithic technology. She has been an external researcher at FORTH. She has studied and published several articles on Aegean and Mediterranean lithic collections (Platia Magoula Zarkou, Orgozinos, Pefkakia and other Neolithic Thessalian sites; Faximadi Peninsula, Euboea; Halai, Lokris).

Lilian Dogiama

Lilian Dogiama received her PhD in Anthropology from McMaster University. Her thesis explored the role of hunting in the Neolithic community of Çatalhöyük. She also has a Master’s in Prehistoric Archaeology from the Aristotle University of Thessaloniki and a Bachelor’s in Archaeology and History of Art from the National and Capodistrian University in Athens. She specializes in stone tool technology in the Neolithic and Bronze Age of the Eastern Mediterranean and was the recipient of a Wenner-Gren Dissertation Fieldwork Grant for her work at Çatalhöyük, Turkey. She has participated in numerous excavation projects in Greece and Turkey spanning from the Palaeolithic to the Early Byzantine period. Lately, she has been applying her academic expertise to the publishing industry, working as an editor at Cambridge University Press, UK.

Marina Milić

Marina Milić is currently an Irish Research Council Postdoctoral Fellow at School of Archaeology, University College Dublin, exploring Neolithic – Eneolithic transformations in the Balkans during the 5th millennium BC. Previously, she spent over 15 years working on chipped stone assemblages from Neolithic sites in Turkey, Greece and Serbia. During this research she focused on the sourcing and technology of obsidian
artefacts as a means to understand aspects of interaction and connectivity between communities from the local to regional scale throughout the Neolithic period.

Neyir Kolankaya-Bostancı

Neyir Kolankaya-Bostancı completed her undergraduate degree at Ankara University, Prehistory Department in 1995. She received her MA and PhD degrees from Hacettepe University, Department of Archaeology. She worked as a Research Assistant between 1998-2009, as an Assistant Professor between 2009-2018 and as Associate Professor since 2018 in the same department. She works as a lithic expert in various excavations and surveys. In addition she has researched Neolithic, Chalcolithic and Bronze Age chipped stone industries, obsidian exchange and trade systems, Palaeolithic art and symbolism.

Onur Bamyacı

Onur Bamyacı accomplished his PhD in Archaeology at Çanakkale Onsekiz Mart University in 2017. He holds the position of Assistant Professor at the same university. He has recently been working on the analysis of the ground stone assemblages of Western Anatolian prehistoric settlements and contributes to excavations as a ground stone specialist in Turkey. His other interest areas are Aegean archaeology, prehistoric economy and ethnoarchaeology.

Petranka Nadelcheva

Petranka Nadelcheva is an Assistant Director at the National Museum of History of Bulgaria and Assistant Professor of Archaeology at New Bulgarian University. She specialized on topics related to Neolithic, Chalcolithic and Bronze Age lithic technologies in the Northern Aegean, Anatolia and Caucasus.

Stella Papadopoulou

Stella Papadopoulou completed her PhD in Prehistoric Archaeology titled ‘Chipped stone industries from western Macedonia, Greece. The case of the Neolithic lakeside settlement Anarghiri IXb’ in 2020 at the Institute of Archaeological Sciences, University of Bern. She is a highly experienced field archaeologist who has extensively contributed to excavation projects of Neolithic settlements in Greece. She is currently conducting analytical research on chipped stone artefacts from various sites in Greece.

Vidan Dimić

Vidan Dimić finished elementary and master studies at the Faculty of Philosophy in Belgrade, Department of Archaeology. From the beginning of his studies he was interested in prehistoric periods, with a main focus on the Neolithic of the Central Balkans. At the end of the basic and during the master studies, the main focus of his research was archaeo-technology and the study of polished and abrasive stone tools. This interest has been extended to the exploration and understanding of the ‘chaîne opératoire’ from the exploitation of raw materials, through the production of artifacts, their use, repair, damage and discard. The knowledge and experiences that came from these studies have led him to choose experimental archaeology as the main topic of his PhD studies. Although the PhD topic is closely related to polished stone tools with a cutting edge, he previously had the opportunity to work on several projects with other materials such as bone and antler. Vidan is employed at the Archaeological Institute in Belgrade as a Research Associate. So far, he has published several works related to ground stone industries, abrasive stone tools, terminology in stone technology studies, use wear analyses, prehistoric copper mining technology, experiments with prehistoric sickles both individually and as part of a team.

Zafer Derin

Zafer Derin studied archaeology and graduated from Atatürk University in 1979. He pursued his archaeological career and completed his MA degree in 1983 and PhD degree in 1986. He currently works in the Department of Archaeology at Ege University (İzmir/Turkey). During his academic career he has participated in numerous archaeological projects and since 2005 has conducted the Yeşilova Höyük Excavations in İzmir/Turkey. He has published widely and is also the founder and curator of the Yeşilova Höyük Visitor Centre.

Zehra F. Taşkıran

Zehra F. Taşkıran graduated from the Department of Prehistory of Ankara University in 1983. In 1993, she received her master’s degree with her thesis on ‘Techno-typological Analysis of Öküzini Cave cores’. She completed her PhD with her thesis on ‘Holocene Period Chipped Stone Industry of Suluin Cave’ in 2014. She has worked at numerous archaeological excavations and surveys conducted in Turkey. She also has expertise in drawing chipped stone tools. She has contributed to the Palaeolithic, Neolithic and Chalcolithic chapters in the children’s book, ‘Anatolia Before You’, prepared by the Directorate of the Museum of Anatolian Civilizations.
The present volume, bringing together a fine selection of papers, is a most welcome contribution to lithic studies, covering not only chipped stone but also fine and coarse groundstone assemblages. In the historic development of archaeology the main concern in the study of artefactual assemblages has conventionally been based on typology and style with little concern either about the procurement or the characterisation of raw materials. Likewise, concern about technology had remained more or less in the domain of Palaeolithic and metallurgical studies. Colleagues working on other artefacts, either pottery or other materials, hardly showed any interest in the technologies employed in production. In this respect, groundstone artefacts, though being the most iconic tool of food-producing economies of later prehistory, were habitually overlooked, never mind any concern about the technology of their production, there was not even any available comprehensive typology of these tools; indeed, not many excavations bothered to collect them. Here, it is worth stressing that the editor of this volume was one of the first, at least in Turkey, to develop an interest in groundstone artefactual assemblages during the early years of his career, soon to play a leading role in promoting such undertakings. We are aware of the fact that it would be totally incomprehensible to the present generation of young scholars, now intent to recover every item coming out of the soil, to disregard a group of artefacts just because they don’t have the visual appeal of other finds; that is why we consider it necessary to take a look in retrospect at the years when young Baysal developed an interest in groundstones, to narrate why dealing with an unappealing assemblage sounded so unusual at that time.

Many years ago, during late 1970s when our work at Çayönü was at its peak, we were faced with the serious problem of classifying, sorting, analysing and describing the finds. At that time Çayönü was the only Pre-Pottery Neolithic site under excavation in Turkey, and as the site was of the Pre-Pottery horizon, most of what we were encountering consisted of bone, chipped stone and groundstone. Çayönü was a joint project of our department in full collaboration with the Chicago Oriental Institute. There were several experts who came with the Braidwoods to work on chipped stone and the bones. What was being done – the sorting and analysing chipped stone, bone artefacts and faunal remains – had appealed to our students, and they began volunteering to work with the guest experts, laying the foundations of present-day Turkish specialists in fauna, bone artefacts and chipped stone. However, we still had the problem of the groundstones – there were hundreds of them displaying a wide variety of shapes and of raw materials. None of us even considered being engaged, Braidwood’s team was also of no help, the only solution we devised was to label them by noting their find spots and then to put them on to the shelves of the excavation house, giving a few nice-looking ones to the museum. Through time the problem became more and more acute, we had to construct and add a new storeroom to the excavation house just to find a place for the steadily increasing number of groundstones. Finally, Michael Davis, one of our collaborators, and an ex-student of the Braidwood’s, took the initiative to study and to catalogue our groundstone assemblage, and though we were all very appreciative it was still considered as rather a peculiarity. He had no possibility at that time to get any help from anyone in the team either in categorizing or in assessing; he developed his approach by consulting other colleagues working in the southern Levant. For some time, his work stood as an exemplar in groundstone studies. Not too long ago, only 30–40 years previously, we could not envisage that one day there would be so many lithic experts working and publishing, as best displayed in this volume.

The diversity of approaches covered by this volume, both on chipped and on groundstone assemblages, is worth noting, some going beyond the state of the art. Even a brief survey of the papers thus presented provides an insight into the current state of research, exemplifying the outstanding dynamics of research and the employment of new analytic technologies in the study of lithic artefacts. In this respect, the amazing advancement that took place within a few decades on sourcing and characterization of various raw materials is worth remembering. It was only in 1963 that pioneering work took place in the characterization of obsidian in North America, making it possible to determine the source volcanism of obsidian artefacts, and which a year later was implemented on Anatolian obsidians, though with considerable uncertainties. Soon after, with the advances taking place in methods in analysing raw materials, including optical spectrometry and
fission track, enabling more precise sourcing providing ample information that would not have been possible to dream of, our way of looking to the modalities of raw material procurement were revolutionised. Since then methods in defining particularities of raw materials, running from isotopic studies to geochemistry have been consistently developing, making possible new trajectories of research enabling us to look at materials with different approaches. While it is becoming possible to obtain much more precise data on technology, function and raw material characterization, each becoming a specialized field of research, at the same time we are also now developing a holistic approach considering all of these entities in relation with each other. What we were able to surmise previously about prehistoric trade being a unidirectional and simple mechanism has had to be considerably modified, as now at least we are aware of the complexity of past trading systems, even during prehistoric times.

In considering the contexts of some of the papers presented in this volume, I find it necessary to touch on the changing trajectories in the quest for defining the function of tools. In earlier years, the most convenient modality in guessing the function of lithic artefacts was, more or less, simple comparisons based on ethnographic documentation, which did not always reveal very convincing solutions. Even though there had always been some experiments with models to study the usage of tools, they were mostly sporadic efforts. The English translation of Semenov’s ground-breaking book in 1970, stirring considerable excitement, had stimulated a generation to detect the technologies employed in shaping, use-wear and experimentation, also given rise by the advancements in micro-photography. Within a decade or so, distinct fields of specialization including experimental archaeology, ethnoarchaeology, use-wear analysis, technology and residue analysis became fully established, each becoming a distinct field of research and developing their particular modalities and terminologies. As featured in some of the papers in this volume, we are just beginning to understand the importance of the boundaries among different raw materials, particularly in considering the types of stone tools to be employed in shaping other raw materials, such as in the making of bone or horn tools.

Thus far we have tried to present a conspectus on the advancements taking place in the study of lithics, particularly pointing to the modalities brought by multidisciplinary practices, revolutionizing what we can learn from the procurement of raw materials to shaping and usage. However, it should still not be overlooked that archaeology is a social science bound by behaviour, thus necessitating an understanding of the process. Interdisciplinary studies providing detailed, precise data enabling accurate descriptions, still have to be considered as a tool and not as the eventual end in assessing archaeological materials. In this respect it should not be overlooked that even devising a simple typological chart necessitates taking arbitrary decisions that are solely bound by accumulated knowledge. To exemplify – if we want to sort an assemblage into two categories, small and big, setting the dividing line necessitates an arbitrary decision, which would reflect accumulated knowledge and insight of the researcher. Accordingly, the success of the categorization is defined by deciding on befitting criteria. Here, I want to conclude by stressing that in archaeology, as for all social sciences, to sort, to classify or even to generalize depends on being able to take correct decisions in assessing when all criteria are relative and this is bound by developing a mutual understanding of the materials. That is exactly why such works as this volume are a necessity.